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RESEARCH ARTICLE

A Study on Relationship between Composition of Milk and Yield of Paneer Prepared under Different Coagulation Temperatures.

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ABSTRACT

Paneer, popularly known as Indian cottage cheese is prepared by heat-cum-acid coagulation of standardized buffalo milk. In the present investigation, buffalo milk paneer was prepared under different coagulation temperatures to compare the yield, moisture content and whey drained from the prepared paneer. Also a correlational study was done between chemical constituents of milk viz. fat, SNF and total solids percent and yield of prepared paneer.It was concluded that the highest yield of paneer was obtained at coagulation temperature of 75^{o}C with optimum moisture percentage. From the study it was also inferred that when milk was coagulated at 85^{o}C and 70^{o}C the yield was more influenced by fat but when milk was coagulated at 80^{o}C and 75^{o}C, SNF had got a significant effect on the yield of paneer. At 90^{o}C and boiling temperature both fat and SNF had got a significant effect on the yield of paneer.

Key words: coagulated milk products, heat treatment of milk milk solids, paneer, whey.

INTRODUCTION

Majority of Indian being vegetarians; milk plays a pivotal role in Indian diet. The major portion of milk produced in India is consumed in the liquid form and the remaining is used to prepare value added products. Paneer, popularly known as Indian cottage cheese is prepared by heat-cum-acid coagulation of standardized buffalo milk (6%-Fat, 9%-SNF)[1]. About 5 % of milk produced in India is converted into Paneer [3].The estimated market (traditional and organized sectors) of paneer in 2002-03 was worth Rs. 21 crores and its production was 4,496 metric tones in 2004 [6]. Paneer contains approximately 53%-55% moisture, 23%-25% fat, 17%-18% proteins, 2%-2.5% lactose, and 1.5%-2.0% minerals [7]. For manufacturing good quality paneer with desirable properties, buffalo milk is considered more suitable than cow milk, as the later yields an inferior product in terms of body and texture [12]. Pruthi and Koul (1989)[10] were of the view that paneer prepared from milk testing 3.7% fat or more would meet the PFA (Prevention of Food Adulteration Act) standards. Chemical quality of raw milk and optimum heat treatment has got a significant role in production of good quality paneer. The availability of paneer on the Kerala market is limited due to relatively short shelf-life and poor product yield due to reduced quality of available milk. In the present investigation, buffalo milk paneer was prepared under different coagulation temperatures to compare the yield, moisture content and whey drained from the prepared paneer. Also a correlational study was done between chemical constituents of milk viz. fat, SNF and total solids percent and yield of prepared paneer.

MATERIALS AND METHODS

The study was carried out at University Dairy Plant, Kerala Veterinary and Animal Sciences University, Thrissur, Kerala State. Buffalo milk procured from University Livestock Farm, was utilized for the study.

Chemical composition of milk

The fat percent of raw milk was determined by Gerber's method (ISI. 1958) [5] and Total solids percentage of the milk was determined by drying milk in hot air oven. Solids Not Fat (SNF) percent was calculated.

Heat treatment of milk and acid coagulation

The direct acidification process as per Chandan (2007b) [4] was used.

1) Milk was heated in a stainless steel kettle with automatic stirrer to boiling temperature and coagulated with citric acid at the same temperature.
2) Milk was heated to 90°C and coagulated at 90°C
3) Milk was heated to 90°C and coagulated at 85°C
4) Milk was heated to 90°C and coagulated at 80°C
5) Milk was heated to 90°C and coagulated at 75°C
6) Milk was heated to 90°C and coagulated at 70°C

One percent citric acid solution at the rate of 2.5 gm per kg of milk was used for coagulation. In all the trials the temperature of citric acid solution was the same as the temperature of milk at the time of coagulation. Citric acid solution was added with constant stirring till the completion of coagulation.

Settling of curd and pressure application

Curd was allowed to settle for 5 min. The whey was drained with a muslin cloth. The coagulated mass was collected and filled in hoops (12 X12X7 inches) lined with muslin cloth. The curd was then molded and pressed for 1 hour at room temperature. Pressure was applied on the top of the hoop by placing weight [8]. The pressed paneer was then

removed from the hoops and was immersed in chilled water (4^0C-6^0C) for 1 hour. The pieces of chilled paneer were then removed from water and placed on wooden planks for about 10-15 min to allow loose water to drain. The paneer was weighed and stored at 4°C for further evaluation. Total volume of whey drained was recorded. Eight trials were done for each coagulation temperature.

RESULTS AND DISCUSSION

The pH of whey ranged from 5.5 - 6. There was no significant difference between the average fat percent, average SNF percent and average total solids percent of raw milk taken for different trails. High ($P \leq 0.05$) yield of paneer was obtained at coagulation temperatures of 80°C or lower compared to boiling temperature and 90°C (Table 1). Many researchers had tried different temperatures for heat treatment of milk for paneer preparation. According to Bhattacharya et al., (1971)[2] good quality paneer could be obtained by heating milk to 82°C while Muller et al., (1967) [9]were of the view that heat treatment of milk at 90°C for 10 to 15 minutes is necessary to get satisfactory yield. Here for all the trials we had heated the milk to 90°C before coagulating at different temperatures. Highest yield was obtained at coagulation temperature of 75°C (Table 1) while Rao et al., (1984) [11] reported that higher yield of paneer was obtained at coagulation temperature of 70°C. According to Chandan, (2007a)[3] the yield of paneer is dependent on the fat and solids not fat content of the starting milk and the moisture, fat and protein retained in paneer. In the present study, moisture percent of paneer was higher ($P \leq 0.05$) at coagulation temperatures of 85°C or below. The highest moisture percentage being at 75°C. According to Prevention of Food Adulteration Act, 1955 (amended up to March 3, 2006) paneer or chhana shall not contain more than 70% moisture. In this study, the moisture percent of paneer was in the range 39.87 – 50.87% and whey drained was in the range 0.84 – 0.90L per litre of milk. Whey obtained was higher when coagulation temperatures were 85°C and 90°C compared to others.

The correlation analysis of chemical constituents of raw milk to the yield of paneer (Table 2) revealed that there was significant correlation between total solids and yields of paneer at all the coagulation temperatures. Fat percent of milk showed a higher correlation with yield of paneer at all coagulation temperatures except 75°C and 80°C and SNF showed a higher correlation with yield of paneer at all coagulation temperatures except 70°C and 85°C while fat as well as SNF gave a higher correlation at coagulation temperatures of 90°C and boiling temperature.

CONCLUSION

It was concluded that the highest yield of paneer was obtained at coagulation temperature of 75°C with optimum moisture percentage. From the study it was inferred that when milk was coagulated at 85°C and 70°C the yield was more influenced by fat but when milk was coagulated at 80°C and 75°C, SNF had got a significant effect on the yield of paneer. At 90°C and boiling temperature both fat and SNF had got a significant effect on the yield of paneer.

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Table 1. Quality attributes of raw milk and paneer.

	Coagulation temperature					
	Boiling Temperature	**90°C**	**85°C**	**80°C**	**75°C**	**70°C**
Fat % of milk	7.39±0.64	7.67±0.12	7.92±0.11	7.83±0.24	7.54±0.29	7.75±0.55
SNF % of milk	8.71±0.81	9.37±0.53	10.08±0.49	9.04±0.08	9.65±0.33	8.89±0.24
Total solids % of milk	16.02±1.5	17.05±0.44	17.78±0.63	16.87±0.23	17.12±0.56	16.64±0.59
Yield of paneer	20.16±0.86^{b}	20.75±0.27^{b}	21.57±0.58^{ab}	21.97±0.34^{a}	22.85±0.52^{a}	22.69±0.23^{a}
Moisture percent of paneer	40.25±0.15^{a}	40.73±0.21^{a}	44.77±1.16^{b}	45.25±0.54^{b}	47.29±1.31^{b}	46.46±0.25^{b}
Whey obtained /lit milk	0.85±0.01^{cd}	0.89±0.02^{a}	0.89±.003^{a}	0.87±0.002^{bc}	0.86±0.005^{c}	0.86±0.002^{c}

Table 2.Correlation coefficient between raw milk constituents (fat, SNF, Total solids) and yield of milk at different coagulation temperatures.

Variable	Coagulation temperature					
	Boiling Temperature	**90°C**	**85°C**	**80°C**	**75°C**	**70°C**
Fat	0.903**	0.750**	0.964**	0.485	0.497	0.887**
SNF	0.900**	0.852**	0.440	0.750**	0.760**	0.446
Total Solids	0.903**	0.771**	0.957**	0.969**	0.751**	0.930**

******Correlation is significant at the 0.01 level.

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RESEARCH ARTICLE

Identification and Molecular Characterization of *Shigella flexneri* ST-02 from Urinary Tract Infected Patient by 16S ribosomal RNA Gene Partial Sequence Analysis.

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ABSTRACT

Urinary Tract Infection (UTI) is mainly due to the entry of microorganisms and start developing to multiply in the urinary bladder. Cystitis and Urethritis are the two most common UTI among infected patients and mostly affect the bladder and urethra. The UTIs contribute significantly to the cost of providing health care in economically developed countries and it may be symptomatic or asymptomatic. Several studies such as multi-drug resistant strain, Extended Spectrum Beta Lactamase producing strain, recurrent urinary tract infection, symptomatic *Shigella sonnei*,UTI in pregnancy, polymicrobial septicemia

etc. had been conducted with reference to *Shigella flexneri*. However, a study on Uropathogenic and their molecular typing and characterisation of *Shigella flexneri* using 16s r RNA gene sequencing is scanty. In the present study, the investigators were isolated *Shigella* species from the UTI patient and identified using standard microbiological procedures. The isolated strain was further confirmed by 16S rRNA gene sequencing. The sequenced strain has been submitted to GENBANK, USA and received gene accession number (JX444058). The Electropherogram report has been generated by Quality Control of Applied Biosystem, Hyderabad and reported that the *Shigella flexneri* ST-02 consist of 939 base pairs. Finally the sequenced strain was subjected to bioinformatic tools such as BLAST and phylogenetic tree for explorative and comparative studies. To the best of our knowledge, this constitutes the first report in which *Shigella flexneri* clinical strain had been isolated for UTI patient and was characterized by molecular typing using 16s ribosomal RNA gene partial sequencing analysis.

Keywords: 16s rRNA, Bioinformatics, BLAST, Electropherogram, Molecular typing, *Shigella flexneri.*

INTRODUCTION

Urinary tract infections (UTI) contribute significantly to the cost of providing health care in economically developed countries. Urinary tract infections may be lower or upper. As early as in eighteenth century Louis Pasteur recognized urine as good culture medium for bacteria. Bacteriological examination of the urine is considered to be the major aid to the diagnosis of infection. Urine culture may constitute 25–45% of the work of the average clinical laboratory. Cultural techniques are employed not only to detect but also enumerate bacterial in the urine and their susceptibility pattern to antimicrobial agents [1].*Shigella flexneri* is species of Gram-negative bacteria and belonging to the family Enterobacteriaceae. This species is mainly associated with diarrhea in humans. But in the modern era, *Shigella* species is responsible for ESBL production [2], recurrent UTI [3], symptomatic UTI [4], polymicrobial septicemia [5], and third generation cephalosporin resistance [6].

In view of increasing reports on uropathogenic infection around the world, the purpose of the present study was to identify and molecular typing the pathogen from the patients with UTI. This work was to intends to observer the differences among the species and to carry out the sequence using 16s rRNA sequencing technique for the identification of pathogen and phylogenetic analysis of the same using bioinformatics tools.

MATERIALS AND METHODS

Clinical isolates

The UTI isolate was identified by standard microbiological procedures [7]. The isolated strain was further confirmed by molecular typing.

Reagents required for molecular studies

Sucrose (1 M)

34.23g of sucrose solution of 1 M was prepared by dissolving 34.2g in 80 ml distilled water and the volume was made up to 100 ml.

Lysozyme stock

10 mg of lysozyme was dissolved in 1.0 ml of RNAse free water (Promega, USA).

Tris-HCl (50 mM)

Tris, 12.1 g was dissolved in 80 ml of distilled water and the pH was adjusted to 8.0 with 4.1 ml of con. HCl. The volume was made up to 100 ml with distilled water.

EDTA (0.25 M)

EDTA, 9.3 g was dissolved in 80 ml of distilled water and the final volume was made up to 100 ml.

Proteinase K

20 mg of proteinase K was dissolved in 1.0 ml of RNAse free water.

N-Lauroyl sarcosine (10%)

10 g of N-Lauroyl sarcosine was dissolved in 80 ml of distilled water and the final volume was made up to 100 ml.

RNase

RNase was purchased from Genei, Banglore.

Phenol

Phenol was mixed with 10 mM of Tris-HCl (pH 8.0) and 1.0 mM EDTA.

Chloroform and Isoamyl alcohol

Chloroform 24 ml and Isoamyl alcohol 1.0 ml was mixed.

TE Buffer

Tris 1.576 g was dissolved in 50 mL of glass distilled water. Then it was added with 2.0 mL of 0.5 M EDTA and the volume was made up to 100 mL with glass distilled water.

Loading dye (6x)

Sucrose, 40 g and bromophenol blue, 25 mg were dissolved in 50 ml of glass distilled water. Tris (1.0 M), 0.6 ml and EDTA (0.5M) 120 µl were added and the volume was made up to 100 ml with glass distilled water.

Ammonium acetate

Ammonium acetate solution of 7.5 M was prepared with distilled water.

Ethanol

Seventy ml of ethanol was dissolved in 30 ml of distilled water.

Isolation of genomic DNA

The culture of *Shigella sp.*was separately grown in 50 ml of LB medium for 16 h. Three ml of the culture was centrifuged at 7,000 rpm for 15 min at 10°C. The pellet was suspended in 3.0 ml of Tris-EDTA buffer and this was followed by the addition of 600 µl of 1 M sucrose solution and 600 µl of a 10 mg/ml solution of lysozyme and the mixture was incubated for 1 h. The suspension was centrifuged at 14,000 rpm for 10 min and the supernatant was discarded. The pellet was resuspended in 300 µl of 50 mM solution of Tris-HCl, 100 µl of a 0.25 M solution of EDTA, and 10 µl of a 20 mg/ml solution of proteinase K and incubated for 30 min at 37°C. This was followed by the addition of 100 µl of 10% solution of N-Lauroylsarcosine and incubated for 20 min at 37°C to ensure the complete lysis of the cells. After that 500 µl of sterile glass distilled water was added along with 10 µl of RNAse and incubated for 30 min at 37°C. After incubation equal volumes of phenol was added and gently shake for 2 h followed by centrifugation at 14,000 rpm for 30 sec. Then the aqueous top layer was separated and the bottom layer was discarded. Chloroform

was added with the aqueous top layer and shake the tube by hand for about 30 sec and 520 µl of TE buffer was added to bring in to the original volume. Then the 260 µl of 7.5 M ammonium acetate was added to enhance the DNA precipitation. After that 1.6 ml of ice cold 95% ethanol was added to precipitate the DNA. It was centrifuged at 14,000 rpm for 5 min at 4°C and the supernatant was discarded. The DNA was washed with 1.0 ml of 70% ethanol followed by centrifugation at 2,800 rpm for 5 min. Then the pellet was collected, air dried and resuspended in 100 µl of RNAse free water [8].

Spectrophotometric Estimation of DNA

The DNA was quantified by measuring its absorbance at 260 nm in a spectrophotometer. The absorption of 1.0 OD corresponds to 50 µg/ml of double stranded DNA and 40 µg/ml of single stranded DNA[9]. The purity of DNA was determined at 260 and 280 nm. DNA solution that had a value of 1.8 obtained from the data recorded at 260 nm/280 nm is considered as pure. DNA samples, which gave the ratio of 1.8 and above were used.

Agarose gel preparation

To 20 mL of Tris-EDTA buffer (TE), 0.2 g of agarose was added. This was kept in a boiling water bath until the agarose melted. Then the temperature was brought to 65^{o}C and 1.0 µl of ethidium bromide was added. This was poured onto the platform to form a gel at room temperature.

Agarose electrophoresis

Electrophoresis was performed in a horizontal sub-marine apparatus. Agarose (1%) was melted with TE buffer and 1µl of ethidium bromide at the concentration of 4 mg/ml. TE buffer was used as the tank buffer and electrophoresis was carried out for 30 min at constant voltage. The gel was visualized under UV transilluminator and photographed.

PCR primer design
16s rRNA and universal primer

In the present study 16s rRNA PCR primers were designed to amplify approximately 1,300 bp of a consensus 16s rRNA gene: forward primer 63f (5`-CAG GCC TAA CAC ATG CAA GTC-3`) and reverse primer 1387r (5`-GGG CGG WGT GTA CAA GGC-3`). The consensus 16S rRNA gene was amplified by the procedure prescribed by Julian *et al.,* (1998) [10].

Polymerase chain reaction

Polymerase chain reaction was performed in a T3-Thermocycler (Bio Metra Apparatus, USA) to produce multi copies of a specified DNA. The quantity of PCR reaction mixture for 16s rRNA is summarized in the Table-I. The reaction mixture was mixed gently and centrifuged at 1000 rpm for 1 min and incubated for reaction in thermocycler. The overall Thermocycler reactions are mentioned in Table-II and the quantity of PCR reaction mixture for gene specific serine protease is tabulated in Table-III. The reaction mixture was mixed gently and centrifuged at 1000 rpm for 1 min and incubated for reaction in Thermocycler.

Agarose gel electrophoresis (PCR product)

Electrophoresis was performed in a horizontal sub-marine apparatus (Medox, India). Agarose (2%) was melted with TE buffer and 2 µL of ethidium bromide at the concentration of 4 mg/mL was added. TE buffer was used as the tank buffer and electrophoresis was carried out for 30 minutes at a constant voltage. The gel was visualized under UV transilluminator and photographed.

Purification of PCR product

The amplified PCR product carrying 16s rRNA gene was purified using Quiagen kit method and analyzed by sequencing.

DNA sequence

The purified PCR product was partially sequenced using Applied Biosystem Instrument (ABI) Prism 310 Genetic, Hyderabad, India.

16s rRNA Sequence analysis

Sequence alignments provide a powerful way to compare novel sequences with previously characterized genes. Both functional and evolutionary information can be inferred from well designed queries and alignments. BLAST- Basic Local Alignment Search Tool (http://www.ncbi.nlm.nih.gov/blast/) provides a method for rapid searching of nucleotide and protein databases. Since the BLAST algorithm detects local as well as global alignments, regions of similarity embedded in otherwise unrelated nucleotides and proteins can be detected. Both types of similarity may provide important clues to the function of uncharacterized nucleotides and proteins.

Phylogenetic tree analysis

Phylogenetic tree analysis is the technique of methodically demonstrating an evolutionary relationship between species. This method is useful to determine whether group of genes are related through a process of divergent evolution from a common ancestor or the result of convergent evolution. In the present study, CLUSTALW was employed to analysis the evolutionary phylogeny.

RESULTS AND DISCUSSION

The data on DNA extraction and PCR amplification of uropathogenic bacteria is shown in the Figure-1. The isolated product was subjected to 16s rRNA gene sequencing. A total of 939 base pairs were obtained and the nucleotides sequence is mentioned in the Figure-2. Further the sequenced partial gene was submitted to GenBank, USA and got gene accession number JX444058. Ishrat J. Azmi *et al.* (2014) [11] had investigated the prevalence and mechanisms of fluoroquinolone resistance in *Shigella* species in Bangladesh from diarrhoeal disease. The researchers performed antibiotic susceptibility testing, plasmid profile analysis, determination of resistant factor, DNA sequence analysis in comparison of strain isolated from China. However, the present investigating group had reported the same methodology for *Escherichia coli* clinical strain for the exploration of molecular identification of uropathogenic bacteria from UTI patients [12].

Electropherogram, a report generated by gene sequencer by tracing of specific nucleotide compound in different colors which are eluted from the column. The evidence of Electropherogram of the 16s rRNA gene sequencing of clinical strain *Shigella flexneri ST-02* is illustrated in the Figure-3. In another study the researchers had studied the restriction endonuclease cleavage patterns of rRNA genes of 72 isolates of *Shigella flexneri* [13].

In order to confirm the identity and phylogenetic relationship, the sequenced strain was compared with other strains of the same species to study the evolutionary phylogeny and illustrated in Figure-IV. The sequence of *E. coli* clinical strain was subjected with the similar species available in GENBANK for the comparative analysis sequence using Basic Local Alignment Search Tool (BLAST) technique. Furthermore, the phylogenetic relationship between the query and the subject were subjected to phylogenetic tree software tool [CLUSTALW].The report of phylogram is illustrated in the Figure-4.

Clarridge JE (2004) [14] reviewed the impact 16S rRNA Gene Sequence Analysis for Identification of Bacteria on Clinical Microbiology and Infectious Diseases. The poor inaccuracy results in phenotypic identification can be replaced by genotypic identification in the routine clinical microbiological laboratories. In order to depict the significance of 16s rRNA gene in Clinical microbiological laboratories, the researchers pointed out the application of 16s rRNA gene sequencing in microbiology in the Figure-5.

CONCLUSION

The patients with renal aliments are vulnerable to malfunctioning of vital components of urinary tract if they are superimposed with infections by uropathogens. Several studies had portrayed the complications caused by UTI pathogens. Thus the attempts of the treatment of these categories of UTIs shall be challenged. Therefore early diagnosis UTI with special attention to the detection of Uropathogens becomes a vital step in effective treatment regime.

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Table-1. PCR reaction mixture for 16S rRNA.

S. No.	Required PCR reaction mixture for 16s rRNA	Quantity
1	Forward primer	2.0 µl
2	Reverse primer	2.0 µl
3	Template DNA	4.0 µl
4	PCR master mixture	25 µl
5	RNase free water	17 µl
6	Total volume	50 µl

Table-2. Thermocycler reaction.

S. No.	Temperature	Time interval	Reaction
1	95°C	3.0 min	Initial denaturation
2	95°C	1 min	Denaturation
3	55°C	1 min	Annealing
4	72°C	1.5 min	Cycle extension
5	72°C	10 min	Final extension

Table-3. PCR reaction mixture for gene specific serine protease.

S. No.	Required PCR reaction mixture for 16s rRNA	Quantity
1	Forward primer	2.0 µl
2	Reverse primer	2.0 µl
3	Template DNA	4.0 µl
4	PCR master mixture	25 µl
5	RNase free water	17 µl
6	Total volume	50 µl

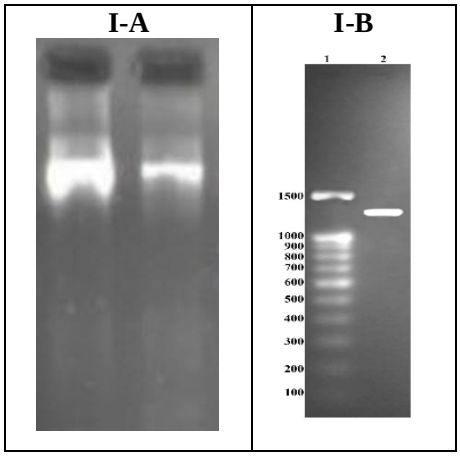
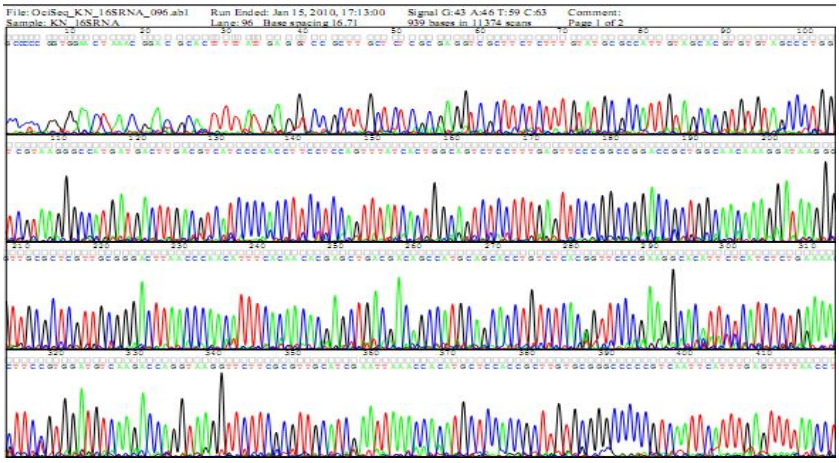


Figure-1.Genomic DNA (I-A) and PCR amplification (1-B) of 16s rRNA gene of *Shigella flexneri* ST-02.

1 gcccccggtg gaactaaacg gacgcacttt ttattgaggt ccgcttgctc tcgcgaggtc
61 gcttctcttt gtatgcgcca ttgtagcacg tgtgtagccc tggtcgtaag ggccatgatg
121 acttgacgtc atccccacct tcctccagtt tatcactggc agtctccttt gagttcccgg
181 ccggaccgct ggcaacaaag gataagggtt gcgctcgttg cgggacttaa cccaacattt
241 cacaacacga gctgacgaca gccatgcagc acctgtctca cggttcccga aggcacattc
301 tcatctctga aaacttccgt ggatgtcaag accaggtaag gttcttcgcg ttgcatcgaa
361 ttaaaccaca tgctccaccg cttgtgcggg cccccgtcaa ttcatttgag ttttaacctt
421 gcggccgtac tccccaggcg gtcgacttaa cgcgttagct ccggaagcca cgcctcaagg
481 gcacaacctc caagtcgaca tcgtttacgg cgtggactac cagggtatct aatcctgttt
541 gctccccacg ctttcgcacc tgagcgtcag tcttcgtcca gggggccgcc ttcgccaccg
601 gtattcctcc agatctctac gcatttcacc gctacacctg gaattctacc cccctctacg
661 agactcaagc ttgccagtat cagatgcagt tcccaggttg agcccggggg atttcacatc
721 tgacttaaca aaccgcctgc gtgcgcttta cgcccagtaa ttccgattaa cgcttgcacc
781 ctccgtatta ccgcggctgc tggcacggag taagccggtg cttcttctgc gggtaacgtc
841 aatgagcaaa ggtattaact ttactccctt cctcccccgc tgatagtaac tttacaaac
901 cgaatgcctt cttcataaca cgcggcaatg ggctgcatg
//

Figure-2. Molecular Sequencing Report on 16s rRNA Gene (939 base pairs).

BASE COUNT 192 a 297 c 216 g 234 t
ORIGIN Gene Accession Number (GENBANK, USA)-JX444058



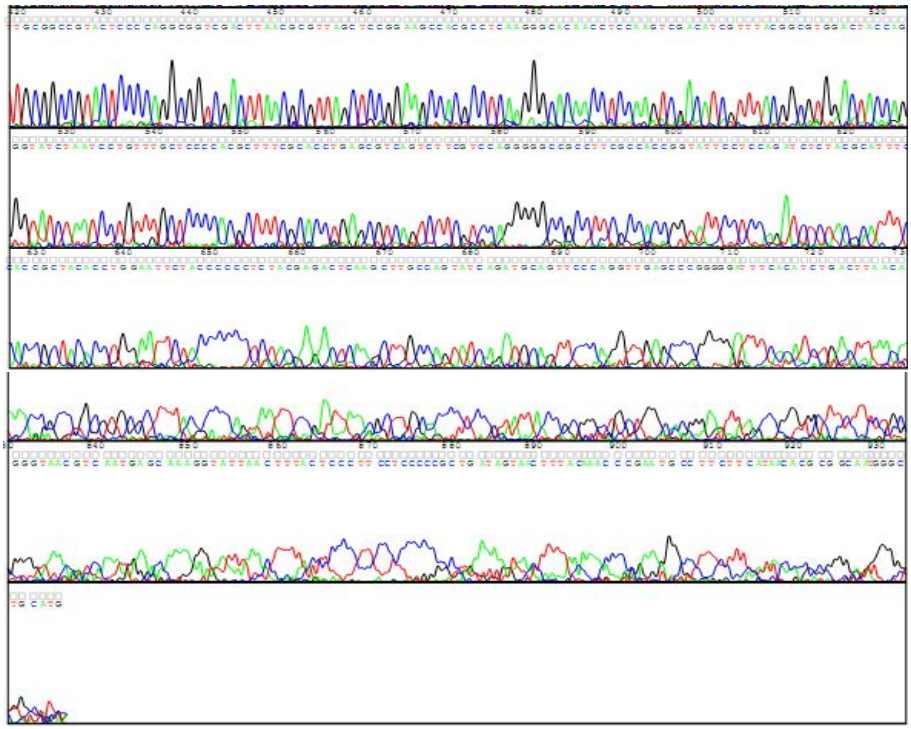


Figure- 3.Electropherogram of the 16S rRNA Gene Sequencing of Clinical Strain *Shigella flexneri* ST-02.

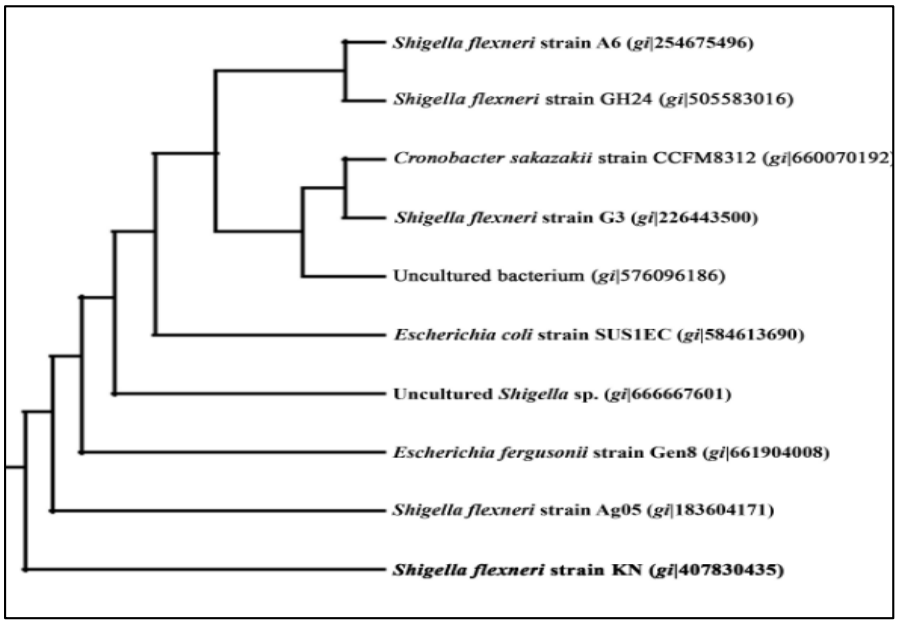


Figure- 4.Phylogenetic analysis of *Shigella flexneri* ST-02 using clustalw.

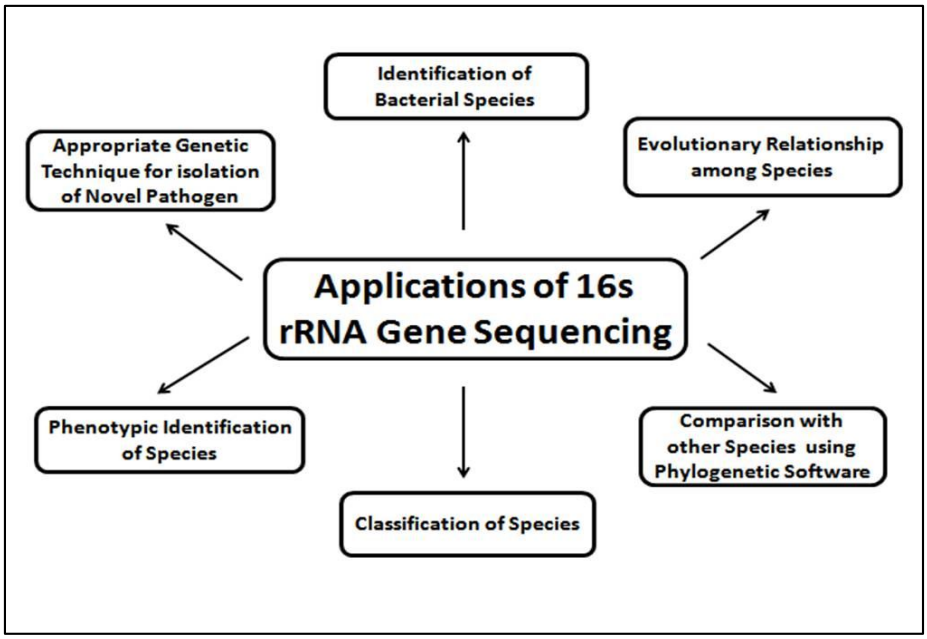


Figure-5.Applications of 16S rRNA Gene Sequencing in Microbial Science.

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RESEARCH ARTICLE

An Investigation Effects of Temperature and Concentration Variation (p^-) Band in a Multiple Structure into Operation Mosfet I Type Body Contact Partly Depleted Silicon on Insulator.

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ABSTRACT

The effects of temperature and (p^-) band concentration variation in a transistor silicon on isolator partly depleted with body contact I-gate were examined using an ISE-TCAD simulator. Then, the sample's body voltage was obtained based on the circuit scheme of a multiple transistor structure with I-gate body contact at any spot of the (p^-) band. After that, a suitable concentration range to apply to the (p^-)band was obtained based on the circuit scheme and channel area colliding ionization current, and, in that condition, the sample's body voltages for two typical concentrations were calculated and applied to the transistor with I-gate body contact. The output indices of transistor with I-gate body contact were determined and compared with the transistor with floating body. The findings indicated that for mosfet output indices with I-gate body contact for specific concentrations do not show kink effect, and even the output parameters of the transistor have significantly improved relatively to the tool with H-gate body contact and floating body.

Key words: pd-soi, (p^-) band, I-gate contact, body resistance.

INTRODUCTION

As the manufacturing technology of transistors expans into Nano dimensions, silicon transistors on insulators show greater advantages over silicon body transistors (Yannis, 1999). This makes them more suitable for practical uses. Some of the advantages of those transistors include source/drain static capacitor reduction, leak flow prevention due to better qualities of shallow bonds, better transfer condition, reduced output conduction, reduced effects from short canal and improved subthresholdslope, higher-speed, lower feed, elimination of blockage effect, 15 to 20 percent better working frequency in digital circuits such as memories and microprocessors (collinge, 2004; Cristoloveanu, 1995; shaidi, 1999; Jones, 1998).However, that insulating layer leads to defects including but not limited to the self-heating and floating body phenomena. Self-heating is caused by much lower heat conduction of the insulating layer than the semi-conductor silicon layer. This limits heat transfer to lower layers of the transistor, overheating in devices and self-heating which will reduce the mobility of carriers, thermal transfer, drain current and speed (Dallman, 1995; Dallman,1995).The other effect is that called floating body phenomenon. The region of the silicon mosfet body on the partly depleted insulator located at the top part of the BOX oxide is not depleted of carriers, does not have any contact, and is floating electrically. Thus, the pores produced due to the impact ionization mechanism are collected at the channel compression region of the floating body and cause a gradual increase in body voltage. That gradual increase leads to non-linear behavior in the output index of the device (Nishiyama, 1997).This study examines the effects of temperature and (p^-) band concentration changes on the performance of pd-soi transistors body contact I-gate; the output indices of that transistor are extracted considering appropriate temperature and concentration, and the floating body mosfet and body contact H-gate mosfet are compared.

METHODOLOGY

Mosfet silicon on insulator with body contact I-gate structure

A pd-soimosfet channel type n body contact I-gate and channel length 45 nm is designed. The errors from the manufacturing process even at very limited scales in making FD-soimosfet severely affect the performance of the device. This defect, however, is a lot smaller in pd-soimosfets due to their proper silicon film thickness, and the production process of these devices is most cost-effective. In this design, the pd-soimosfet was used and a better mosfet performance and omission of floating body effects were obtained thanks to the advantages of I-gate body contact over other contacts (chieh-Lin wu, 2012).

Figure 1 shows the mosfet structure from above. A source and drain implant stopper block is used which expands (p^-) type body. This region is the same material as the silicon film body with a lower concentration. As seen in the figure, body contact can be achieved on both sides of this band passing through the transistor by expanding that block on both sides. A course for the aggregated pores from the impact ionization mechanism in the transistor channel near the compact region outward can be made by grounding the contacts developed on both sides of the (p^-) band.The volume design in certain devices, such as H-gate, T-gate, etc. and other devices having this type of body contact becomes too large due to larger spaces occupied by the device gate. In today's integrated designs, this is considered a defect. Also, because of larger capacitor gate surface area, the capacitor gate in such devices takes on larger values which limits using these transistors in higher frequency applications, and reduces mosfet speed, too (Daghighi, 2005).

In other forms of body contact such as the traditional body contact or similar contacts, the channel current is reduced due to the effective channel width being affected due to the contact form.Therefore, the silicon mosfet on the insulator with body contact I-gate resolves previous problems to a considerable extent, and the form of these contacts makes it possible to study each transistor's behavior in a multiple structure separately by offering structures including several transistors (Daghighi, 2008).

Figure 2 shows a multiple structure of mosfet silicon on insulator partly depleted with body countact I-gate that we used in designing from a structure with 35 fingers suitable for RF and high frequency applications.The (p¯) band passing through transistor body contact I-gate shows resistance. The magnitude of this resistance follows the device temperature, (p¯) band concentration and the voltage given to the gate terminal. In this simulation, the effects of temperature and concentration changes on mosfet with I-gate contact performance were studied. Then, under a specific concentration of (p) band and higher temperature for (p), maximum body voltage in a structure with 35 transistors was obtained. By exerting this value to the transistor, the output parameters mosfet silicon on insulator partly depleted with body contact I-gate were obtained and compared to the mosfet silicon on insulator with floating body and transistor silicon on insulator with body contact H-gate. The simulation is a hydrodynamic one where the pores and electrons temperatures are not equalized to the litis temperature (Desise Manual, 2013). In this simulation, the temperature of the (p¯) band equals 485 K, channel length 45 nm, silicon film thickness 75 nm, gate oxide thickness 1.2 nm, distance between gate to transistor gates 270 nm, and the length of the lateral part of (p¯) band, i.e. the developed part of (p¯) band is 80 nm.

Simulation and examination of temperature effects on the performance of pd-soimosfet body contact I-gate.

Figure 1-3 shows the effects of temperature increase on the mobility of carriers in mosfet silicon film body contact I-gate under tempertures 30 K & 485 K. drain voltage and 1.5 V gate and a hydrodynamic simulation model were used in this simulation.As seen in the figure, as temperature rises from 300 to 485 K, the majority carriers mobility (pores) decreases by 10^{-6} times whereas the minority carriers mobility increases by 10^{7} times. This can be explained as, according to Figure 3-4, as the device temperature goes higher, the mobility of the majority carriers existing in the channel area and effective threshold voltage are reduced. As these two parameters are related to the channel current, in higher channel currents, the carriers' mobility is he predominant component affecting channel current, and, in lower channel currents, the threshold voltage is the predominant factor affecting channel current. On the other hand, as shown in Figure -2, as temperature increases, the minority carriers' mobility increases remarkably. Thus, in the upper threshold region where the predominant current is provided by minority carriers, the current called the sleep current also increases leading to higher power consumed in the device. By using appropriate doping in the silicon film area and giving the appropriate bias to mosfet terminals, these effects can be controlled to a desirable extent.

Figure 4 shows network temperature the silicon on insulator partly depleted body contact I-gate mosfet. As seen in the figure, at 300 K, the network temperature distribution in the channel region and, generally, in the silicon film body is homogeneous; however, as temperature rises from300 K to 485 K, the device's temperature around the interface of the front gate and channel region grows larger than other parts of the silicon film, thus, it can be said, based on previous findings, that the channel current will also change due to temperature rise.

Figure 5 shows the graph of (p¯) band current according to the potential difference given to the two ends of the (p¯) band under 300 K and 485 K in two different concentrations. As seen in Figure 5, (p¯) band resistance increases with higher temperatures so that, with many simulations, it was found that, in lower band concentrations with little impurity, the changes in (p¯) band resistance increase remarkably as temperature goes up. This behavior has been illustrated for two typical concentrations of 2e018 and 6e016 $(cm^3)^{-1}$ in Figure 5. As seen in the figure, at 6e16 atom/cm^3, the (p¯) band resistance increased by 10 percent from 300 K to 485 K, while in a device with the same parameters as before but change of(p¯) band concentration from 6e16 to 2e18 atom/cm^3 and change of temperature from 300K to 485K, the (p¯), band resistance shows 50% increase. Thus, the output parameters of the transistors were extracted based on the above points relating to the effect of temperature on the device's performance silicon on insulator partly depleted with body contact I-gate giving a temperature of 485 K to (p¯) band to and taking into considering the temperature of pore and electron charge carriers and that of the silicon network with the hydrodynamic simulation model.

RESULTS AND DISCUSSION

Figure 6 shows a longitudinal section of the multiple structures in Figure 2. The current changes graph is drawn based on a very small potential difference given to the two ends of the (p^-) band for a structure with one or two transistors. Then the net resistance from the increase of the length of the structure is obtained from the differences of the slope from the graphs. According to the multiple structure offered in Figure 2 and its longitudinal section shown in Figure 6, a circuit model can be considered for the band connecting the body to body contact. As seen in Figure 7, resistance R is part of body, and I_{ii} is the current from impact ionization mechanism. Based on the circuit scheme offered for a I-gate body contact Silicon on insulator partly depleted mosfet multiple structure and (p^-) band resistance and current from the impact ionization mechanism, the body voltage at any point of (p^-) band connected to body contact was obtained through simulation for the two concentrations 5e16 and 7e16 atom/cm^3. A very important point in calculating body voltage in the formula offered here is (p^-) band resistance since not just any concentration can be used for (p^-) band. Therefore, a proper range to apply concentration to (p^-) band in mosfet silicon on insulator partly deleted with body contact I-gate was determined with many time-consuming simulations and by considering the impact ionization current magnitude from simulation. The ideal impact ionization current by considering (p^-) band resistance was determined at 1.112×10^{-8} (A).concentration range was determined from 5×10^{16} to 1×10^{17} according to silicon on insulator mosfet body contact I-gate in 45 nm technology and giving a temperature of 485 K to (p^-) band.

Output Indices of mosfet silicon on insulator partly depleted body contact type I-gate compared to pd-soi mosfet with body contact H-gate and mosfet silicon on insulator with floating body:

As shown in figure 8, in pd-soi transistor body contact I-gate, not only a Kink effect is not seen but its lighting current is larger than pd-soi floating body and silicon on insulator partly depleted body contact H-gate transistor.As seen in Figure 9, for larger concentrations than 5e16 atom/cm^3 for (p^-) band at body contact I-gate, the sub-threshold slope parameter and device sleep current have improved compared to floating body transistor and body contact H-gate transistor.In Figure 10,output conductance in state floting body to encounter kink effect and to lieu of larger concentrations than 5e016 for (p^-).band at mosfet with body contact I-Gate output conductance less than body contact type H-gate.In Figure 11, the mosfet output capacitor with body contact H-gate is much larger than mosfet body contact I-gate. As body voltage increases, (p^-) band concentration in gate capacitor also increases.

CONCLUSION

Lowering (p^-) band concentration for better passage of integrated pores due to impact ionization mechanism intensifies temperature effects on the resistance of this part ((p^-) band). According to the impact ionization current from device physics, the proper concentration given to (p^-) band to obtain a logical body voltage is concentrations from 1×10^{17} to 5×10^{16}. This finding is a result of repeated simulations.The sample's body voltage was determined for two typical concentrations 5e16 and 7e16 atom/cm^3 and given to the transistor. The results appear in Table 1. According to the values from Table 1, it can be said that as (p^-) band concentration increases from 5×10^{16} to 7×10^{16}, the sub-threshold slope will increase,and the sleep current and DIBL & I_{ON} parameters will decrease. Also, all parameters given for mosfetbody contact H-gate have improved.

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Table 1.pd-soi output indices body contact I-gate and H-gate compared to mosfet with floating body.

Parameter	V_T(v) vd=1.5v vgs=1.5v	V_T(v) vd=0.05v vgs=1.5v	I_{OFF} (A) vd=1.5v vgs=1.5v	SS (vd=1.5v) (v/decad)	SS (vd=0.05v) (v/decad)	I_{ON} (A) (vd=1.5v) vgs=1.5v	DIBL
5e16	0.11613	0.03470	4.677×10^{-6}	0.08582	0.015058	0.000813	0.056162
7e16	0.21997	0.16703	1.445×10^{-7}	0.09399	0.09073	0.000703	0.036511
bc=0	0.29539	0.23252	1.2×10^{-8}	0.0966	0.8489	0.000630	0.043358
Floting	0.12965	0.22661	8.135×10^{-7}	0.04778	0.0868	0.000610	0.066866
H-gate	0.17435	0.0989	1.113×10^{-6}	0.089	0.01241	Effect-kink	0.052035

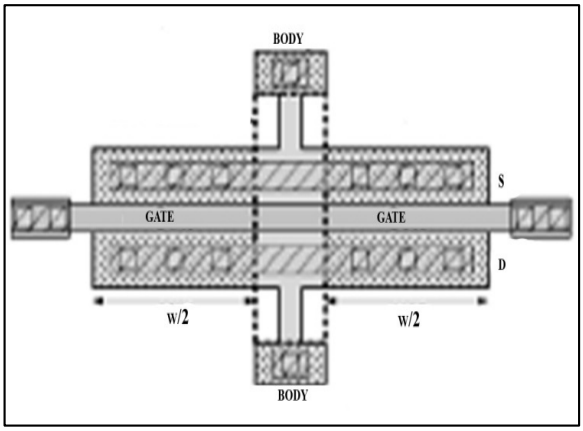

Figure 1. pd-soi mosfet structure body contact I-gate[9]

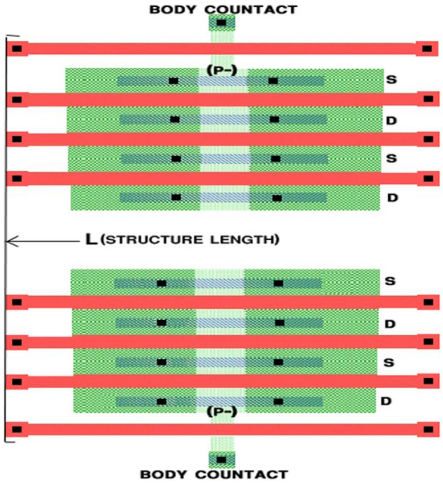

Figure 2. Multiple structure of pd-soi transistor body contact I-gate.

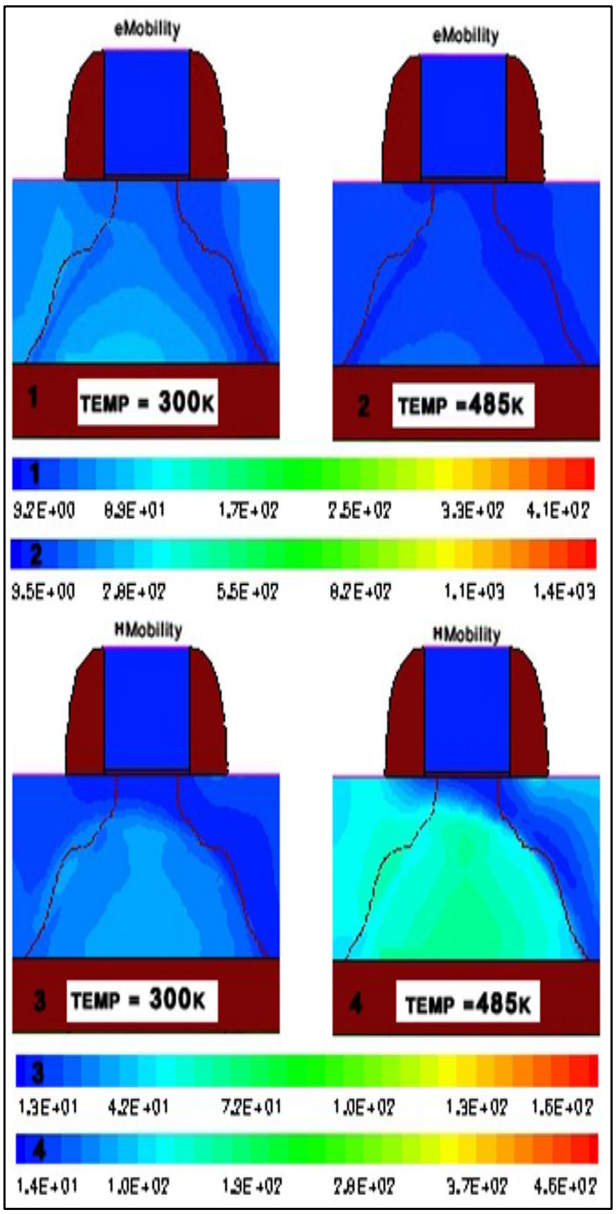

Figure 3.Effects of temperature on carriers mobility in pd-soi body contact I-gate.
2-1- Electrons mobility at 300 K and 485 K in mosfet body contact I-gate
4-3 Pores mobility at 300 K and 485 K in mosfet body contact I-gate.

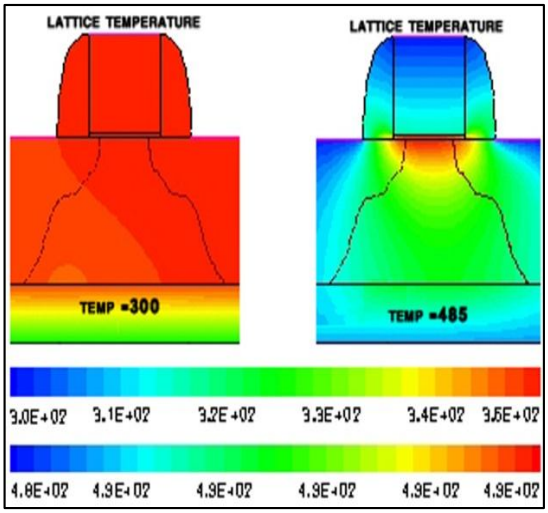

Figure 4.lattice temperature distribution profile at 300 K and 485 K in pd-soimosfet body contact I-gate.

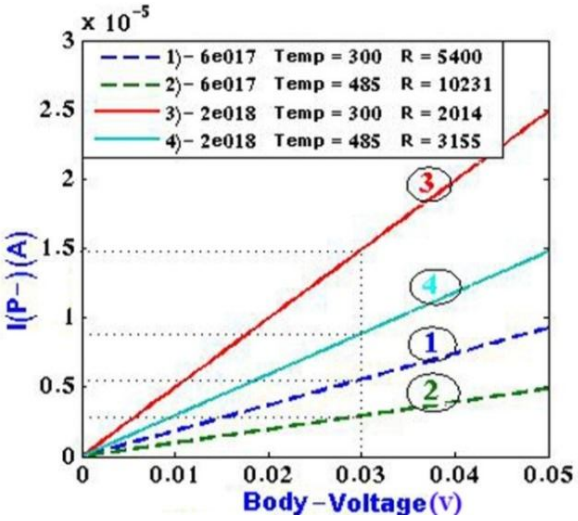

Figure 5. Effects of temperature and concentration on (p^-) band.

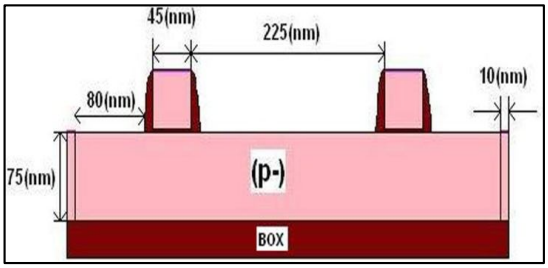

Figure 6. Longitudinal section of multiple structure mosfet with I-gate body contact.

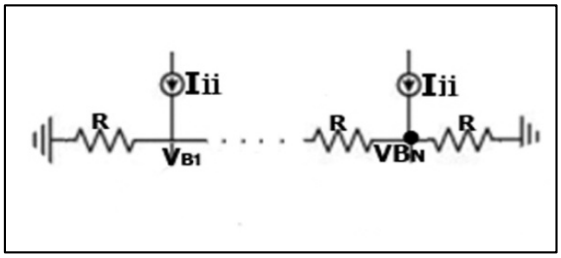

Figure 7. Circuit scheme of mosfet multiple structure pd-soi body contact I-gate.

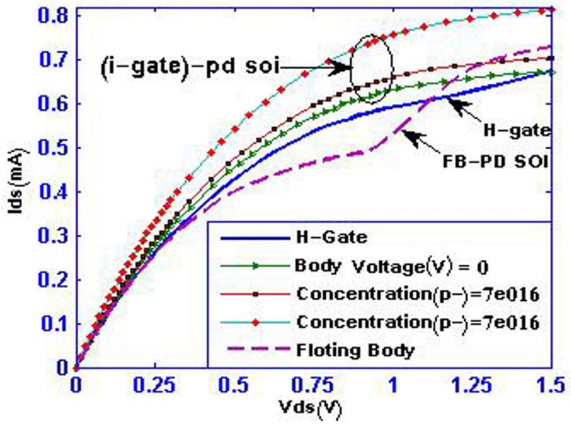

Figure 8. I_{DS} current changes based on V_{DS} at V_{GS}=1.5 V.

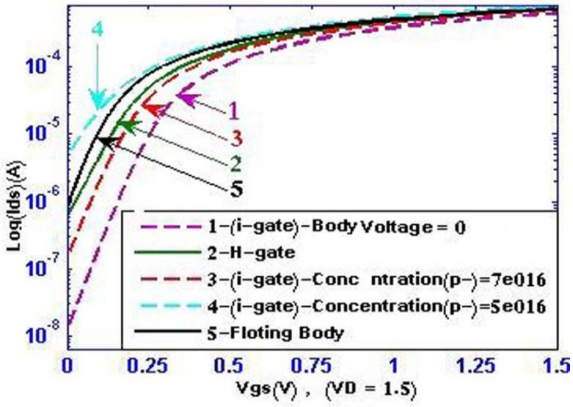

Figure 9.Log(I_{DS}) current changes based on V_{GS} at V_{DS}=1.5 V.

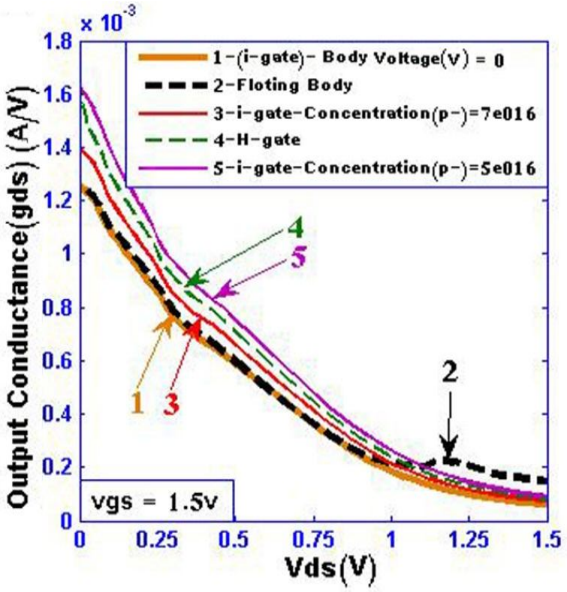

Figure10.g_{DS} changes based on V_{DS} at V_{GS}=1.5V.

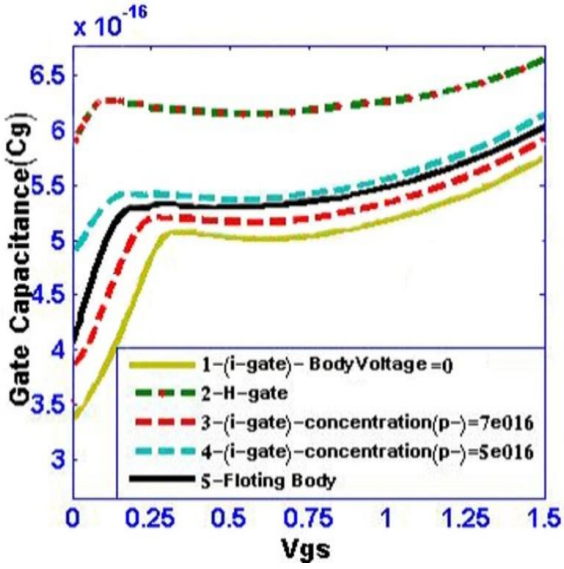

Figure11.Cg changes based on V_{DS} at V_{DS}=1.5 V.

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RESEARCH ARTICLE

Polymorphism of Growth Hormone Gene in Yak and Swamp Buffalo.

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ABSTRACT

A total of randomly chosen 25 buffaloes and 30 yaks were used for polymorphism studies in growth hormone and its receptor genes using PCR-RFLP technique. DNA from whole blood was isolated using High salt method. The yield of DNA extracted from 10ml of blood ranged from 318 μg to 648 μg with a mean of 483 μg in swamp buffaloes, 328 μg to 739 μg with a mean of 533.5 μg in yaks. The annealing temperature for optimum amplification of target sequence of GH genes is 59^{o} C for 1min for both swamp buffaloes and yaks. A PCR product of 790bp size was amplified for both GH genes as well as for GHR gene. The PCR-RFLP analysis of 3' flanking region of GH gene with *Alu I* gave three products of size 530bp, 170bp and 90bp in swamp buffaloes while three products of size 430bp, 270bp and 90bp were observed in yaks. No polymorphisms could be observed within both the species. PCR-RFLP analysis of the amplified 3' flanking region of the GH gene with *Pst I* did not reveal any restriction endonuclease sites in both swamp buffaloes and yaks.

Keywords: PCR-RFLP technique, GH gene, swamp buffaloes, yaks.

INTRODUCTION

The domestic Asiatic buffaloes occur in two types according to their natural habitat viz. Swamp type (*Bubalus carabanesis*) and River type (*Bubalus bubalis*). The natural habitat of swamp buffaloes is swampy and marshy land. The geographical distributions of swamp buffaloes are mostly in South Asian countries as well as in North Eastern states of India.

The yak *(Poephagus grunniens* L.) is the multipurpose bovine of highlanders. Yak is a unique bovine species of economical importance in high hill and snow bound areas, and had originated from the cold regions of Tibet and Siberia. It belongs to subfamily bovine of family Bovidae. The three groups under the subfamily bovine are Bisontine, Taurine and Bubaline. The generic name 'Poephagus' means the grass eater and the 'grunniens' accounts for its grunt. Considering the harsh environmental conditions and scarcity of grazing resources at high altitude, the production level is still very important for highlanders where other animals fail to survive.

The potential candidate genes, which greatly influence growth and development of animals, include GH gene and its receptor gene. Growth is one of the economic traits in the livestock which is controlled by GH or somatotropin synthesized by anterior pituitary. The biological effects of growth hormone (GH) involve a variety of tissues and the metabolism of all nutrient classes: carbohydrates, lipids, proteins, and minerals. These coordinated changes in tissue metabolism alter nutrient partitioning and thus play a key role in increasing growth performance or milk yield (Etherton and Bauman, 1998). Growth hormone and its receptor gene have an essential role in lactation and growth process thus became a perfect candidate marker associated with the somatotropic axis. The somatotropic axis, which essentially consists of growth hormone releasing hormone (GHRH), growth hormone (GH), insulin-like growth factors I and II (IGF-I and IGF-II), and their associated binding proteins and receptors, plays a key role in the metabolism and physiology of mammalian growth (Curi *et al*. 2005).

Growth hormone (GH) exerts a key control in nutrient use (Bauman, 1992) mammary development and growth (Brier *et al.,* 1991). It also modulates intermediary metabolism and other physiological processes e.g., aging (Copras *et al*., 1993) and immune responsiveness (Blalock 1994). Thus the GH gene is a promising candidate gene worth studying for its effects on milk and growth related and immune response traits. Selection for milk yield has been shown to be associated with increased blood levels of GH (Bronczek *et al.,* 1988). In the present study we are studying the polymorphism of growth hormone gene in Swamp buffalo and Yak using PCR-RFLP technique.

MATERIALS AND METHODS

A total of randomly chosen 25 buffaloes and 30 yaks were used for polymorphism studies selected from buffalo farm of Network Project on Swamp Buffalo, Department of Animal Genetics and Breeding, College of Veterinary Science, Khanapara, Guwahati and yaks maintained at Nyukmadung yak farm, National Research Centre on Yak, Dirang, Arunachal Pradesh.

DNA was extracted from whole blood within 24 hours after collection using High salt method as described by Montgomery and Sise (1990), with minor modifications. The following primer sequences were used for Growth Hormone (GH) gene amplification.

GH	F: 5'-Biotin-CTCTTCTCCAGGGTTTATC 3' R: 5'- CTGAACTCCTCAGTTTCCTC-3'	(Zhang Qing *et al*. 2004)

The PCR reaction was carried out as per the method of Zhang Qing *et al*. (2004) for GH gene with minor modifications. PCR reaction was carried out in 0.5ml PCR tubes in a thermal cycler (Applied Biosystems, USA). The PCR conditions for GH gene give below table1.

RESULTS AND DISCUSSION

The yield of DNA extracted from 10ml of blood ranged from 318 μg to 648 μg with a mean of 483 μg in swamp buffaloes and 328 μg to 739 μg with a mean of 533.5 μg in yaks. The O.D ratio was in the range of 1.7-1.9 indicating purity of the extracted DNA from buffaloes and yaks. For standardization of the PCR a top-down approach was followed, starting from the most stringent conditions, the condition were relaxed slowly until specific amplification was achieved.

The PCR products of 790bp GH gene was electrophoresed in 1% agarose gel at 90V for 45 minutes along with molecular marker (100bp ladder) and visualized under Gel doc system (Fig 1).PCR-RFLPs are the variations produced by digestion of specifically cloned sequences of DNA with restriction enzyme. Swamp buffalos (N=25) and yaks (N=30) were screened for polymorphism in the amplified segment of the GH gene consisting of 3'flanking region comprising exon V and partial intron IV. The PCR-RFLP technique was used to identify the genetic variants in GH gene based on the variations produced by digestion of 790bp PCR amplified product with restriction enzyme *Alu I.* The restriction fragments were then resolved by agarose gel electrophoresis (3%). On restriction digestion three products of size 530bp, 170bp and 90bp were observed in swamp buffaloes (Fig 2), while three products of size 430bp, 270bp and 90bp were observed in yaks. However, no polymorphisms could be detected in both the species.

In this study PCR-RFLP analysis at GH hormone gene were attempted to characterize swamp buffaloes and yaks using primers specific to cattle, as very little information is available in these two species. In all animals belonging to both species the size of amplified product was 790bp, indicating the conservation of DNA sequence between buffalo and yak a similar results were reported in yaks by Zhang Quig *et al., (*2004).The conventional RFLP technique is cumbersome and laborious; hence the present study was attempted using PCR-RFLP technique to identify the genetic variants of GH genes in yaks and buffaloes. This technique was found to be simple and efficient in identifying the genetic variants of GH gene. Earlier researchers have already used the PCR-RFLP technique successfully to study genetic variants in GH in cattle (Unanian *et al.* 2000), goat (Chitra *et al.* 2004), Chinese yaks (Zhang Qing *et al.,* 2004) and riverine buffalo (Biswas *et al.* 2003; Aravindakshan *et al.* 1997 and Pal *et al.* 2005)

Monomorphism was observed in case of *Alu I* digestion in swamp buffaloes in 3' flanking region of the GH gene, indicating the probable absence of any mutation suggesting high degree of conservation in swamp buffaloes of Assam(Table.2). The present findings are in agreement with the earlier reports of Biswas *et al.* 2003, Aravindakshan *et al*. (1997) and Pal *et al*. (2005) in Murrah buffaloes and Mitra *et al*. (1995) in Nili-Ravi buffaloes. The probable cause for the lack of polymorphism could be due to the fixation of allele in buffaloes and yaks through long-term natural selection, creating gene homozygosity reflecting in monomorphism. It could also be due to small sample size. Further studies using large number of samples are required to confirm monomorphism in GH genes for the restriction enzymes in yaks and buffaloes. However, different workers have shown polymorphism in GH gene of cattle (Kirkpatrick, 1992 and Vukasinovik *et al.* 1999) but no one had reported polymorphism in the 3' flanking region of GH gene.

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Table1.The PCR reaction was carried out as per the method of Zhang Qing *et al*. (2004) for GH gene with minor modifications. PCR reaction was carried out in 0.5ml PCR tubes in a thermal cycler (Applied Biosystems, USA). The PCR conditions for GH gene give below:

The target gene	Process	Temperature	Duration
GH gene (3' flanking region, exon V partial and Intron IV)	Denaturation Annealing Extension	94° C 59° C 72° C	30 sec 60 sec 60 sec

Table2.The PCR products (10µl) were digested with restriction enzymes as per the manufacturer's protocol. The reaction mixture was centrifuged for few seconds for uniform mixing and then incubated at 37°C for 12-16 hours in a incubator.

Sl.No	Restriction Enzyme	Source	Recognition Site
1	*Alu I*	*Arthrobacter luteus*	5'…. AG ^ CT… 3' 3'…. TC ^ GA… 5'
2	*Pst* I	*Providencia stuartii*	5'….CTGCA^G…3' 3'….G^ACGTC…5'

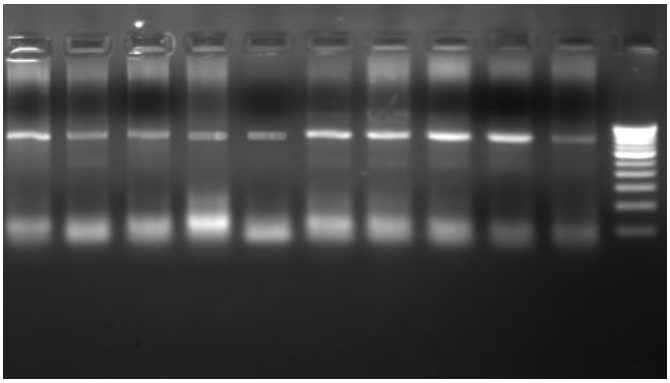

Fig.1 GH gene of 790bp, lane 1-5 from left of Swamp buffalo GH gene, lane 5-10 of yak GH gene & 100bp marker in last lane.

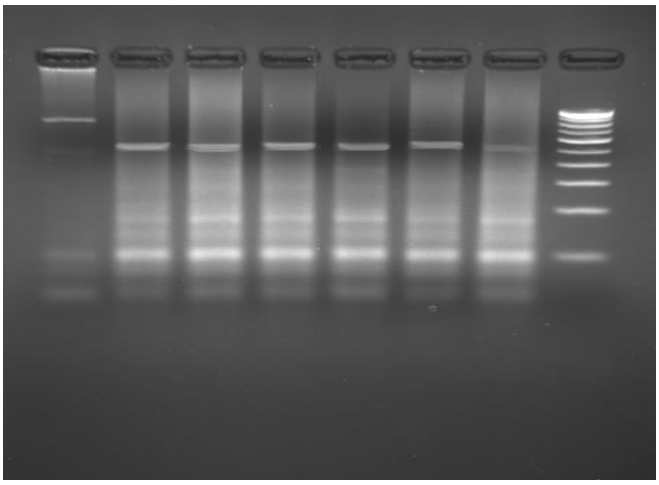

Fig. 2 *Alu I* digestion of GH gene in Swamp Buffalo showing monomorphism.Lane1 PCR product ,Lane 1-6: *Alu I* digested product of size 530, 170 and 100bp ,Lane7 denotes 100bp ladder.

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RESEARCH ARTICLE

The Impact of Implementation of Clinical Governance on Service Quality and Patients' Loyalty in For-Profit Hospitals.

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ABSTRACT

The present study aims to investigate the impact of implementing clinical governance on service quality and patients' loyalty in for-profit hospitals through path analysis method. 224 for-profit hospitals are involved in this investigation. They answer the questionnaires of clinical governance, service quality, patients' satisfaction and patients' loyalty. Path analysis showed that clinical governance has a positive and significant impact on service quality, patients' satisfaction, and patients' loyalty. The coefficients of service quality impact on patients' satisfaction and loyalty are positive and significant. The coefficient of patients' satisfaction impact on patients' loyalty is positive and significant. Indirect effects of clinical governance through service quality and patients' satisfaction on patients' loyalty is positive and significant. Indirect effect of service quality on loyalty through patients' satisfaction is also positive and significant. In general, results of this study focus on the role of clinical governance over service quality, patients' satisfaction and patients' loyalty.

Keywords: Clinical Governance, Service Quality, Patients' Satisfaction, Patients' Loyalty.

INTRODUCTION

In today's world, quality management has challenged organization management methods. Service quality is an important factor for growth, success and sustainability of an organization and it is placed on the agenda of management as a strategic, effective, and comprehensive issue (Daglas, 2006; kiets, 2005).Customers' loyalty is one of the most important issues in present situation. In addition to his constant visit to service provider to buy products or use services, a loyal customer plays an important role in enhancing profitability and improving the company's image in the minds of potential customers. He/she plays the role of an added factor for advertizing products and services through his/her recommendation to relatives, friends or other people (Dadkhah, 2009).

Barrousseau Castro and Martin Armario (1999) argue that loyal customers not only raise the trade value but also enable the business to keep their costs down rather than to attract new customers. Loyalty is a deep commitment to purchase a superior product or service again in the future. It means buying again from a brand or its services in spite of all environmental influences and marketing efforts of competitors to change customers' behaviors (James et al, 2001).Different countries have employed various methods and tools to improve health care quality and patients' loyalty. Clinical governance is one of these methods (Dartnell et al, 2008).Clinical governance is a framework through which health service organisations are accountable for continually improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care will flourish (Anderson et al, 2005). Clinical governance provides a framework covering all quality improvement activities in a harmonious and integrated manner (Belsey& Snell, 2004; Mozafari, Saidi, Pazargadi & Alavi Majd, 2011).

Patient satisfaction is his report on the quality of treatment and the interaction between patient and health care service providers. It may be applied to the responses of service receiver to the provided services that display paitient's overall idea about the quality of services. Generally, patients' satisfaction level is inversely associated with the level of their expectations of the system, so that increasing the level of expectations and anticipations will lead to a reduction in levels of satisfaction (Larson, 2004). Dissatisfaction of customers and clients and their negative advertising may result in the loss or destruction of an organization (Tabibi et al, 2009).In order to enhance the permanent quality of services and upholding the highest possible standards in the organization, clinical governance aims to provide an environment to lead the health professionals regularly and consistently to think about this issue (Mozafari, Saidi, Pazargadi & Alavi Majd, 2011).

Seven elements-model, or seven columns-model, is one of the frameworks in this regard. It includes education and training, clinical audit, clinical effectiveness, risk management, patient's participation, information management, and research and development (Starey, 2001; Broughton, 2003; Hayzadeh et al, 2008).Oliver (1999) defines loyalty as follows, "Loyalty is referred to a strong commitment to repurchase a superior product or service in the future, so that the customer buys the same product in spite of the potential influences and marketing efforts of competitors (Harris et al, 2004).Larson and Susanna (2004) believe: loyalty is the creation of a commitment in customers to deal with a particular organization and to purchase goods and services frequently "(Hart et al, 1999).

Henning-Thurau et al (2002) defined loyalty in relation to commercial brand. In this regard, it leads to the continuous purchase from a particular brand (Henning-Thurau et al, 2002).Loyalty is a strong commitment to repurchase a superior product or service in the future; it means that the customer will buy the same product in spite of the potential influences and marketing efforts of competitors (James et al, 2001).The concept of loyalty emerged in the early 1940s. The concept describes two different meanings including the brand preferences (V) called attitudinal loyalty later and the market share called behavioral loyalty (Zaltman & Deshpande, 1992). Moorman and Zaltman (1992) defined loyalty as the administrative reliance of one party on another party.

In their research, Philips et al (1993) found that the most effective factor in the operation of strategic organizations is the quality of their products and services. They argue that higher qualities lead to higher profits due to higher prices.

Moreover, Basel and Gall state that because of the impacts of quality on customer-perceived value, service quality relates not only to profitability of the organization bu also to the growth of organization. There are other influencing factors on the loyalty of customers like an increase in customers' expectations, competitors' activities, environmental factors, and the nature of services (fitse, 2001: 42).In their investigation, Hojat et al (2010) examine the 'Staffs and patients' satisfaction as an indicator of the quality of services'; the results of the investigation led to offering a comprehensive program for assurance of service quality. Mosavi (2011) studied 'the role of clinical governance in realization of patients' rights'. The results of the study indicates that the lack of consensus for the compilation of broad and functional health indicators, insufficient monitoring, lack of right reporting by governments, and inconsistency and lack of data result in emergence of personal ideas in this field.

Chen (2007) examined 'the relationship between the quality of health services and the loyalty of patients.' The results of this study showed that the quality of health services is the most influencing factor on the loyalty of patients. In addition, quality improvement not only leads to the increase of patients' satisfaction but also enhances patients' loyalty, and patients receive better quality medical treatments. It is noted that long-term relationships of patients with a hospital improve credibility and reputation of the hospital. Arasli and Ekiz (2008), in their study on the quality of services presented by Cypriot governmental and non-governmental hospitals, find that in order to improve customers' loyalty, the managers of hospitals should raise their employees' job satisfaction through enhancing satisfaction among their employees. Moreover, they can act more effective towards patients' complaints with receiving systematic feedback from the patients.

METHODOLOGY

Statistical Population and Samples

The present study collects data relating to the satisfaction level of 244 patients for six months of referring to a hospital. Samples were selected based on Cochran's formula. Sampling was implemented through random sampling. According to population size, Cochran's theorem was used to determine the number of samples.

$$n = \frac{Nt^2s^2}{Nd^2 + t^2s^2}$$

In this formula:
t = the percentage of standard error of acceptable confidence
d = degree of confidence or potential efficiency
s = proportion of the population lacks certain traits
N = number of individuals in society

$$n = \frac{670\ (1/95)^2(0/5)^2}{670(0/05)^2+(1/96)^2(0/5)^2} =$$ =244

Measuring variables are clinical governance, service quality, patients' satisfaction, and patients' loyalty. Standard questioners were used to assess each of the variables of service quality, patients' satisfaction, and patients' loyalty. Some structured questionnaires were used for measuring clinical governance, which are discussed in the following lines.

Clinical Governance

The structured questionnaire measuring clinical governance consists of 14 questions. Reliability and validity of the questionnaire were examined using Cronbach's alpha coefficient and confirmatory factor analysis.

Service quality

To collect data to measure service quality SERVQUAL questionnaire (1988) was used to assess the components of physical condition, reliability, staffs' responses, service assurances and empathy.To measure patient satisfaction, a questionnaire was developed by using previous questionnaire that has been developed to measure customer satisfaction in Switzerland, Malaysia, Europe and America.

Patients' Loyalty

To measure patients' loyalty, a questionnaire was developed based on betnkurt's questionnaire (1997), Izgenrich and Bell questionnaire (2007), Erdom et al questionnaire (2006), and Bill and Eva questionnaire (2013). The questionnaire has eight questions grading according to the five-degree Likert range from very low (1) to very much (5). The following formula was used to determine the validity:

$$r_{\alpha} = \frac{J}{J-1}\left(1 - \frac{\sum_{j=1}^{n} s_j^2}{S^2}\right)$$

Where:
J = the number of subsets in the questionnaire
S_j^2 = Jth subset variance
S^2= Total variance of test or questionnaire (Sarmad & Hejazi, 2001).
To check the validity of the measuring instrument, confirmatory factor analysis was used in addition to content analysis of tools that were examined in the previous section.

RESULTS AND DISCUSSION

Figure 1 shows the frequency related to sex. The results indicate that 59.84 percent of respondents are male and 40.16 percent of the respondents are women.Figure 2 shows the distribution of respondents by age. In this regard, below 20 years old samples are 8.61 percent, between 20 to 30 years old are 18.44 percent, between 30 to 40 years old are 38.93 percent, and more than 40 years old samples are 34.02 percent.Table 1 shows the fitting parameters scale of clinical governance. According to lisrel output in table 1, the estimated $\chi 2/df$ is 2.04, and $\chi 2/df$ below 3 proves the goodness of fit model.Table 2 shows the fitting parameters scale of patients' satisfaction. According to lisrel output in table 2, the estimated $\chi 2/df$ is 1.89, and $\chi 2/df$ below 3 proves the goodness of fit model. In addition, root mean square error of approximation (RMSEA) should be less than 0.08, which is 0.061 in the presented model. Indices GFI, AGFI, CFI, and NFI should be greater than 0.9, which are greater than the determined rate. Therefore, the research data fit properly to the factor structure of the scale; it depicts the alignment of questions with the patients' satisfaction.

According to Table 3, the estimated $\chi 2/df$ is 1.72, and $\chi 2/df$ below 3 proves the goodness of fit model. In addition, root mean square error of approximation (RMSEA) should be less than 0.08, which is 0.054 in the presented model. Indices GFI, AGFI, CFI, and NFI should be greater than 0.9, which are greater than the determined rate. Therefore, the research data fit properly to the factor structure of the scale; it depicts the alignment of questions with the patients' loyalty.The results of fit indices of customers' trust in table 4 indicate that CFI, GFI, NFI, RMR, and RMSEA are at an acceptable level of fit; it implies the goodness of fit indices. The research data fit properly to the factor structure of the scale; it depicts the alignment of questions with the patients' loyalty.

Descriptive Indicators of Research Variables

Table 5 reports descriptive indices of the research variables including mean and standard deviation.

Normality Test of Variables

Kolmogorov - Smirnov test was used to evaluate the normality of variables. Test results are reported in Table 6. The obtained results show that the Kolmogorov-Smirnov test is not significant for any of the variables and all the variables are normal.

Correlation coefficient

After confirming the validity measurement tools, the next step in this path analysis is to identify the relationship between the variables. Pearson's correlation coefficient was used to identify the relationship between the variables of model. The results of the correlation coefficient between variables are listed in Table 7. They show that the correlation coefficients of patients' loyalty with clinical governance (r=0.29), service quality (r=0.61) and patients' satisfaction (r=0.72) are significant at the level of $p<0.01$ and a positive relation exists between them. The correlation coefficients of clinical governance with service quality (r=0.42) and patients' satisfaction (r=0.23) are significant at the level of $p<0.01$. The correlation coefficients of service quality with patients' satisfaction (0.55) are significant at the level of $p<0.01$.Figure 3 lists the tested model in addition to standardized rates on each of the paths. Results indicate that the path coefficients are significant and have positive impact on each other. In the following, the presented hypotheses will be examined.

Since this study aims to investigate the mediating role of service quality and patients' satisfaction among variables of clinical governance and patients' loyalty through path analysis method, table 8 is useful to evaluate the coefficients of direct, indirect and total effects, explained variances, and the significant level of variables.

Testing the proposed hypotheses

The results related to direct, indirect and total effects are listed in table 9. The first research hypothesis says clinical governance has an impact on the quality of services. Table 9 indicates that the impact factor of clinical governance on the services quality (β=0.39) is positive and significant at the level of $p<0.01$. Consequently, the first research hypothesis is confirmed and clinical governance has a positive effect on the service quality.The second research hypothesis says clinical governance has an impact on patients' satisfaction. Findings show that clinical governance has a positive and significant impact on patients' satisfaction with the impact factor equals to 0.29. Consequently, the second research hypothesis is confirmed.The third research hypothesis claims that clinical governance has an impact on patients' loyalty. Findings of table 9 show that the impact factor of clinical governance on the patients' loyalty equals β=0.39 and it has a positive and significant impact at the level of $p<0.01$. Consequently, the third research hypothesis is confirmed and clinical governance has a positive effect on patients' loyalty.

The fourth research hypothesis states that service quality has an impact on patients' satisfaction. The results of path analysis (table 9) indicate that service quality has a positive and significant impact on patients' satisfaction with the impact factor of 0.51. Therefore, the fourth hypothesis is confirmed.The fifth research hypothesis declares that service quality has an impact on patients' loyalty. Findings indicate that the impact factor of service quality on the patients' loyalty equals β=0.34 that is positive and significant at the level of $p<0.01$. Thus, the fifth research hypothesis is confirmed and service quality has a positive and significant impact on patients' loyalty.

The sixth research hypothesis says patients' satisfaction has an impact on patients' loyalty. The results show that the coefficient influence of patients' satisfaction on patients' loyalty equals 0.47 and it is statistically significant at alpha level of 0.01. Therefore, the sixth research hypothesis is confirmed.The results of table 9 show that service quality and patients' satisfaction play mediating roles in relation between clinical governance and patients' loyalty and clinical governance influence them indirectly through patients' loyalty. Moreover, clinical governance influences indirectly on patients' satisfaction through service quality.Another finding in Table 9 is that patients' satisfaction plays

mediating roles in relation between service quality and patients' loyalty. Accordingly, service quality influences on patients' loyalty through patients' satisfaction.As seen in Table 9, 44 percent of patients' satisfaction variance and 15 percent of service quality variance are explained by the variables considered by this model of study.Nevertheless, fitness characteristics of tested model in table 10 shows that RMSEA has the acceptance level of 0.057 in the fitted model. Other characteristics like CFI, GFI, NFI, NNFI and AGFI are respectively equal to 0.96, 0.96, 0.93, 0.95, and 0.93, which means they are at proper levels; this fitness characteristic of goodness reveals that the research data fit properly to the factor structure of the scale.

CONCLUSION

First hypothesis: clinical governance has a direct impact on the quality of services in health care institutions.

Research findings related to this hypothesis suggests that the impact factor of clinical governance on service quality equals 0.39 that is positive and significant at the level of P<0.01. The report of examined β indicates that implementation of clinical governance has positive and significant impact on service quality. The results of the present study are in line with findings of Mosavi (2011) and Dehnavi & Markazi Moghadam (2013). Mosavi (2011) shows in his research that clinical governance is an essential tool and infrastructure for realization of patiens' rights. It is operated through four elements (consumers' value, clinical audit, risk management, and research and development) in order to measure patients' satisfaction, manage complaints, reduce clinical errors, and improve quality of services. Moreover, and Dehnavi & Markazi Moghadam (2013) proves that clinical governance acts as a criterion in current situation analysis and relevant assessments by providing a comprehensive framework and stating components; it leads to providing high quality services to patients.

Given that patient is the center of service delivery and all activities are performed to improve treatment outcomes, patients' satisfaction and his favor, implementation of clinical governance has positive and direct influence on the quality of services offered in health care institutions. Clinical governance creates some outputs through its four elements; the outputs pave the way for improvement of service quality in a mediator perspective between clinical governance and service quality.

Second hypothesis: implementation of clinical governance has a direct impact on patients' satisfaction.

Research findings related to this hypothesis suggests that clinical governance has a positive and significant impact on patients' satisfaction with a impact factor of 0.29.The report of examined β indicates that implementation of clinical governance has impact on patients' satisfaction. Research findings in this regard are in agreement with the findings of Hojat et al (2010), Brice White and Travajelia (2008), and Spark and Ravo (2004). These investigations study the effective aspects of clinical governance and its principles, which prove the positive impact of clinical governance on patients' satisfaction. In clinical governance system, patients and customers are place at the center of processes; all parts of the system try to to provide high quality services complying with standards by improving work standards, learning from past experiences, empowering employees and teams, and making effective use of information. Therefore, implementation of clinical governance system in health care institutions results in the enhancement of patients' satisfaction.

Third hypothesis: implementation of clinical governance has a direct impact on patients' loyalty.

Regarding the third research hypothesis about the impact of clinical governance on patients' loyalty, the results show that the impact factor of clinical governance on patients' loyalty is positive and significant at the level of P<0.01. This claim is consistent with studies carried out by Tabibi et al (2012), Mosavi (2011), and Ferguson et al (2006). These researches evaluate the implementation of clinical governance and patients' loyalty leve. They display that general treatment, care, food quality, waiting time, service availability, physical facilities, and and information are effective in

the level of patients' loyalty. As clinical governance is implemented effectively and efficiently, patients' loyalty will increase. Implementation of clinical governance is the presentation of a framework through which health service organisations are accountable for continually improving the quality of their services and safeguarding high standards of care. Clinical governance pays its attention simultaneously on accountability to maintain the current level of care and quality of future cares. It seeks to integrate techniques of measuring and improving quality of care, which results in the further loyalty of patients.

Fourth hypothesis: service quality has an impact on patients' satisfaction.

The results of path analysis disclose that service quality has a positive and significant impact factor on patients' satisfaction. It is compatible with Hojat et al (2010) and Lee et al (2010). This finding shows that some factors have impact on patients' satisfaction; the factors are cleaning and cleanliness of the hospital environment, proper medical equipments, adorned appearances of doctors and staffs of hospital, enough spent time to receive services, and employees' interest to do the work and provide services for patients. Other factors are detailed information about the business and affairs of the hospital and patients, compliance with the commitments, providing on time services, maintenance of relating records to patients, quick responses to resolve the issues surrounding the treatment, doctors' enough attentions to patients, and announcing the exact time of service. These factors are followed by doctors' desirable social behaviors in dealing with patients, and staffs' desirable social behaviors in dealing with patients, patients' trust to the medical team, sense of security and comfort in dealing with employees, particular attention to patients' emotions and values, appropriate working hours of the institution for patients' referral, and understanding patients' expectations. Therefore, one can say that service quality is an essential factor in realization of patients' satisfaction because it clearly affects the customers' responses. However, service quality, satisfactions, and perspectives are important factors in in customer support.

Fifth hypothesis: service quality has an impact on patients' loyalty.

Research findings indicate that impact factor of service quality on patiets' loyalty is significant and positive. The findings are corresponding to researches carried out by Bidokhti et al (2011), Tabibi et al (2012), and Chen (2007). The outcomes show if services are appropriately presented and they influence positively customers' opinion towards the quality of services, the rate of customers' commitment and loyalty to the hospital will increase considerably. In explaining these findings, one can say that customers' attitude toward presented services is an influencing factor in formation of customers' loyalty. Doing so, staffs committing to the organization and providing high quality services are playing a crucial role in customers' satisfaction and their loyalty. As customers and users are constantly seeking to find better service and goods, the managers of hospitals should pay special attention to the role of staffs and employees in affording service quality, patients' satisfaction, and customers' loyalty. In general, it can be concluded that service loyalty results in the enhancement or detraction of customers' loyalty. In this regard, the ability to implement and provide promised services in appropriate, precise, and reliable ways, reliable presentation of services, and dealing effectively with customers increase patients' loyalty to a hospital.

Sixth hypothesis: patients' satisfaction has an impact on patients' loyalty.

Results of this research signals the positive and significant influence of patients' satisfaction on patients' loyalty. The findings suggest that patients will be more loyal to a hospital when customers are satisfied with hospital services, their expectations are met, they have a satisfactory experience of hospital services, hospital buildings and physical facilities are appropriate, and staffs and doctors deal with patients in a warm and intimate atmosphere. Other influencing factors are the detailed presentation of information on services by employees, accountability of staffs, being committed for solving problems, providing on time services, and offering proper and high quality services. Therefore, satisfaction is happiness resulted from the knowledge of a convenient atmosphere interrelated to contentment of some specific desires. If individuals achieve their desired goals and aspirations and they are satisfied in this way, they will feel such happiness and their loyalty to the services of hospital will increase (Payandani, 2007).

It should always be noted that the only way to maintain customers is the fulfillment of their needs, demands and expectations, or providing their satisfaction. The management theorist, Simon, says, "When an organization is successful in attracting a new customer, the customer's satisfaction is the point of establishing a long term relationship between the customer and the organization" (Tsoukatos et al, 2006).

The results obtained from the fitted model suggest:From mediator variables (patients' satisfaction and service quality), patients' satisfaction has the most direct and positive impact on patients' loyalty.Among research variables that influence patients' loyalty indirectly, clinical governance allocates the most indirect impact. Since the indirect influence of clinical governance on patients' loyalty is carried out through patients' satisfaction and service quality, one can assert patients' satisfaction and service quality play mediating role between clinical governance and patients' loyalty. In addition, service quality influence indirectly on patients' loyalty through patients' satisfaction. Regarding the rate of explained variance for research variables, the conclusion is that the highest rate of explained variance relates to patients' loyalty (0.44 %). It is reasonable to claim that patients' loyalty is under the influence of more factors because the rate of explained variance for patients' loyalty is 0.44 %.

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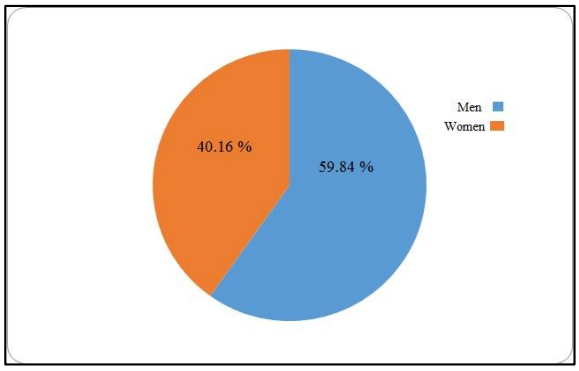

Figure 1.Frequency of Sex

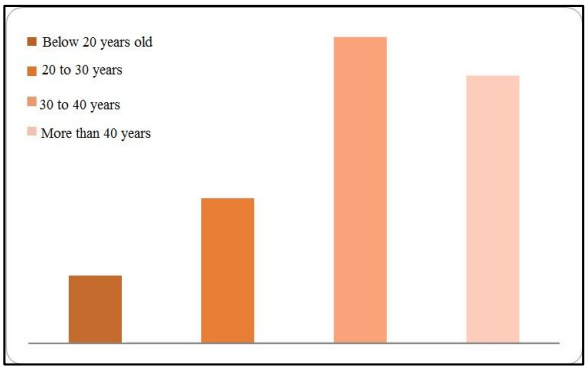

Figure 2.Distribution of respondents by age

Table 1: Fitting parameters scale of clinical governance

Parameters	Estimation
Ratio of chi square to its degrees of freedom ($\chi 2/df$)	2.04
Root Mean Square Error of Approximation (RMSEA)	0.066
Goodness-of-fit index (GFI)	0.94
adjusted goodness of fit index (AGFI)	0.88
Comparative Fit Index (CFI)	0.97
Normalized Fit Index (NFI)	0.95

Table 2: Goodness of fit indices of patients' satisfaction

Parameters	Estimation
Ratio of chi square to its degrees of freedom ($\chi 2/df$)	1.89
Root Mean Square Error of Approximation (RMSEA)	0.061
Goodness-of-fit index (GFI)	0.92
adjusted goodness of fit index (AGFI)	0.89
Comparative Fit Index (CFI)	0.97
Normalized Fit Index (NFI)	0.94

Table 3: Goodness of fit indices patients' loyalty

Parameters	Estimation
Ratio of chi square to its degrees of freedom (χ2/df)	1.72
Root Mean Square Error of Approximation (RMSEA)	0.054
Goodness-of-fit index (GFI)	0.97
adjusted goodness of fit index (AGFI)	0.94
Comparative Fit Index (CFI)	0.99
Normalized Fit Index (NFI)	0.97

Table 4: Goodness of fit indices service quality

Parameters	Estimation
Ratio of chi square to its degrees of freedom (χ2/df)	1.13
Root Mean Square Error of Approximation (RMSEA)	0.033
Goodness-of-fit index (GFI)	0.99
adjusted goodness of fit index (AGFI)	0.97
Comparative Fit Index (CFI)	0.99
Normalized Fit Index (NFI)	0.99

Table 5: Descriptive indices of the research variables

Variables	Mean	Standard deviation
Clinical governance	52.88	9.68
Patient satisfaction	75.89	13
Service quality	43.45	9.79
Patient loyalty	28.22	6.70

Table 6: Results of the Kolmogorov-Smirnov test.

Variables	Kolmogorov-Smirnov	Significance level
Clinical governance	1.17	0.13
Patient satisfaction	0.72	0.16
Service quality	1.12	0.68
Patient loyalty	1.03	0.24

Table 7: Correlation matrix of research constructs

Variables	Clinical governance	Service quality	Patient satisfaction	Patient loyalty
Clinical governance	1			
Service quality	0.42**	1**		
Patient satisfaction	0.23**	0.55**	1	
Patient loyalty	0.29**	0.61**	0.72**	1

* P<0.05; ** P<0.01

Table 8: Cronbach's alpha coefficients of the variables in the study

Variables	Cronbach's alpha coefficient
Clinical governance	0.84
Service quality	0.87
Patient satisfaction	0.85
Patient loyalty	0.83

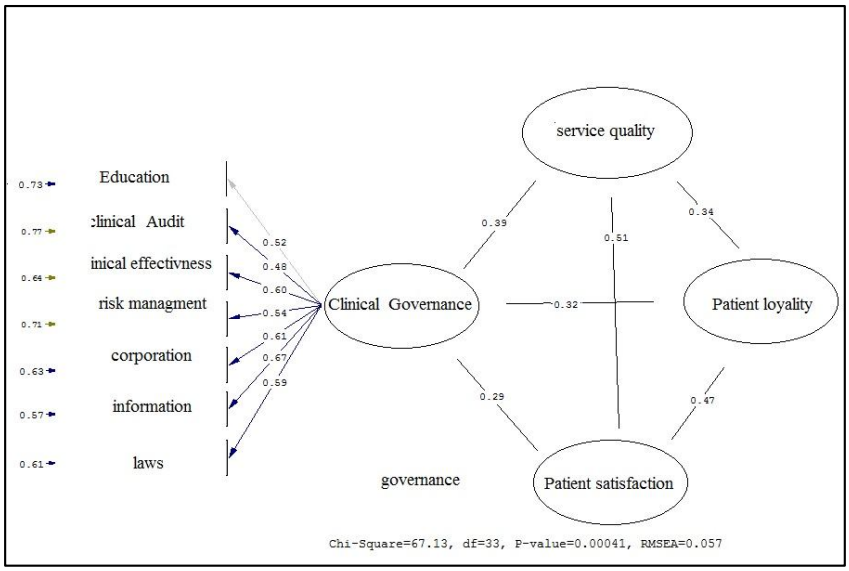

Figure 3: Tested model (* p < 0.05; ** p < 0.01)

Table 9: Results of direct, indirect and total effects

Path	Direct impact	Indirect impact	Total impact	Explained variance
On patients' loyalty from				44%
Patients' satisfaction	0.47**	-		0.47**
Service quality	0.34**	0.24**		0.58**
Clinical governance	0.32**	0.36**		0.68**
On patients' satisfaction from				34%
Service quality	0.51**	-	0.51**	
Clinical governance	0.29**	0.20**	0.49**	
On Service quality from				15%
Clinical governance	0.39**	-	0.39**	

* p < 0.05 ** p < 0.01

Table 10: Fitness characteristics of fitted model

x/df	RMSEA	CFI	GFI	NNFI	NFI	AGFI
2.03	0.057	0.96	0.96	0.95	0.93	0.93

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RESEARCH ARTICLE

Studies on Storage Parameters for CO 4 Onion Bulb (*Allium cepa* L. var. *aggregatum* Don.) in Room Temperature.

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ABSTRACT

CO 4 onion bulbs were cured at different curing temperatures, control (Sun curing) and were stored at room temperature storage in gunny bag.Time taken for curing of fresh onion bulb from an initial moisture content of 566.62 (% db) to a final moisture content 510.45 per cent (db) was 8 hours at 45°C curing temperature. The moisture content was reduced by 1-2 percent (wb) from fresh to cured onion bulbs.The skin of the onion bulb's moisture content was reduced to an amount of 10 per cent from the initial moisture content after curing. Minimum physiological loss in weight (27.57 %), rotting (0.56 %), skinning (0.27 %), TSS (16.12 °Brix) and maximum colour value (a*(-)14.29), pyruvic acid content (5.12 µmol/g) was found at 45°Cafter 90 days of room temperature storage. Sprouting was not observed in the room temperature storage.

Key Words: Curing,PLW, rotting, sprouting, skinning and pyruvic acid.

INTRODUCTION

In India, onion is the fourth most important commercial vegetable crop cultivated in an area of 5.93 lakh hectares which is about 10 per cent of total area under vegetable cultivation. The production of onion (Bellary and Small) in the country is 7.52 million Metric Tonne accounting for 8.9 per cent of the total vegetable production. Small onion (*Allium cepa* L.var. *aggregatum* Don.) is produced only in southern states of India, viz., Tamilnadu, Andhrapradesh and Karnataka. It constitutes more than 75 per centof onion production in Tamilnadu [1].The small onion bulbs ranks medium in

calorific value, low in protein and very low in vitamins. Non-structural carbohydrates consisting of free sugars, trisachharides and fructans, contribute the major portion of the dry weight of onion.Curing extends the storage life of the onion bulbs. Onions should not be stored unless adequately cured either in the field or by artificial means. It is necessary to dry the neck tissue and outer scales until they rustle when handled, otherwise the bulbs will rot during storage. The major concern in onion growing is the huge losses (sprouting, rotting and physiological loss in weight) of bulbs encountered during its post-harvest stage. Lack of adequate storage facilities and high price fluctuations are recognized as the most important constraints to onion and onion losses are in the range of 60–70 per cent of initial bulb weight after three months of storage [2]. The bulbs are usually stored until the harvest of next season crop or for longer period due to seasonal glut in market. Hence, a study was undertaken to determine the effect of curing and storage period of the onion bulbs at room temperature storage on shelf of onion bulbs.

MATERIALS AND METHODS

The CO 4 onion cultivar is the most preferred variety for cultivation in Tamilnadu. It is a short duration (nearly three months) variety as compared to CO (On) 5 variety (5 months).CO 4 was developed and released by the Tamil Nadu Agricultural University, Coimbatore. It is composed of 3-4 bulbs of onion joined together. It is red in colour and spherical in shape. It is a high yielding variety with recorded productivity of 20 tonnes/ha and with a crop duration of 65 days. Freshly harvested and three months stored CO 4 bulbs were brought from farmer's field. Shoot and root were removed and bulbs were separated from the multiplier (bunch) and cured in the cabinet dryer. Cured onion bulb was taken in gunny bags placed at room temperature for storage studies of onion bulbs. The average value of temperature (37.30 to 26.90°C) and relative humidity (89.70 to 51.60 %) was measured during room temperature storage.

Storage Studies

The following observationswere recorded on onion bulbs during the period of storage. Physiological loss in weight (%), sprouting (%), rotting (%), skinning (%), colour value (a*), Total soluble solids (°Brix), and pyruvic acid (µmolg^{-1}) were recorded at weekly intervals up to 90 days of storage. The details of the methodology adopted for recording these observations during experimentation are described below.

Physiological loss in weight (%)

Weight loss during storage may be due to physiological reasons like dehydration and respiration and also due to rotting and rat damage.The physiological loss in weight of the bulbs was recorded on weekly intervals using an electronic balance. The cumulative loss in weight of bulbs was calculated and expressed as per cent physiological loss in weight using the formula given below [3].

$$PLW\ (\%) = \left(\frac{P_0 - P_F}{P_0} \right) \quad \ldots (1)$$

Where

P_0 - Initial weight of the storage onion bulb (First day of storage)

P_F - Final weight of the stored onion bulb (after 90th days of storage)

Sprouting percentage

For determining the sprouting percentage on stipulated days after storage, the bulbs showing a sprout were separated from the bag/basket and weighed on an electronic balance. The sprouting percentage, which indicated the weight of the bulbs sprouted on days after storage was calculated by using the formula given below.

$$\text{Sprouting percentage (\%)} = \left(\frac{\text{Weight of sprouted onion bulbs}}{\text{Initial weight of onion bulbs}} \right) \times 100 \quad \ldots (2)$$

Rotting percentage

The weight of the rotted bulbs at the end of storage period was recorded and calculated by using the formula.

$$\text{Rotting percentage (\%)} = \left(\frac{\text{Weight of the rotted onion bulbs}}{\text{Initial weight of onion bulbs}} \right) \times 100 \quad \ldots (3)$$

Skinning percentage

Dried loosened scales were separated from the cured/stored onion bulbs. The same bulbs were used for observation at different days of storage. Per cent scales were computed by the formula given below.

$$\text{Skinning percentage (\%)} = \left(\frac{\text{Weight of the loosened skin}}{\text{Initial weight of onion bulbs}} \right) \times 100 \quad \ldots (4)$$

Total soluble solids

The total soluble solids are primarily sugars like sucrose, fructose and glucose. Tartaric acid and minerals in the juice also contribute to the soluble solids. The total soluble solids present in the onion were determined by using pocket refractometer PAL-1 (ATAGO) with a range of 0-53 °Brix. Known quantity of onion bulbs were crushed by using pestle and mortar. The crushed juice was put into the refractometer directly. The value was showed in the digital display and noted the value in per cent or degree brix.

Colour

Colour flex meter (Hunter Associates Laboratory, Inc., model: 65/10°) has been used for the measurement of colour of the grapes and raisins. It works on the principle of collecting and measuring the energy from the samples reflected across the entire visible spectrum. The Hunter lab's colour flex spectro colorimeter is a versatile, compact colour measuring instrument consisting of measurement (sample) port, opaque cover and display unit.

Colour parameters were expressed as L* describing lightness (L*= 0 for black, L* = 100 for white), a* describing intensity in green-red (a* < 0 for green, a* > 0 for red), b* describing intensity in blue – yellow (b* < 0 for blue, b* > 0 for yellow). The onion samples were placed in the colour flex meter and a* values were measured [4].

Pyruvic Acid

Pyruvic acid or pyruvate is an important metabolic intermediate. It is greatly produced in the terminal step of glycolysis and funnels to TCA (Tri Carboxylic Acid) cycle for further oxidation for releasing the chemical energy. The DNPH(2,4-dinitrophenyl hydrazine) reacts with pyruvate after the addition of NaOH giving a brown colored hydrazone product which can be estimated colorimetrically at 510 nm.Six gram of bulbs was taken and ground in pestle and mortar with 15 ml of phosphate buffer. The extract was centrifuged at 25,000 rpm for 15 minutes and the supernatant was used as a plant extract [5].The standards were prepared by pipetting out 50, 75, 100,150 and 200 µl of pyruvate standard solution and 0.5, 1.0, 1.5, and 2.0 ml sample extract into test tubes and then the volume was made up to 2.0 ml in all the test tubes including samples by adding phosphate buffer. A blank solution was also run. About 0.5 ml of DNPH solution was added to all the test tubes and incubated at 37°C for 30 minutes. After

incubation, 5 ml of NAOH solution was added to all the test tubes, mixed well and incubated for 10 minutes at room temperature. Absorbance of each sample was recorded at 510 nm at spectrophotometer. A standard graph was drawn, the amount of pyruvic acid present in the sample was calculated using the graph and the value expressed in $\mu molg^{-1}$.

RESULTS AND DISCUSSION

CO 4 onion bulbs were cured at different curing temperatures,control (Sun curing) and were stored at room temperature storage in gunny bag.The average value of temperature (37.30 to 26.90°C) and relative humidity (89.70 to 51.60 %)ofatmospherewas measured during room temperature storage. The results of curing temperatures and room temperaturestorageof onion bulbs and their effects on physiological loss in weight, sprouting, rotting, skinning, colour, TSS and pyruvic acid were presented.

Effect of curing temperature on physiological loss in weight at room temperature storage

The variation in physiological loss in weight of cured samples at different curing temperature during room temperature storage is presented in Table 1. The maximum physiological loss in weight was observed as 33.49 and 27.57 per cent after 90 days of storage for control sample (sun curing) and 45°C cured sample. Minimum physiological loss in weight (1.59 %) was observed when cured at 45°C sample after 15 days.In general, the physiological loss in weight was higher in sun curing sample compared with the all other curing temperature sample. This may be due to absence of foliage resulting in full expose of the bulbs to the radiant temperature leading to increased surface temperature of the bulbs helping to hasten the process of moisture reduction [3].

Among the curing temperature, the physiological loss in weight was found to be less at higher curing temperature (45°C). Since, the continuous heated air flow reduces the time intervals and proper curing of the outer scales and tightens the neck. This may prevent further escape of moisture from the bulb and thus reduced the weight loss during storage [6].Thestatistical analysis (ANOVA), it was found that their interactions effect on curing temperature and storage periods are significant at 1 percent level.

Effect of curing temperatureon rotting percentage at room temperature storage

The variation in rottingpercentage of cured samples at different curing temperature during room temperature storage is presented in Table 2. The maximum value of rotting was observed as 0.89 per cent after 90 days of storage for control (sun curing) sample. Minimum rotting (0.05 %) was observed when cured at 45°C on 45 days of storage of samples.Among the curing temperature, the rotting percentage was less in the 45°C curing temperature. This may be due to the fact that the neck of the bulb was completely dried and closed which helps in reducing the chances of microorganism entry into the bulbs and lower order of pathological decay of microorganisms due to reduction in the moisture content of the onion bulbs [7]. Similar result was observed for the Hessian cloth bag of cured sample cv.N-2-4-1 variety onion bulb [8].

Effect of curing temperature on skinning at room temperature storage

The variation in skinning percentage of samples at different curing temperature stored in gunny bag in room temperature is presented in the Table 3. The maximum and minimum value of skinning for the sample was 1.30 and 0.05 per cent after 90 days of storage and 30 days of storage for control sample (sun curing) at 45°C cured sample.In general, the maximum skinning was higher in control sample. This may be due to the higher temperature fluctuation at room conditions. Similar trendobserved incuring was less during50 per cent shade (15 days) + tops removed 15 days after harvest at 30 days of storage [3].

Effect of curing temperature on colour at room temperature storage

Fig.1 shows the variation in colour (a*) of the cured samples at different curing temperature in room temperature storage. The maximum and minimum colour value of sample and was observed as 14.91 and 11.34 for 15 and 90 days of storage, for the sample cured at 45°C and control sample respectively.The colour value was gradually reduced throughout the storage period at all the curing temperatures and control sample.In general, the colour value was higher at 45°C after 15 days of storage period compared with other curing temperatures. This may be due to changes in biochemical composition of skin color. Onion colour changes due to a difference in flovonol and anthocyanin glucoside concentration found in the skin tissue [9].

Effect of curing temperature on total soluble solids (TSS) at room temperature storage

The variation in total soluble solids cured at different curing temperatures at room temperature storage is presented in fig.2. The maximum TSS of sample was observed as 17.3 °Brix for all the curing temperatures and control sample also. The minimum TSS of control sample was observed as 16.12 °Brix for 90 days of storage.From the graph,the TSS was gradually decreased throughout the storage period at all the curing temperature for stored onion bulbs. This may be due to fluctuation of temperature and relative humidity which might have reduced the rate of respiration of the sample in turn would have regulated the biochemical changes leading to decrease of the total soluble solids [10]. Among the curing temperature, when cured at 45°C, the TSS of the bulbs was higher due to surface drying of onions leading to rigid and firm bulbs. This may be due to the reduction of moisture which leads to decrease in TSS at room temperature storage [11].

Effect of curing temperature on pyruvic acid contentat room temperature storage

The variation in pyruvic acid content of onion bulb cured at different curing temperatures at room temperature storage is presented in Table 4. The minimum pyruvic acid content was observed as 4.67µmol/g for the initial sample for all the curing temperatures and the control sample. The maximum pyruvic acid content of sample was observed as 5.12 µmol/g for the sample cured at 45°C after 90 days of storage. In general, an increment of pyruvic acid content was observed throughout the storage period at all the curing temperature in room temperature stored sample. This may be due to higher degradation of flavoring compounds [12]. Among the curing temperatures, the pyruvic acid content was found to be high when cured at 45°C, since at higher curing temperature, the higher activity of Alliinase enzyme which causes higher degradation of flavoring precursor compounds [13]From the ANOVA, it was found that the variable and their interactions viz., curing temperature and storage days are significantly influenced at 1 per cent level. The interaction between the curing temperature and storage day at room temperature storage and low temperature storage was found to be significant.

CONCLUSION

CO 4 onion bulbs were cured at different curing temperatures, control (Sun curing) and were stored at room temperature storage in gunny bag.Time taken for curing of fresh onion bulb from an initial moisture content of 566.62 (% db) to a final moisture content 510.45 per cent (db) was 8 hours at 45°C curing temperature. The moisture content was reduced by 1-2 percent (wb) from fresh to cured onion bulbs.The skin of the onion bulb's moisture content was reduced to an amount of 10 per cent from the initial moisture content after curing. Minimum physiological loss in weight, rotting, skinning, TSS and maximum colour value, pyruvic acid content was found at 45°C after 90 days of room temperature storage. Sprouting was not observed in the room temperature storage.

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Table 1. Effect of curing temperature on physiological loss in weight (%) at room temperature storage

Curing temperature	Physiological Loss in Weight (%)					
	Storage period (Days)					
	15	30	45	60	75	90
Control (sun curing)	4.09	8.53	14.06	19.36	25.86	33.49
35 (°C)	3.95	7.16	12.09	18.13	24.41	31.12
40 (°C)	2.43	5.74	9.97	15.44	21.83	29.24
45 (°C)	1.59	4.11	8.42	12.87	19.72	27.57

Table 2. Effect of curing temperature on rotting at room temperature storage

Storage period (DAS)	Rotting (%)			
	Curing temperature			
	Control	35 (°C)	40 (°C)	45 (°C)
15	-	-	-	-
30	-	-	-	-
45	0.49	0.50	0.45	0.05
60	-	-	-	-
75	-	-	-	-
90	0.89	0.64	0.60	0.56
Avg.	**0.69**	**0.57**	**0.53**	**0.31**
SD	**0.28**	**0.10**	**0.10**	**0.36**
CV (%)	**0.41**	**0.17**	**0.20**	**1.18**

Table3. Effect of curing temperature on skinning percentage at room temperature storage

Storage period (DAS)	Skinning (%)			
	Curing temperature			
	Control	35 (°C)	40 (°C)	45 (°C)
15	-	-	-	-
30	0.05	0.03	0.16	0.04
45	-	-	-	-
60	-	-	-	-
75	0.81	0.55	0.31	0.26
90	1.30	0.98	0.88	0.51
Avg.	**0.72**	**0.52**	**0.45**	**0.27**
SD	**0.63**	**0.48**	**0.38**	**0.23**
CV (%)	**0.88**	**0.92**	**0.84**	**0.86**

Table 4.Effect of curing temperature on pyruvic acid content (µmol/g) at room temperature storage

Curing temperature	Pyruvic acid content (µmol/g)						
	Storage period (Days)						
	0	15	30	45	60	75	90
Control (sun curing)	4.67	4.70	4.72	4.76	4.80	4.87	4.98
35 (°C)	4.67	4.73	4.75	4.79	4.84	4.92	5.03
40 (°C)	4.67	4.74	4.78	4.82	4.89	4.98	5.07
45 (°C)	4.67	4.76	4.81	4.86	4.94	5.03	5.12

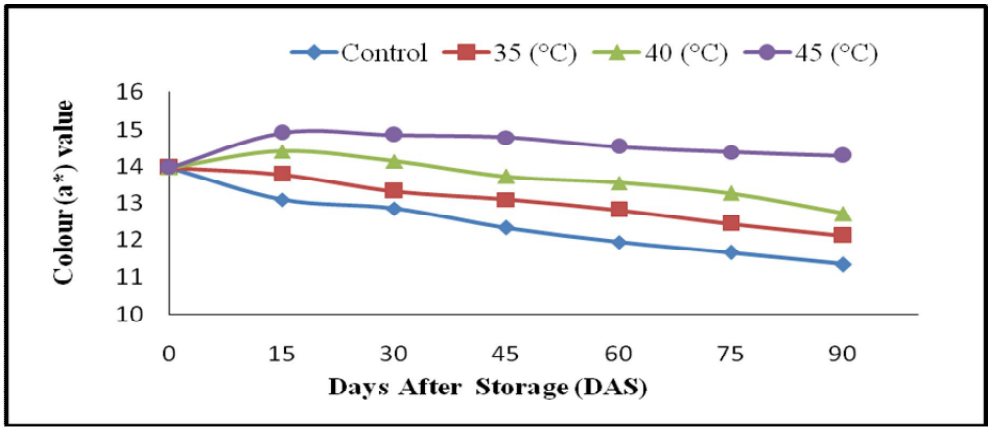

Fig.1. Effect of curing temperature on colour (a*) at room temperature storage

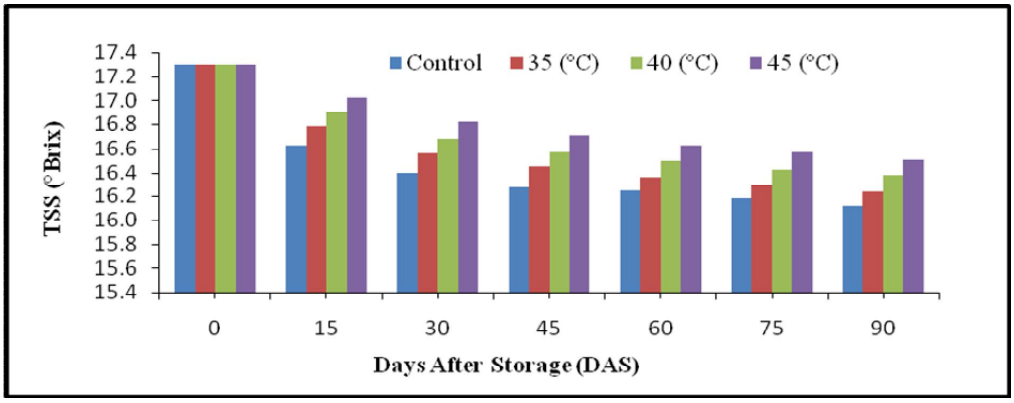

Fig. 2. Effect ofcuring temperature on total soluble solids (°Brix) at room temperature storage

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RESEARCH ARTICLE

Assessment of Potable Water Quality of Tribal and Non -Tribal Areas of Kodai Hills, Tamil Nadu, India.

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ABSTRACT

The sustainable development of human life, agriculture, and industries depends on the availability / accessibility of clean water, a finite resource.The major sources of water contamination in the hills are due to the domestic waste water and agriculture run off that is being carried off by running waters. The contaminated water carries various diseases causing pathogenic microorganism.The drinking water quality was checked including E-coli contaminant. The drinking water samples were collected during September to December 2013, from both the tribal and non tribal residing areas. The sources of the samples collection are bore well, stream, river, pool, spring and municipality water supply.Various physico – chemical and microbial analysis were conducted according to standard analytical procedure. The results showed higher level of fluoride (1.6mg/L), Nitrate (46mg/L) and higher level of bacterial colonies were observed and also MPN test showed (2-17mg/l). This result showed that the natural water resources in the Kodai hill is getting polluted and is unfit for consumption and could cause adverse health hazards. Hence, environmental awareness programme was conducted in tribal areas of Kodaikanal to protect the people health.

Keywords: Physico- Chemical, E- coli MPN, Pollutants, Health hazards, Nitrate, Kodaikanal.

INTRODUCTION

Water the most precious natural finite resources on the earth is essential for the existence of life, domestic, industrial and commercial uses of the available three quarters of the earth water just 2.8% is utilized for human consumption [15].Unprotected and poor water resources management depletes the quality of natural ground water [26]. Ancient people harvested rainwater and stored them in different containers and used it in dry reasons [35]. Access to ground water from springs and wells increased due to surface water demand. Soil functions as a barrier for the movement of pollutants into the underground water table, which is the dependable source for water [18]. Assessment and classification of water based on physical and chemical parameters plays a major role in determining the water quality. Better knowledge of water quality is essential as its usage extends to agriculture domestics and industrial functioning [27]. Hydrocarbons, metals, cyanide, arsenic, different synthetic substances, soluble form of nitrogen, phosphorous and organic matter are the possible water pollutants. Treatment of ground water with chemical causes intoxication of water [29, 28, 3].

Ground water the major sources of drinking water, if contaminate affects the public health and in common small communities of developing nation [6].The chemical contaminants in water pollute the nature of water quality and causes chronic effects in living beings as time passes. Careless and improperly treated water contains microbial pollutants which are the agents of several diseases in human beings such as cholera, typhoid, hepatitis, and giardiasis [26, 6, 8, 11, 12]. Along with the microbial and chemical contaminants polluting the water resources various anthropogenic activities like land discharge of sewage effluent, solid and sludge waste, urban runoff, agricultural practices, industrial discharge pollute the water in large quantity [1, 4, 6, 8, 11,12, 17,24, 21,29]. Potability of water is determined based on physico-chemical and microbial assessment since the human health depends on water quality. So the analysis prior to consumption is regarded for any source of available water [34]. Access and availability of good quality of water is affected due to improper handling and management in treatment techniques [32]. Almost 70% of natural water resource pollution in India is due to the release of industrial effluent and domestic sewage into them without proper treatment [30].

Water becomes unfit for consumption in the presence of objectionable task, odor and color. Hence, to obtain the potable quality it must be treated properly [19]. Natural water fecally contaminated contains E.coli in them, which produce health hazards to human society if consume [37]. Sellaite(MgF2), Fluorspar (CaF2), Cryolite (a3 ALF6) and Fluorappatite [(3Ca3(Po4)2 Ca(F,Cl)2] comprises fluoride in nature. Sedimentary rocks and igneous rocks are the source of fluorescence and cryolite respectively. The mineral fluoride remains stable in water. Industries discharging fluoride containing effluent gets dissolved in ground water due to their higher concentration. Formation of teeth and force requires a little amount of fluoride with a basic mineral constituent which displace hydroxide ions from hydroxyapatite. Long term exposure to higher fluoride concentration leads to dental flurosis which later leads to skeletal flurosis [10]. Drinking water with 0.7 mg/L of fluoride is considered as beneficiary, and level exceeding 1.5 mg/L is harmful and followed by most of the nation and the limit described by World Health Organization [36, 31, 23]. Fluoride is considered as an essential mineral when in required quantity. Whereas the comparison of low dose or high dose of fluoride is not defined clearly [38]. Nitrates in nature occur due to rainfall or ground water aquifer up to some extends in the form of nitrate – nitrogen. Regular application of inorganic fertilizer and animal manure for crop cultivation leaches into the water table underground and causes contamination of the water used by the rural communities. Consumption of nitrate polluted water leads to methemoglobinemia “Blue baby syndrome”. New born infant up to 4 month old gets affected due to chemical changes of nitrate to nitrate in the infant’s stomach. Due to nitrate contamination in human body instead of RBC binding with oxygen molecule, this is binding with nitrate cause methemoglobin. Certain adult and young children also get affected due to nitrate in drinking water. Nitrate is also an indicator of other determination of potable water quality is essential before consumption. [31]

MATERIALS AND METHODS

Sampling Location and Source of the samples

Kodaikanal is one of the hot tourist spots of Tamil Nadu is located at the Western Ghats. The population residing here depends mostly on the natural water resources such as river, rainfall, streams, springs, pool and water provided by municipality. Due to the demand in surface water availability, the people here have switched to underground water too. The main source of income for the people here is agriculture. The agricultural practicing is also run with the available water resource. Hence, an attempt was made to gain knowledge about the quality of the potable water from all the above mentioned sources, during Aug- 2013-Jan.2014.

Nearly, 52 sampling locations were selected for the sample collection. The sampling sites included both the tribal and non-tribal populations (Table 1). The samples were collected in sterilized polythene bottles, protected from light and transported to the laboratory safety.

Physico-Chemical Characterization

The Physico-Chemical Characterization comprised the analysis of EC, pH, Acidity, Alkalinity, Calcium, Magnesium, Hardness, Chloride, Fluoride, Nitrate, Sulphate, Phosphate, Total Dissolved and suspended Solids, were determined according to standard analytical method [2].

Microbial analysis

Microbial analysis of the drinking water were done for total and fecal coliform and measured by standard plot count using standard nutrient agar. The microbial analysis was studied with 24 hours of collections standard methods for the determination of total coliform and fecal coliform were done [7, 2]. The analysis was done in triplicate.

Awareness creation

After the careful assessment of water quality, the sampling sites especially tribal areas were needed the awareness regarding environmental protection, water quality, water borne diseases, organic farming etc. The environmental awareness programme was conducted on 14.3.2014 and 12.9.2014 in Combai-Perunkadu tribal area and Alathurai areas.

RESULTS AND DISCUSSION

The obtained values of water parameters were compared with BIS standard. All the values are within permissible limit except nitrate and fluoride.The result of the physico- chemical characterization of the entire 52 sample is presented in Table 2. The range of pH for all the samples were from 6.07- 7.57. The range of pH for drinking water and domestic purpose should be 6.5- 8.9 [37]. The pH value for ground water samples of Guntur district was found to be in the range of 6.6-7.9 [33]. Also the pH is an index for acidity and alkalinity.EC indicates the direct function of total dissolved salts in the water [13]. The permissible limit for EC given by WHO for water is 300 mmhos/cm.The value of EC for the samples ranged from 0.102- 102mScm^{-1}. The EC values of hand dug well in Ghana was 46 to 282 ms/cm [20]. The amount of total dissolved solids decides the water quality. The TDS of the water samples ranged from 0-200mg/L. Based on the physical parameters, all the water samples are fit for consumption. The most prevalent anion in water is chloride. The values of acidity, alkalinity, hardness, potassium, calcium, magnesium, suphate and phosphate were found to be within permissible limits. Similar such value has been reported by sudhakar gummadi *et al* 2014 [33].

The levels of acidity in the samples were 12.5-50mg/L. Normal acidity in samples is due to inorganic organic acidifying precursors including SO_x and NO_x and organic waste decomposing into organic acids and acidic precipitation [24]. Acidic precipitation results inhibition of microbial decomposition, nitrogen fixation and increase in solubility and mobility of toxic heavy metals with the environment [21]. Alkalinity 70-230 mg/L level was observed in the samples. The levels of phosphate in the samples were 0.3-1.7mg/L and sulphate was 45-200/mg/LThe permissible limit of chloride according to WHO and BIS in drinking water is 250 mg/L [16]. The values of chloride in the samples were 39-220mg/L. The concentration of calcium was 45-250mg/L.The calcium concentration also corresponds to total hardness. The limit for the amount of calcium in the drinking water as per BIS limit is 75mg/L. According to Haruna *et al* (2005) [14], the detection of nitrate and chloride in spring water is associated with faecal contamination.

The greater amount of phosphate and various other nutrient components in water is due to human activities, routine habit of applying agricultural fertilizers and domestic detergents. Nearly 52 -70 % of phosphate existing as orthophosphate, in the form of phosphoric acid, dihydrogen phosphate and phosphate irons indicates phosphate contamination resulting in eutrophication.Nitrate leaching from the agricultural surface near to water resources cause water contamination. The permissible limit of nitrate in drinking water is 45mg/L according to BIS. The value of nitrate was beyond the permissible limit in municipality water, Thanthimedu, Naidupuram, Pakkiapuram, Pallangi, Perumal malai, Kadukuthadi, Anjuveedu, Pethuparai and combai (Alathurai). Among the 10 samples, Anjuveedu and Combai have higher amount of nitrate.The higher nitrate contamination was attributed by the open defecation in water sources, chemical fertilizers, farm waste, mixing of sewage, dumping of solid waste near river bank etc., The higher amount of nitrate from drinking water must be removed or cause blue baby syndrome.[36]Phosphate fertilizer from agricultural field and run off along with domestic wastes increases the concentration of fluoride [5]. The standard permissible limit for fluoride is 1.0-1.5 mg/L.

The levels of fluoride in the samples were found to be 1.6 – 1.8 mg/L. The sample station such as Naidupuram, Pakiapuram, Pallangi, Alathurai, perumal malai, exceeds the fluoride level, the reason may be the most frequently ground water contain higher level of fluoride, due to the nature of the rocks that carry or transport of fluoride containing minerals in rain water. In general fluoride with high concentration is due to calcium poor aquifer where the exchange of cation with sodium for calcium taken place. Fluoride contamination may causes fluorosis. Hence, based on the nitrate and fluoride content, the above mentioned samples were not suitable for drinking. The nitrate and fluoride removal technique must be adapted before going to drinking of these samples. The pollution activities must be prevented near water sources of Kodaikanal hills.

Microbial Analysis

The amount of faecal coliform counts/100ml of samples should be zero for drinking water with respect to health aspect. Increased level of CO_2 may be season for low pH values which affect the bacterial amount. Total coliform in water indicates the faecal contamination.Entire sample is contaminated with e.coli (Table 3) and unfit for consumption. The substances leaching from the waste matter enter into the ground water [9].The higher level of bacterial contaminants may be due to the absence of drainage system and discharging the domestic waste in to the running stream and open defecation near water sources. Domestic and wild animals which consume the water also pollute the water by direct defecation and urination.

CONCLUSION

The examination of physico-chemical and biological quality of all the water samples from the tribal and non-tribal areas of Kodaikanal hill represented the presence of contamination sources, nitrate, fluoride and faecal contaminants were high in concentration due to emergence of pollutants from various avoidable and unavoidable sources like application of chemical fertilizers and animal manure for crop cultivation, defecation in open sources and soil

erosion. The results makes it clear that the need for water treatment is essential, before being for consumption and to protect the health of tribal and non-tribal people of Kodaikanal hills.

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Table 1: Sample locations of Kodaikanal hills

S.No.	Sampling sites	Sampling source
1.	Municipality	Bund
2.	Thanthimedu	Stream
3.	Ghanthipuram	Stream
4.	Keelpoomi	Bore
5.	Naidupuram	Pool
6.	Pakiapuram	Pool
7.	Pallangi	River
8.	Attuvampatti	Bore
9.	Villpatti	River
10.	Odagalparai	River
11.	Perungadu	Pool
12.	Alathurai	River
13.	M.M. Street	Well
14.	Pragasapuram	Stream
15.	Cityview	Stream
16.	Senbaganoor	Stream
17.	Perumalmalai	Falls
18.	Adukkam	Pool
19.	Pannaikadu	Bore
20.	Kaduguthadi	Falls
21.	Thandikudi	Tap
22.	Mangalapuram	Pool
23.	Kanalkadu	Stream
24.	Patlangadu	Stream
25.	K.C. Patti	Well
26.	Kuppama Patti	River
27.	Anjuveedu	River
28.	Paethuparai	River
29.	Vadakavunji	Pool
30.	Pachalur	Well
31.	Periyoor	Well
32.	Poolathur	Pool
33.	Kumbarayoor	Pool
34.	OOthu	River
35.	Machur	River
36.	Valagiri	Stream
37.	Vadakaraiparai	Stream
38.	Poomparai.	Bore
39.	Poombarai.	Well
40.	Mannavanur	River
41.	Colony	Stream
42.	Kaikatti	River
43.	Poondi	Stream
44.	Kavunji	Stream
45.	Polur	River
46.	Klavarai	Falls
47.	Kookal	Lake
48.	Gundpatti.A colony	Well
49.	Gundpatti.Bcolony	Well
50.	Gundpatti.C colony	Well
51.	PzhamPuthur	Pool
52.	Kumburvayal	Pond

Table 2 : physical characterization of potable water in Kodaikanal for the month of Aug 2013-Sep 2014.

Sample Code	pH		EC		TS		TDS		TSS	
	Dec	Jan	Dec	Jan	Dec	Jan	Dec	Jan	Dec	Jan
S1	6.97	6.98	0.102	0.204	300	400	200	200	100	200
S2	6.42	6.53	0.306	0.306	400	400	200	300	200	100
S3	6.51	6.59	0.408	0.306	100	300	100	200	0	100
S4	6.38	6.43	0.204	0.204	200	300	100	200	100	100
S5	6.83	7.97	0.306	0.408	100	200	0	100	100	100
S6	7.27	7.21	0.306	0.306	100	300	100	200	0	100
S7	6.94	7.21	0.204	0.408	100	400	100	200	0	200
S8	6.89	6.93	0.102	0.204	400	300	100	200	100	100
S9	6.63	6.76	0.204	0.306	300	200	200	200	0	100
S10	7.32	7.45	0.204	0.204	200	400	100	200	100	100
S11	6.84	6.90	0.204	0.306	300	300	200	200	100	100
S12	6.98	7.09	0.204	0.102	500	400	300	300	200	100
S13	7.27	7.31	0.306	0.204	100	300	200	200	200	100
S14	7.30	7.32	0.102	0.204	200	300	200	100	100	200
S15	6.45	6.23	0.204	0.408	400	300	200	200	200	100
S16	6.26	6.54	0.204	0.204	300	200	100	200	100	100
S17	6.58	6.62	0.204	0.408	500	300	200	200	200	100
S18	6.56	6.70	0.204	0.306	300	400	200	300	100	100
S19	6.89	6.92	0.306	0.306	300	300	200	200	100	100
S20	7.45	7.57	0.204	0.306	100	200	200	100	100	100
S21	7.03	7.24	0.204	0.306	200	400	100	300	100	100
S22	6.23	6.38	0.306	0.204	100	300	100	200	100	100
S23	6.95	6.98	0.408	0.408	100	200	100	100	200	100
S24	7.02	7.26	0.306	0.204	300	300	200	200	100	100
S25	6.34	6.47	0.204	0.306	100	500	100	300	100	200
S26	6.19	6.26	0.102	0.204	200	400	200	300	100	100
S27	6.85	6.87	0.306	0.306	200	400	0	300	100	100
S28	6.92	6.95	0.204	0.204	300	300	200	100	100	200
S29	6.71	6.76	0.102	0.204	400	200	100	200	100	0
S30	6.54	6.59	0.204	0.306	300	200	200	200	100	0
S31	6.63	6.89	0.204	0.306	400	200	200	100	200	100
S32	6.20	6.56	0.306	0.306	300	200	0	100	100	100
S33	6.23	6.43	0.102	0.102	200	300	200	100	100	200
S34	7.10	6.87	0.204	0.204	400	100	200	100	200	0
S35	6.93	6.67	0.306	0.408	500	200	300	100	200	100
S36	6.41	6.56	0.204	0.306	300	300	200	100	100	200
S37	6.38	6.44	0.306	0.306	300	400	200	300	0	100
S38	7.65	7.58	0.204	0.102	200	200	100	100	100	100
S39	7.27	6.31	0.306	0.204	400	300	200	200	200	100
S40	6.90	6.96	0.102	0.204	400	200	100	100	200	100
S41	7.56	7.47	0.204	0.204	200	300	100	200	100	100
S42	6.68	6.74	0.102	0.102	100	200	0	200	100	100
S43	6.80	6.94	0.204	0.306	300	200	200	100	100	100
S44	6.53	6.65	0.102	0.204	200	100	100	100	100	0
S45	6.38	6.41	0.204	0.306	400	300	300	200	100	100
S46	6.56	7.67	0.204	0.408	200	400	200	200	100	200
S47	6.72	6.80	0.306	0.306	300	300	200	200	200	100
S48	6.97	6.93	0.306	0.306	400	400	200	200	200	200
S49	6.48	6.54	0.204	0.204	300	200	100	100	200	100
S50	6.69	6.78	0.102	0.204	300	300	200	200	100	100
S51	7.02	7.04	0.204	0.306	400	400	200	200	200	200
S52	7.06	7.13	0.204	0.204	500	300	300	200	200	100

Table 3 .Total Coliform bacterial test

S.No.	Sampling sites	Microbial respiration	E-coli count
1.	Municipality	3,3,1	14
2.	Thanthimedu	2,2,1	9
3.	Ghanthipuram	1,1,1	6
4.	Keelpoomi	1,0,1	4
5.	Naidupuram	3,2,1	17
6.	Pakiapuram	3,3,1	14
7.	Pallangi	2,1,0	7
8.	Attuvampatti	2,1,1	9
9.	Villpatti	1,1,1	6
10.	Odagalparai	1,1,1	6
11.	Perungadu	2,1,1	9
12.	Alathurai	1,0,1	4
13.	M.M. Street	1,1,1	6
14.	Pragasapuram	2,1,1	9
15.	Cityview	1,0,1	6
16.	Senbaganoor	1,0,0	2
17.	Perumalmalai	3,2,1	17
18.	Adukkam	1,0,1	4
19.	Pannaikadu	1,0,0	2
20.	Kaduguthadi	1,0,0	2
21.	Thandikudi	1,0,1	4
22.	Mangalapuram	1,0,0	2
23.	Kanalkadu	1,0,1	4
24.	Patlangadu	1,0,0	2
25.	K.C. Patti	1,0,1	4
26.	Kuppama Patti	1,0,0	2
27.	Anjuveedu	1,0,1	4
28.	Paethuparai	1,1,1	6
29.	Vadakavunji	1,1,1	6
30.	Pachalur	2,1,1	9
31.	Periyoor	1,0,1	4
32.	Poolathur	1,1,1	6
33.	Kumbarayoor	2,1,1	9
34.	OOthu	1,0,1	6
35.	Machur	1,0,0	2
36.	Valagiri	1,1,1	6
37.	Vadakaraiparai	1,1,1	6
38.	Poomparai. Bore water	2,1,1	9
39.	Poombarai. Well Water	1,0,1	4
40.	Mannavanur	1,0,0	2
41.	Colony	1,0,1	4
42.	Kaikatti	1,1,1	6
43.	Poondi	1,1,1	6
44.	Kavunji	1,0,1	4
45.	Polur	1,0,0	2
46.	Klavarai	1,0,1	4
47.	Kookal	2,1,1	9
48.	Gundpatti.A colony	1,1,1	6
49.	Gundpatti.Bcolony	1,1,1	6
50.	Gundpatti.C colony	2,1,1	9
51.	PzhamPuthur	1,0,1	4
52.	Kumburvayal	2,1,1	9

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RESEARCH ARTICLE

The Effect of Designing Agility Model of Organization and the Relationship between Equality and Job Satisfaction among Organization Staffs.

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ABSTRACT

Today, most of the organizations and companies are encountered with high competition and uncertain environment and this is exacerbated by technology innovations and the customers changing needs. The past approaches in supply chain are not capable in these environments. One of the solutions to cope up with such challenges is agility. High education centers namely Universities as the most important scientific and research resources have major role in development of any society. Achieving high education goals including university depends upon optimal use of human resources, financial resources and equipment. The present study aimed to investigate the relationship between equality feeling and job satisfaction of the staffs of high education organizations and a research was conducted in Ferdoosi University of Mashhad. The study population is administrative staffs of central organization of Ferdoosi University of Mashhad and the sample size was obtained by Morgan formula as n=266. The study is correlation design. Three questions Including: equality evaluation, job satisfaction evaluation and the information of employees of reward of others" were used for data collection. The data were analyzed by Pearson correlation test and t-test.

Key words: Equality, Job satisfaction, Organizational justice, Job conscience.

INTRODUCTION

Agile supply chain not only reacts to common changes, but also they react well to dramatic changes of market felt for the first time. It seems that agility is the required property for competitive future pressures of organizations and achieving competitive advantage. Employees' motivation is affected by relative and absolute rewards. "Equality theory takes our attention to fair reward system. People are motivated based on comparing themselves with co-workers and fair rewards will be necessary in this regard."Job satisfaction indicates consistency of these new expectations of human being with the rewards provided by working.In the study, equality of reward and job satisfaction of staffs of central organization of staffs of central organization of Ferdousi University of Mashhad is considered. By evaluation of equality feeling or organization attempt to pay fair reward of staffs, we can be aware of their job satisfaction and by appropriate use this theory achieve productive work and satisfaction (Yusef et al., 1999).

Various definitions of agility are presented. Christopher defined agility as the ability of an organization in rapid reaction to the changes of demand in terms of volume and variety (Yusef et al., 1999).But Tolon believed that agility "indicates effective integration of supply chain and emphasizes on very close and long-term relations with consumers and suppliers". Despite many definitions of agility, none of them are contradictory. These definitions show the idea of "speed and change in business environment". Based on new discussion of ability, there is no comprehensive definition agreed by all people (Nily, 1994).To achieve competitive advantage in business environment, the companies should be adapted with the suppliers and customers along their operation efficiency and collaborate with each other to achieve acceptable level of agility (Davis and Newstorm, 1996). Thus, agile supply chain is formed in such condition. An agile supply chain can respond the changes in work place appropriately (Hersey and Blanchard, 1996). Agility in supply chain is defined as followings:

"Capability of a supply chain for rapid response to existing changes in market and customers' needs"Various researches are conducted on agility of agile supply chain and an aspect of agility is selected in most of the studies (Nily, 1994).

Victor and Room defined job satisfaction as emotional inclinations of people to their job roles. Hoy and Miskel(1982) cited from Patricia and Smith (1967) as: Job satisfaction means mental improvement of meeting the needs, inclinations and hopes of a person of his work. Chester and Bernard (1985) believed that job satisfaction causes continuity of a person collaboration and organization. Based on the above definitions, it can be said equality is a comparison a person has in his work place. If the ratio of a person input to organization "including materialistic and spiritual" to the outputs with other similar co-workers are equal in organization, this person feels equality. Equality theory had three messages for managers. First, each of the organization members should know its payment basis. Second, people consider their rewards form some views, some consider its tangible view, others intangible aspect. Third, people act based on their perception of reality. To consider organization rewards fair, the employee should consider brief balance between his perceptions of value for organization and his real position in rewards structure.

Interpretive-structural modeling (ISM)

Interpretive-structural modeling (ISM) was raised by Warfield (1976) and it is a methodology to create and understand the relations between the elements of a complex system. In other words, ISM is an interactive process in which a set of various elements are structure with each other in a comprehensive systematic. ISM methodology helps much in establishing order in complex relations among the elements of a system (Huang et al., 2005).ISM helps in determination of internal relations of variables and it is a technique for analysis of a variable on other variables. Also, ISM can prioritize and determine the elements of a system and this helps the managers for better implementation of the model. ISM is used in various researches and some of the researches are shown in Table 2.

For ISM technique, internal relations and priorities of elements in a system should be considered. The applied variables in ISM are determined based on identification of variables of the issue (Huang et al., 2005).

Obtaining structural self-interaction matrix (SSIM)

After identification of variables, we enter these variables in SSIM. This matrix is based on dimensions of variables mentioned in the first row and column of the variables. Then, relations are denoted by some symbols as paired. These symbols include:

V: Row factor (i) can prepare to achieve column factor (j).
A: Row factor (j) can prepare to achieve column factor (i).
X: there is mutual relation between row factor (i) and column (j). Both of them can make them achieve each other.
O: There is no relationship between these two elements (ij).
Obtaining reachability matrix
By turning SSIM matrix relations to 0 and 1, we can achieve matrix.
Adaptability of reachability matrix
After obtaining initial reachability matrix, its internal consistency should be established. For consistency of matrix, various methods are proposed and two general methods are considered:

- First method: If inconsistency was obtained in reachability matrix, the questionnaire should be filled again by experts and then consistency of reachability matrix is checked and this should be continued to establish consistency.
- Second method: Math rules are used in this method to create consistency in reachability matrix. As reachability matrix can be increased to (K+1) and $K \geq 1$.

Determining the level and priority of variables

To determine level and priority of variables, reachability set and pre-requirement sets are determined for each variable. Reachability set of each variable includes the variables by which we can achieve them and pre-requirement set is including the variables by which we can reach these variables. This is done by reachability matrix. After determining reachability set and pre-requirement for each variables, common elements in reachability and pre-requirement matrix are identified.
After determining pre-requirement and achieving common elements, we can determine variables level (elements).

Drawing model

After determining relations and variables, we can draw a model. TO do this, at first variables are based on their level as top to bottom. The variables are in 6 levels in the present study (Figure 1).

MICMAC analysis

In MICMAC analysis, variables are divided based on driver power and dependence into four groups. Firs group includes “independent variables” with weak driver power and dependence. These variables are not connected to system and have low and weak communication with system (Huang et al., 2005). None of the variables are in this group in the present study and this indicates strong relationship of the variables with each other in agility model. “Dependent variables” are second type with low driver power and high dependence. Product quality variables (11), customer satisfaction (10), introducing new product (7), reduction of costs (9) are in this group. These variables are agile results for which various factors are involved and they less prepare other variables.

Customer satisfaction (10) is important. The third type is "connecting variables" with high driver power and high dependence. These variables are non-stationary and any change of them can affect the system and feedback of system can change these variables. Integration of processes variable (3), sensitivity and responsiveness (4), flexibility (6) and delivery speed (8) are in this group. Fourth group includes "independent variables" with strong driver power and weak dependence. This group is the basis of the model and at first we should emphasize on them. The development of staffs' skills (1), good planning (5) and using IT are in this group. Development of staffs' skills is one of the most important variables and we should emphasize on it to make the chain agile.

METHODOLOGY

Aim of the study is correlation design. The study population is all the administrative employees "non-faculty members" except managers and supervisors of center organization of Ferdoosi University of Mashhad in 1998 and employed staffs in this organization are N=808.

Sample population

As the studied population can be listed, the best sampling method is the relationship between equality and job satisfaction in staffs of high education centers. The sampling was simple method.Sample size by Morgan Table was N=266.

Study measure

The data collection measure was questionnaire. Three questionnaires of job satisfaction, equality and information were used. Each of the questions had four scales for measuring and with close choices as:

a. Equality in reward questionnaire

This questionnaire consists of 26 items and equality of employees was measured in five separate groups compared to 5 reference groups, co-workers, staffs of other university units, staffs of other state offices, the person and are measured compared to the supervisors.

b. Job satisfaction questionnaire

To measure evaluation of job satisfaction of the staffs, short-question questionnaire of job satisfaction of Briefled and Routh (1915) was used. This questionnaire is consisting of 19 questions.

c. A researcher-built questionnaire was used for the awareness of subjects of the reward of others. This question measured the awareness of subjects of the reward of co-workers, supervisors, staffs of other units and the staffs of other state offices. Scoring based on Likert scale was used in this questionnaire.

Data analysis method

To obtain the required data, 280 questionnaires were distributed among administrative staffs of central organization of Ferdoosi University of Mashhad and after completion of questionnaires by employees and collecting and eliminating incomplete questionnaires, the data of 266 questionnaires were achieved. Descriptive and inference statistics were used for classification, summarization, description and analysis of the questionnaires of the data collected to respond the study questions. All the calculations were made by SPSS software. Some of the hypotheses and data analysis methods are presented.

Main hypothesis

There is a positively significant association between equality feeling of the staffs of central organization of Ferdoosi University of Mashhad and their job satisfaction.

Subhypothesis

There is a positively significant association between awareness of employees to others reward and their equality feeling.Both hypotheses were analyzed using Pearson moment correlation coefficient. It also required continuality of both variables and t-test was used for significance.

The description of Tables and the results of each of study hypotheses
The findings of equality and job satisfaction

Based on Table 1, of 266 responses of equality, the highest mean is dedicated to equality of employees compared to the same unit co-workers is "item 1". As mean 14.39 is dedicated to homogenous environment or subject and created the highest feeling in a person. The second equality feeling in subject with mean 13.86 is about other academic units "item 2" with second rank of homogeneity with employees. The third equality feeling with mean 11.31 compared to supervisors is item 5. Equality is about comparison with other state offices "item 3" with the least homogeneity with mean 10.54 is in the fourth priority. Equality feeling is arising from the comparison of subject with himself and it had the lowest role in the sum of equality.

RESULTS AND DISCUSSION

There is a positively significant association between equality of administrative staffs of central organization of Ferdoosi University of Mashhad and their job satisfaction.The applied statistical model is Pearson moment correlation test and T-test.As shown in the following Table, there is an association of 0.434 between these two variables and this is significant with probability 0.999.

Based on the above tables:

- The correlation between equality compared to co-workers "item 1 of equality" and job satisfaction with probability 0.999 is significant.
- The correlation between equality compared to other academic units "item 2 of equality" and job satisfaction with probability 0.999 was significant.
- The correlation between equality compared to other state offices "item 3 of equality" and job satisfaction with probability 0.999 was significant.
- The correlation between equality compared to previous condition of self "item 4 of equality" and job satisfaction with probability 0.999 was significant.
- The correlation between equality compared to supervisors "item 5 of equality" and job satisfaction with probability 0.999 was significant.

There is a positively significant association between awareness of employees to reward of others and their equality. The applied study model is Pearson moment correlation test and T-test. As shown in the table, there is relationship of 0.147 between two variables of awareness of others reward and equality feeling and this is significant with probability 95%.
People measurements are based on their perception of reality. Table 1 showed equality feeling of employees compared to other offices as 10.54 and this difference is in reward system of other offices compared to university and this indicates that not only jobs classification was not successful in eliminating this injustice between payment of

reward in various jobs, but also despite equal system law of payment since 1996, there was great difference between the ministries with exchange income and those without this income. They mostly know government responsible for their financial issues as education department and university to pay the various rewards including housing loan and other types of loans. Thus, the employees feel less equal in terms of rewarding system compared to other offices. The values with mean 10.54 are shown in Table 1.The equal ratio of these inputs to their outputs and other compared items are important and if this balance exists, the employee will be satisfied of the existing condition. But if one is paid less and another one as high, he feels unequal. The score of equality of employee compared to the reward in another organization is reduced in this study. As the reward in other offices has better quality and quantity and the employee considers his wage less than other offices and he feels inequality. "If people receive more wage, they react indirectly".The results of awareness of others reward and equality feeling.Table 5 indicated that mean score of awareness of reward of other employees is 9.21 and equality feeling mean score of reward is 60.Table 6 indicates the minimum and maximum achieve score and minimum possible score about awareness of others reward and mean score is 9.21 and this shows that employees are not aware of the amount of others reward.

There is a positively significant association between equality feeling of administrative staffs of central organization of Ferdoosi University of Mashhad and their job satisfaction.Based on Table 7, study results showed that relationship as 0.434 is between two variables as equality of employees and their job satisfaction and this is significant with probability 0.999.Discrimination and its relationship with job satisfaction of the employees is one of the important issues of organization namely University as a cultural environment and it has adverse effect on quality of performance of staffs. As shown in Table 1, regarding the opinion of employees regarding the negligence in student deputy, 75% of employees considered discrimination as the reason of negligence and 71% of authorities confessed about the discrimination in administrative units of University.
As shown in Table 8, there is an association between job satisfaction and five reference groups regarding equality:

- The relationship between equality compared to co-workers and job satisfaction is 0.296.
- Relationship between equality feeling compared to other units and job satisfaction as 0.406 and it is more than relationship in comparison to co-workers.
- Relationship of equality feeling compared to other state offices and job satisfaction is 0.338.
- The relationship between equality compared to him and job satisfaction is as 0.331.
- Relationship between equality feelings compared to supervisors and job satisfaction as 0.294.

As shown, this association or relationship about co-workers both in the same unit is equal.

There is a positively significant association between awareness of employees to reward of others and their equality.
Table 9 indicates the correlation of awareness to others reward and equality feeling is 0.147.It can be said if the employee is be aware of the reward payment to other employees, as the information can be the basis of the comparison of the inputs and outputs and others, more equality feeling is created."Equality theory has three messages for managers: First each of the organization members should know the basis of reward payment. For example, if more reward is dedicated to work quality, the employees should be aware clearly".As shown in Table 6, the mean awareness of reward of others was 9.21 and maximum score is 16. As shown in Table 3, the mean awareness of formal employees is 9.46 and it is reduced to 8.56 score among company employees. This means low awareness of employees of the performance of reward system namely regarding company employees. Based on Tables 1, 2, it can be said the mean equality feeling and job satisfaction was low among company employees compared to other employees and this defined the relationship between awareness and equality feeling.
Job satisfaction is general tendency of a person to his job. Based on the results of the study, it can be said, a person with high job satisfaction has positive inclination to job but the one with dissatisfaction has negative inclination to his work. Observing justice and equality in job satisfaction of employees is of great importance.
The present study evaluated the relationship between equality feelings in reward with job satisfaction of employees. The results of the study are as:

- There is a correlation between equality feeling in reward of employees compared to co-workers and their job satisfaction.
- There is a correlation between equality feeling in reward of employees compared to other University units and their job satisfaction.
- There is a correlation between equality feeling in reward of employees compared to other state offices and their job satisfaction.
- There is a correlation between equality feeling in reward of employees compared to their previous condition and their job satisfaction.
- There is a correlation between equality feeling in reward of employees compared to supervisors and their job satisfaction.
- There is a correlation between awareness of others reward and equality feeling of employees.

Study limitations

As some of the distributed questionnaires were not returned, it is possible the lack of access to information was effective on the data of this study.

Study recommendations

Based on the study results, the following recommendations are presented:

1- Reward system should attempt to have discrete weighting and evaluation to achieve suitable reward in each job.
2- The organizations should attempt to give equal reward to employees to feel faire in comparison with others, in such conditions, it will have satisfied employees.
3- Payment coordinated system should be analyzed exactly and the payment of reward in different types of organizations should be corrected as the basis of classification of jobs has equal output as the employees data are equal in an organization position.
4- We should give importance to some organizations as education department and University as playing important role in society structure in order that all the employees play important role in this regard and they will have complete job satisfaction and they show highest attempt to achieve important goals of these two ministries.
5- They should inform employees of paying materialistic and spiritual rewards in organizations and give the necessary information to them in order than the employees are aware of the reasons of the difference in their outputs compared to others and don't imagine differences as discrimination and injustice in reward payment system.

The results of the study can be used by the managers in dynamic and complex environments and they should try to make supply chain or organization agile. Three points should be considered in the results. The first point is about the selected factors. Various researchers referred to various factors. Most of the researches considered the number of factors as limited or raised some factors in the study as separately with one title. This is due to the extension of the model. At first, the goal was to make a model including the first steps in agility, emphasis on human resources to the last results of agility, customer satisfaction.The second point is about the factors level in model. Factors are based on 6 levels. The levels obtained in ISM indicated the order and sequence of factors in terms of execution. The results showed that for agility, at first they should emphasize on 3 factors of development of skills of employees and using IT and good planning. The role of development of employees' skills is more than two other factors as this factor can prepare two other factors. The third point is about the relationship between the factors. By a general view, we can say most of the factors are interrelated with more effects and no extra factor is found. Any defect in a factor causes that the final result as customer result is problematic.

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Table 1- Descriptive display of subjects scores in five items Equality and job satisfaction

Statistical indices Equality feeling	Number of responses	Mean	SD
Equality compared to co-workers "item 1"	266	14.39	4.18
Equality compared to other units "item 2"	266	13.86	4.26
Equality compared to other state offices "item 3"	266	10.54	4.21
Equality compared to himself "item 4"	266	9.94	2.79
Equality compared to supervisors "item 5"	266	11.31	2.79
Job satisfaction	265	49.81	8.94

Table 2- Description of the sum of scores of equality in five items and job satisfaction of employees

Statistical indices Studied items	Number of responses	Mean	SD
Sum of equality feeling in reward	266	60	14.15
Job satisfaction	265	49.81	8.95

Table 3- Description of scores of equality of subjects

Subjects	Mean	SD	Minimum achieved score	Maximum achieved score	Minimum possible score	Maximum possible score
266	60	14.15	30	102	26	104

As shown in Table 3, minimum achieved score is 4 sores more than minimum score and maximum achieved score is 2 scores lower than maximum possible score.

Table 4- Description of the scores of job satisfaction of subjects

Subjects	Mean	SD	Minimum achieved score	Maximum achieved score	Minimum possible score	Maximum possible score
265	49.81	8.95	26	68	19	76

As shown in the above table, minimum achieve score is 7 scores more than minimum possible score and maximum achieve score as 8 scores less than maximum possible score.

Table 5- Description of subjects scores for awareness of rewards of other employees and equality feeling

Statistical indices / Studied items	Number of responses	Mean	SD
Awareness of others reward	266	9.21	2.70
Equality feeling to reward	266	60	14.15

The relationship between equality and job satisfaction of employees of high education centers

Table 6- Descriptive display of the scores of awareness of subjects of the rewards of others

Maximum possible score	Minimum possible score	Maximum achieved score	Minimum achieved score	SD	Mean	Subjects
16	4	16	4	2.70	9.21	266

As shown in the above table, the minimum and maximum achieve score and minimum and maximum possible score were consistent.

Table 7- Display of correlation matrix among all terms (components) of equality and job satisfaction

Equality	Job satisfaction	
0.4340 (265) p =0.000	1.000 (265) p = 0.	Job satisfaction
1.000 (266) p = 0.	0.4340 (266) p =0.000	Equality feeling

Table 8- Correlation matrix among the various items of equality and job satisfaction

	Equality compared to co-workers	Equality feeling compared to other units	Equality feeling compared to state offices	Equality feeling compared to himself	Equality compared to supervisors	Job satisfaction
Equality compared to co-workers	1.000 266 p =0.000	0.6966 266 p =0.000	0.4893 266 p =0.000	0.4754 266 p =0.000	0.2927 266 p =0.000	0.2968 265 p =0.000
Equality feeling compared to other units	0.6966 266 p =0.000	1.000 266 p =0.000	0.6621 266 p =0.000	0.5206 266 p =0.000	0.3955 266 p =0.000	0.4067 265 p =0.000

Equality feeling compared to state offices	0.4893 266 p =0.000	0.6621 266 p = 0.	1.000 266 p =0.000	0.4629 266 p =0.000	0.4082 266 p =0.000	0.3380 265 p =0.000
Equality feeling compared to himself	0.4754 266 p =0.000	0.5206 266 p =0.000	0.4629 266 p =0.000	1.000 266 p = 0.	0.3530 266 p =0.000	0.3318 265 p =0.000
Equality compared to supervisors	0.2927 266 p =0.000	0.3955 266 p =0.000	0.4082 266 p =0.000	0.3530 266 p =0.000	1.000 266 p =0.	0.2947 265 p = 0.000
Job satisfaction	0.2968 266 p =0.000	0.4067 266 p =0.000	0.3380 266 p =0.000	0.3318 266 p =0.000	0.2947 266 p =0.000	1.000 265 p = 0.

Table 9- Display of correlation matrix between item 6 “awareness of others reward” and equality feeling of staffs

	(awareness of others reward)	**Equality**
(Awareness of others reward)	1.000 (266) p = 0.	0.1470 (266) p =0.016
Equality feeling	0.1470 (266) p =0.016	1.000 (266) p = 0.

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RESEARCH ARTICLE

Solar Wind Ion Density Data Based Theories and Formulas to Predict the Earth Inner Core Motions, Inner Core Motion Based 4.0+ Magnitude Earthquakes Predictions and Review the Past Deadliest Earthquakes with Theories and Formulas

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ABSTRACT

Earthinner core motions create*spressure waves*in *Core* and that pressure waves creates mostly *4.0+ Magnitude Earthquakes*.The main objective of my research study is analysing the *Solar wind ion density* data using BATSRUS model of ACE satellite and use the ion density data into the Earth inner Core motion prediction formulas and compare formula resultswith USGS Earthquake details for conforming Earth Inner Core motion is occurred or not. Formula result contains predetermined time and magnitude of predicted Earthquake.This Research studyhelps to predict both Earthquake and Inner Core motions, and also helps to understand the core and Earthquakenatures and functions by usingmy theories.

Key words: Solar wind, Ion density,BATSRUS model, ACE satellite, motion, pressure wave, magma, formulas, theories,inner Core, EarthquakePrediction.

INTRODUCTION

In past century, scientists haven't been able to find obvious sign to predict the Earthquakes. But today we have many technologies to learn about *Earth* and that technology based learnings are enough to predict the Earthquakes. I created a basic theory to predict the Earthquake and I used some physics based formulas for conforming my theory to be right or wrong.Earth *Magnetosphere* act as a protecting field of Earth anddoes not allow Solar wind enter into a magnetic field, but charged particles and*ion*are enters into magnetosphere and increase day side *ionosphere* density level. So I take ion for my research of Solar wind based formulas and theories to predict the Earth inner Core

motions, and Inner core motion based 4.0+ Magnitude Earthquakes prediction. Eventually, I used ion density data of ACE satellite BATSRUS model data for my research. Overall my research will explain relationship between Solar wind, Earth Core, *Tectonic plates*, *Moon* andEarthquake.

Relationship between Solar Wind, Earth Inner Core and Earthquake

The solar wind consists of charged particles, mainly protons and electrons, emanating from the Sun in all directions.Solar wind charged particlesincreases Ion and Electric current in ionosphere. That electric current moves toward *magnetic Poles*and into Core and increase Electric current within Core.Sudden increasing solar wind is suddenly increases theelectric current circulation within and around the Core and suddenly increasethe inner core rotation speed or creates inner core motions and also sudden decreasing solar wind is suddenly decrease the electric current circulation within and around Core andsudden decrease the inner core rotationspeed or creates inner core motions.Coronal Mass Ejections [CME] and Solar flares are continually increasing the solar wind,Earth core electric current and the rotation speed of inner core.

Sudden increase/decreaseinner core rotation speed or sudden motionscreatespressure waves in Liquid outer Core. That pressure waves travel through *magma* and reaches the Earth crust.All Pressure waves are not reaching the crust,so mostly one or two,sometimes three Earthquakes occur in different places of world and thus Earthquakes occurs at few minute difference.For example,"While driving a bike, if sudden increase/decrease in the bike speed (electrons) is creates motion waves (p wave) which travel through the bike (outer core and magma) affects the bike's driver (crust) because changes in speed of wheels rotations (inner core) creates motion waves"

Relationship between Core and Tectonic Plates Movements

Earth'sInner Core motions continually creates pressuresin below the crust through magma. That magma pressure which is below the crust is forcingto move the tectonic plates. Mostly the Earthquakes occurs around the boundaries of tectonic plates because many volcanoes are near in boundaries of tectonic plates.Active Volcanoesare directly connects with liquid Outer Core through magma so pressure waves creates Earthquakes around the volcanic activity places. Continues Magma pressuresin below the crust is possible to move the tectonic plates and creates the new volcano, Island and mountains.

Relationsip between Moon and Magnitude of Earthquakes

Average distance between the Earth and the Moon is 384,400 km, At perigee (closest) is 363,104 km, At apogee (farthest) is 405,696 km, diameter of Earth (planet) is 12755km, diameter of Moon(satellite) is 3476.4km and diameter difference between Earth and Moon is 9278.6km.Less diameter differencesbetween Earth and Moon, and Moon elliptical Orbit aroundEarth are possible to increase the gravitational force between the Earth and Moon. That gravitational forces between Earth and Moon are possible to increase Core pressure and temperature level in both Earth and Moon.For example, Diameter of Jupiter (planet) is 142800km, diameter of Europa (satellite) is 3121.6km and diameter difference between Jupiter and Europa is 139678.4km. Gravitational force of Jupiter made heat on Europa core - Stephen Hawking`s life on Europa.

Diameter difference between the Earth and Moon is very low compared to Jupiter and Europa. So much possible toGravitational forcesvery higher between Earth and Moon, also that gravitational force is possible to increase temperature level in Earth Core.Gravitational force between Earth and Moon is possible to be highin Perigee Full moon so that gravitational forces is possible to increase temperature levelin Earth Core and magma, alsohelps to the pressure waves totravel faster and reach the crust and create high magnitude Earthquakes and also possible to increase the total number of Earthquakes per day.

For example, Magnitude 8.8 earthquake (27/02/2010 - 98% full moon) in Chile and magnitude 9.1 Sumatran earthquake (26/12/2004 - 99% full moon).

Possiblities of Marsquake

Solar wind is not possible to create inner core motions and major quakes in Mars because Mars do not have a strong magnetic field and liquid outer core. So, solar wind electric current is not possible to align toward magnetic poles and travel into Core. Now-a-days zero active volcano and no plate tectonic movement in mars because mars core dead and inner Core rotation to be equal with mars rotation.

Formulas and Rules for Earth Inner Core Motion Prediction and Inner Core Motion Based Earthquake Prediction

Formulas and rules:

Required values are**LIDD** = Lowest Ion Density data, **HIDD** = Highest Ion Density data, **FV** = Force Value, **F** = Force.

FV is predetermined concept by considering the Earth Core motion nature changes against electric current changes in core.

Neutral level: If HIDD $0 \leq 6$ then the use FV = 3

Moving level: If HIDD $7 \leq 11$ then the use FV = 2

Running level: If HIDD 12+ use the FV = 1.5

Calculation of Force:

F = LIDD × FV

Formula for Core Motion prediction:

$$CM = F \leq HIDD$$

Rule 1: Time difference between LIDD and HIDD must not be more than 15 minutes

Rule 2:LIDD or HIDD was at least 2 minutes to standby.

Rule 3:At least HIDD ≥ 6 must for Core Motion Calculations.

Rule 4: When the Core Motion prediction formula is TRUE than Magnitude 4.0+ Earthquake is possible to occur.

Rule 5: Mostly if FV = 3 or 2 than ifCM formula becomesto be TRUE then after within 30 minutes Magnitude 4.0+ Earthquakes are possible to occur.if FV = 1.5 than ifCM formula becomes to be TRUE then after within 40 minutes Magnitude 4.0+ Earthquakes are possible to occur. Above Earthquake occurring time limits created by considering the travel speed of pressure waves in while different speed of inner core motion occur.

Calculating the Core motion and predicting the Earthquake

A. Values for calculating the CM: (Using fig.3)

LIDD = 4, HIDD with Rule 2 = 13, FV = 1.5, F = 4 × 1.5 = 6, LIDD occurred time = 10:07:00, HIDD with Rule 2 occurred time = 10:12:00

$CM - 8 \leq 13$. CM formula is TRUE and FV = 1.5 sowithin 40 minutes(10:12:00 UTC to 10:52:00 UTC)M4.0+ Earthquake ispossible to occur.

M4.0+Earthquake Details:

1. 4.2 31km SE of Blenheim, New Zealand 2013-07-25 09:48:07 UTC 14.4 km
2. 4.0 67km SSW of Acajutla, El Salvador 2013-07-25 10:28:51 UTC 31.5 km
3. 4.5 40km WSW of Kandrian, Papua New Guinea 2013-07-25 10:42:43 UTC 55.4 km

B. Values for calculating the CM:

LIDD with Rule 2 = 5, HIDD = 16, FV = 1.5, F = 5 × 1.5 = 7.5, LIDD with Rule 2 occurred time = 10:20:00, HIDD occurred time = 10:15:00

$CM = 7.5 \leq 16$. CM formula is TRUE and FV = 1.5 so within 40 minutes (10:20:00 UTC to 11:00:00 UTC) M4.0+ Earthquake is possible to occur.

M4.0+Earthquake Details:

1. 4.5 40km WSW of Kandrian, Papua New Guinea 2013-07-25 10:42:43 UTC 55.4 km
2. 4.6 13km SE of Damulog, Philippines 2013-07-25 10:51:26 UTC 20.2 km

[Note: Ion density data are as per solar wind BATSRUS model – SWMF (Magnetosphere-Ionosphere) Real-time run: browse recent overview images in http://ccmc.gsfc.nasa.gov/cgi-bin/SWMF_RealTime_browse.cgi]

Review the M9.1 Earthquake in Sumatra and M8.8 Earthquake in Chile

Magnitude 8.8 Earthquake in Chile, Gross estimated the Chile quake should have shortened the length of day by about 1.26 microseconds and shifted Earth's figure axis by about 8 centimetres (3 inches). A similar calculation performed after the 2004 magnitude 9.1 Sumatran Earthquake revealed it should have shortened the length of day by 6.8 microseconds and shifted Earth's figure axis by about 7 centimetres, or 2.76 inches – **NASA**.Sudden increase Earth inner core rotation speedand motions creates changes in Earth mass,Earth figure axis and increase Earth rotation speed. Thus two Earthquakes are occurred in higher magnitude reason is more than 98% of full moon. Full moon increases the gravitational force between Earth and Moon and increases Earth Core and magma temperature level and helps to create highermagnitude of Earthquakes.

Review the Magnitude 5.9 Earthquake in Chabu, China

Values for calculating the CM:(Using fig.4)

LIDD = 2, HIDD with rule 2 = 6, FV = 3, F = 2 × 3 = 6, HIDD with Rule 2 occurred time = 23:35:00UT, LIDD occurred time = 23:25:00UT

$CM = 6 \leq 6$. CM formula is TRUE and FV = 3 so within 30 minutes (23:35:00 UTC, date 21/07/2013 to 00:05:00 UTC date 22/07/2013) M4.0+ Earthquake is possible to occur.

M4.0+Earthquake details

1. 4.6 43km SE of Blenheim, New Zealand 2013-07-21 22:47:23 UTC 4.3 km
2. 5.9 13km E of Chabu, China 2013-07-21 23:45:56 UTC 9.8 km
3. 4.7 46km WNW of Talcahuano, Chile 2013-07-22 00:02:43 UTC 11.6 km
4. 5.2 South Shetland Islands 2013-07-22 00:05:05 UTC 16.0 km
5. 4.7 14km SW of Xinsi Zhen, China 2013-07-22 00:09:43 UTC 9.4 km
6. 5.6 9km NNE of Chabu, China 2013-07-22 01:12:35 UTC 10.1 km

Review the 7.7 Magnitude Earthquakes in Awaran, Pakistan (Using fig.2)

Ion density in solar wind wasincreased at 08:30:00UT and continued to more than 12:30:00UT. That continues solar wind waspossible to increase the Electric current within Core and couldincrease the inner Core rotation speed.If any sudden changes in solar wind, that waspossible to create sudden inner Core motions and created4.0+magnitudeEarthquakes. An inner core motion was creating pressure in below the crust and possible to create a new island or volcano or new land.**Image 1: Here is the same area as in the photo above, on April 17, 2013. No island. NASA Earth Observatory image via Landsat 8 satellite. Image 2: Earthquake Island in PaddiZirr (West**

Bay) near Swadar, Pakistan. This island rose from the sea following the September 24, 2013 deadly earthquake in Pakistan. NASA Earth Observatory image via Earth-Observing-1 satellite (Fig.1&1a)

1) Values for calculating the CM: (Using fig.2)

LIDD with Rule 2 = 13, HIDD= 20, FV = 1.5, F = 13 × 1.5 = 19.5, LIDD with Rule 2 occurred time = 10:57:00UT, HIDD occurred time = 11:06:00UT

$CM = 19.5 \leq 20$. CM formula is TRUE and FV = 1.5 so within 40 minutes (11:06:00 UTC to 11:46:00 UTC) M4.0+ Earthquake is possible to occur.

M4.0+ Earthquake details

1. 4.5 185km WNW of Tobelo, Indonesia 2013-09-24 09:56:01 UTC 26.7 km
2. 7.7 61km NNE of Awaran, Pakistan 2013-09-24 11:29:47 UTC 15.0 km
3. 5.8 89km NNE of Awaran, Pakistan 2013-09-24 11:36:27 UTC 10.0 km
4. 5.1 30km NE of Awaran, Pakistan 2013-09-24 11:41:50 UTC 10.0 km
5. 4.8 73km N of Bela, Pakistan 2013-09-24 11:42:43 UTC 10.0 km
6. 4.6 16km NNW of Awaran, Pakistan 2013-09-24 11:43:54 UTC 10.0 km
7. 5.0 81km SW of Uthal, Pakistan 2013-09-24 11:44:26 UTC 10.0 km

2) Values for calculating the CM : (Using fig.2)

LIDD = 14, HIDD with Rule 2 = 21, FV = 1.5, F = 14 × 1.5 = 21, LIDD occurred time = 11:21:00UT, HIDD with Rule 2 occurred time = 11:36:00UT

$CM = 21 \leq 21$. CM formula is TRUE and FV = 1.5 so within 40 minutes (11:36:00 UTC to 12:16:00 UTC) M4.0+ Earthquake is possible to occur.

M4.0+ Earthquake details

1. 5.1 30km NE of Awaran, Pakistan 2013-09-24 11:41:50 UTC 10.0 km
2. 4.8 73km N of Bela, Pakistan 2013-09-24 11:42:43 UTC 10.0 km
3. 4.6 16km NNW of Awaran, Pakistan 2013-09-24 11:43:54 UTC 10.0 km
4. 5.0 81km SW of Uthal, Pakistan 2013-09-24 11:44:26 UTC 10.0 km
5. 4.4 36km NW of Bela, Pakistan 2013-09-24 11:47:47 UTC 10.0 km
6. 5.0 11km N of Awaran, Pakistan 2013-09-24 11:50:37 UTC 10.0 km
7. 4.7 106km WSW of Khuzdar, Pakistan 2013-09-24 12:07:06 UTC 10.0 km

3) Values for calculating the CM : (Using fig.2)

LIDD with Rule 2 = 11, HIDD = 22, FV = 1.5, F = 11 × 1.5 = 16.5, LIDD with Rule 2 occurred time = 12:15:00UT, HIDD occurred time = 12:05:00UT

$CM = 16.5 \leq 22$. CM formula is TRUE and FV = 1.5 so within 40 minutes (12:15:00 UTC to 12:55:00 UTC) M4.0+ Earthquake is possible to occur.

M4.0+ Earthquake details

1. 4.9 104km NNE of Awaran, Pakistan 2013-09-24 12:42:10 UTC 10.0 km
2. 4.1 101km S of Panjgur, Pakistan 2013-09-24 12:48:41 UTC 15.1 km
3. 5.6 102km NNE of Awaran, Pakistan 2013-09-24 13:01:39 UTC 14.5 km

CONCLUSION

My theories have proved as right by reviewing the past years deathliest Earthquakes. My theories have given answers for new ten discoveries such as 1. How solar wind affects Earth functions? 2. Why inner core rotates faster than Earth rotation speed? 3. How to predict inner core motions? 4. How to predict the 4.0+ Magnitude Earthquakes? 5. What is the relationship between Earth and Moon in Earthquakes? 6. Why Earth figure axis change and Earth rotation speed increases while in major Earthquake's occur? 7. Why some major Earthquakes are occur in Perigee Moon, full moon and Super Moon days? 8. What is therelationship between Solar Wind and Earthquake? 9. What creates the pressure waves? 10. Whymars do not have an active volcanos and moving plate tectonics recently?

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Fig.1NASA Earth Observatory image **Fig.1a. Earthquake Island in PaddiZirr, Pakistan**

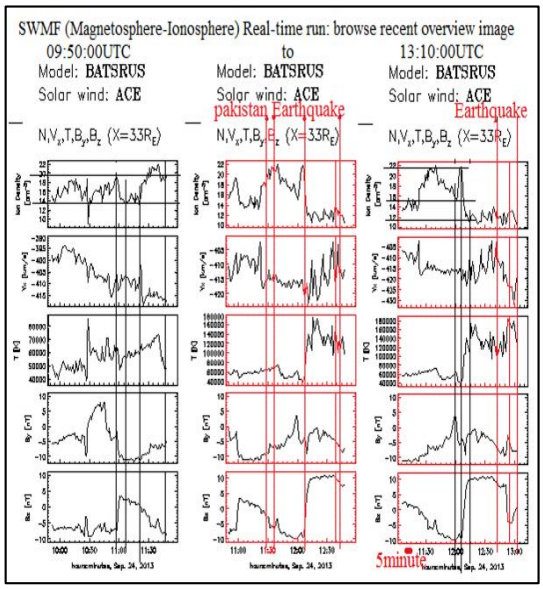

Fig.2 . Review the Magnitude 7.7 in Awaran, Pakistan.

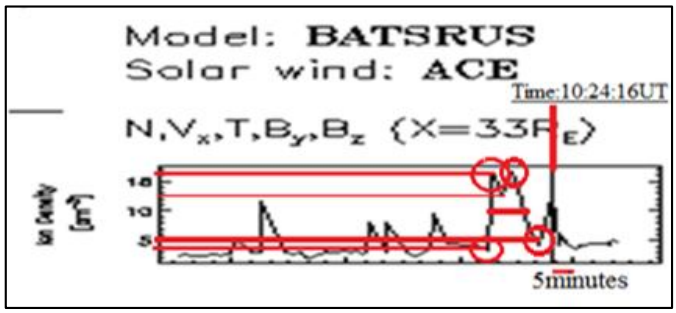

Fig.3.Calculating the Core motion and predicting the Earthquake.

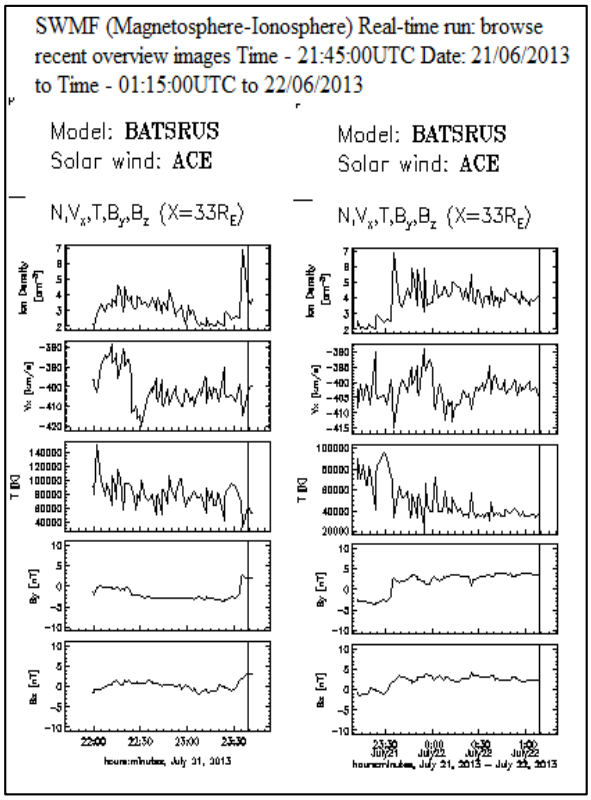

Fig.4. Review the Magnitude 5.9 Earthquake in Chabu, China.

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RESEARCH ARTICLE

Attitude, Knowledge and Role of Women in Conservation of Biodiversity.

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ABSTRACT

Biodiversity is an indication of varied biological wealth. This wealth provides human communities with food, medicine and raw material for housing and a wide range of goods and services and genetic resources for agriculture, medicine and industry. However, habitat alteration and destruction, pollution, improper land husbandry, erroneous agricultural practices, erosion of traditional knowledge about managing biological resources, lack of community initiatives and lack of appropriate legislations have destroyed the biological resources and the eco-systems. Biological resource conservation is necessary to ensure human survival and well-being. It is thus obvious that biological resources of the village community can be managed successfully, only if appropriate ecological management systems are developed by the local people themselves. Traditionally it was women, who played an important role in conserving life forms. This has been increasingly ignored due to gender inequalities and now it is the woman who bears the brunt of environmental degradation and the declining access to biological resources around her village.Therefore, in these communities managed systems, the capacity of women to nurture life is brought to the fore and rejuvenated through community managed eco-development initiatives. An important aspect of these community-managed eco-development initiatives should be the involvement and leadership of women at grassroots level. Rural women's key role as food producers and food providers links them directly to the management of genetic resources for food and agriculture and has given them unique knowledge of local species, ecosystems and their use acquired from centuries of practical experience. This paper analyses the attitude, knowledge and the major roles played by women with regard to the conservation of biological diversity.

Key words: Gender, Biological Diversity, Environmental degradation, Eco-development.

INTRODUCTION

Gender refers to the social roles that men and women play and the power relations between them, which usually have a profound influence on the use and management of natural resources. Gender roles of women and men include different labor responsibilities, decision-making processes and knowledge. Exposing and understanding the gender-differentiated biodiversity practices and knowledge of women and men enhances biodiversity conservation. Many case studies from around the world have demonstrated that by empowering women and vulnerable groups to participate as equals in information sharing and generation, education and training, technology transfer, organizational development, financial assistance and policy development, biodiversity conservation efforts become more effective and efficient.

Considerable efforts over the past fifteen years at national and international levels led the Convention on Biological Diversity (CBD) to understand the fundamental roles that women play in conserving and managing biodiversity and the need to integrate the gender perspective into their framework. The Convention is strongly committed to recognizing and promoting the integral yet distinct roles that women and men play in conserving, celebrating and sharing biodiversity. The CBD further recognizes that women and under privileged groups, require special consideration because the prevailing systems marginalizes women and do not explicitly value women's contributions to biodiversity. Lack of availability of gender sensitive biodiversity research on existing linkages between gender; biodiversity and poverty eradication; development of clear guidelines; tools and methodologies to mainstream gender into biodiversity management; integration of a gender perspective into the national biodiversity planning processes; establishment of partnerships and networks to promote gender mainstreaming within biodiversity conservation and management; and enhanced capacity building of indigenous and local community women, to participate in the CBD processes.

Gender and Biodiversity Initiatives

More diverse information on the management and ecology of plants is garnered when gendered, traditional knowledge is incorporated in basic research, ethnobotany and other studies. In Uttar Pradesh, men primarily use forest plants for fodder and mulch for agriculture. Women's user needs are more related to household applications (for example, medicines, tonics, cleansers, fiber, food and tools). Elsewhere, women's criteria reflect the diverse ways in which they use plant materials (e.g., food, nutrition and culinary preferences, thatch, mat making, fodder, fuel, leaves).

In addition, women's knowledge about "neglected" species has been tapped. Improved land tenure for women can support biodiversity. Women's secure access, to land for agriculture and home-sites leads to greater on-farm habitat protection of existing biodiversity and exploration of improved varieties. Equitable access to agricultural resources and inputs can support biodiversity conservation by intensifying production on already cleared land and reducing encroachment into fragile areas. Both women and men working with plants and animals need credit, technical support and extension services in order to mitigate or reduce potentially harmful practices such as slash-and-burn agriculture and short-term fallow rotation affecting resilience.Gendered approach brings innovation and participatory approaches to biodiversity research.

Women and agro-biodiversity

On the eve of the 21st century, tribal and rural women in developing countries hold the key to the future of the Earth's farming systems and to food and livelihood security through their roles in the selection and conservation of seed, the management of small livestock and the conservation and sustainable use of plant and animal diversity.

The role of women in environment conservation

Collection and storage of fuel, fodder and water are the accepted responsibilities of women. As the environment degrades, these basic necessities become difficult to collect. The time a woman spends on gathering fuel, fodder and water, as well as attending to household work, agricultural work and animal care, reduces her efficiency and inputs.Dr.M.S. Swaminathan, former member of the Planning Commission stated, "If men had to fetch drinking water the 230,000 villages would not have remained without provision of drinking water after several years of planned development". Traditionally, women have dealt with non-monetised biomass based subsistence economy of the household i.e. fuelwood, cowdung, crop wastes, organic manure, etc. They are aware of the forest land, livestock and human resource chain essential for sustainable development, e.g. the Kere Hosahalli village of Uttar Kanara district in Karnataka where the *Appiko* movement is effective. They demand fuel and fodder trees which meet household needs, thus lending a practical aspect to their daily requirements, e.g., in Chamoll, and in the Thar desert.

Objectives

The following objectives are framed for the purpose of present study.

- To study the socio economic status of the women respondents in the study area.
- To study women respondents' knowledge on biodiversity conservation.
- To find out the respondents' biodiversity attitudes and biodiversity conservation behavior.
- To analyze views of rural women on the loss of biodiversity and ways and means of preventing biodiversity loss.
- To suggest policy measures to improve biodiversity conservation measures.

METHODOLOGY

In this study, women respondents were selected from the joint forest management programme. The rural women's motivation and reasons for joining the village forest council and their extent of participation in joint forest management could be identified on the basis of exploratory research framework. The influence of socio-economic status on rural households can be analyzed with respect to their knowledge on biodiversity, attitude towards biodiversity and biodiversity conservation behaviour. Thus this study is partly exploratory and partly analytical in nature and aims at analyzing the biodiversity knowledge, attitudes and behaviour among the women respondents on the basis of exploratory research framework. The identified variables are correlated with socioeconomic status of the respondents and thereby it gives analytical orientation of the study.

Sampling

In this study, four districts were selected in Tamilnadu viz, Madurai, Theni, Trichirapalli and Dindigul. A total of 20 village forest councils were selected based on random sampling method. A total of 800 women respondents were surveyed. From Dindugul district, 10 villages were selected, constituting 9.80 per cent of the eligible villages. Madurai district has 98 villages. From the district 10 villages were selected, constituting 10.20 per cent of the eligible villages.. Theni district has 87 villages. Ten villages were selected from the district constituting 11.49 per cent of the eligible. Trichirapali district has 78 villages. From the district 10 villages are selected, constituting 12.82 per cent of the eligible villages. These villages have 1156 eligible beneficiaries and among them 200 households were selected constituting 17.3 per cent of the eligible respondents. In total, 40 villages were selected constituting 10.95 per cent of the eligible villages. Thus the sampling of the study is said to be stratified random sampling.

Framework of analysis

The attitude towards biodiversity conservation is measured on the basis of 5 point rating scale. The collective scores for 14 variables are taken as dependent variable Y = participation. It has been analyzed with the help of sixteen independent variables viz X_1 = Caste, X_2 = Age, X_3 = Education, X_4 = Occupation , X_5 = Family Size, X_6 = Land holding, X_7 = group duration, X_8 = Time of operation , X_9 = Duration of membership in village forest council, X10 = Man days of employment in afforesation works, X11 = Wage income through afforesation works, X12 = Income received through benefit sharing , X13 = Micro credit availed, X14 = Getting Cattle feed, X15 = Grazing livestock in joint forest management and X16 = Collection of forest produce. The index of biodiversity attitude is worked out on the basis of total scores obtained on a 5 point rating scale. The independent variables such as caste, education and occupation are measured on the basis of using dummy variables. It could be noted that higher the caste status, higher the rating score and the vice versa.

Data Collection and Analysis

The relevant data have been collected from the respondents by employing a well-structured interview schedule. The collected data were been classified and tabulated with the help of computer programming. Cross tabulation is done putting independent variables such as district status, occupational status, educational status, and caste status of the households and dependent variables viz., biodiversity attitude, biodiversity awareness and biodiversity conservation behaviour. In order to study the relationship between socio-economic status of the women and their awareness on biodiversity, the chi-square test is applied. In order to study the variation within sample and between samples, the anova two-way model is applied. The general data interpretation is done with the help of percentage and average analyses.

RESULTS AND CONCLUSION

The findings of respondent's views on biodiversity degradation reveal the following facts. The respondents rate first order reason for biodiversity degradation in terms of timber smuggling, encouragement of forest area the second order reason, over grazing the third order reason, hacking for firewood collection the fourth order reason, unscientific management practices the fifth order reason, fire damage the sixth order reason and shifting cultivation practice the last order reason. It is observed that landless household women observe the biodiversity degradation mainly in the form of encroachment of forest area. The result of caste wise analysis reveals that most backward caste and Scheduled caste household women observe the biodiversity degradation mainly in the form of timber smuggling. The result of education wise analysis reveals that higher secondary level educated and Middle level educated household women observe the biodiversity degradation mainly in the form of encroachment of forest area.

The findings of respondents' views on protection of forest resources indicate the following facts. The respondents emphasizes the first order restriction in the use of forest resources in the form of controlling over grazing, temporal closure of forest area the second, restricting the people from the collection of firewood the third, restriction in collection of fodder the fourth, forest resource use can be controlled in terms of restricting the collection of medicinal plants the fifth and preventing entry of outsiders in the forest area the last.

The result of farm wise analysis reveals that small farm household women, marginal farm household women and large farm household women state that forest resource use can be controlled through restricting the grazing in the forest area. The result of caste wise analysis reveals that scheduled caste respondents mainly state that forest resource use can be controlled through restricting the grazing in the forest area. The result of education wise analysis reveals that Primary level and middle level educated respondents mainly state that forest resource use can be controlled by the way of restricting the grazing in the forest area.

The findings of respondents' income from forest resources indicate the following facts. The rural household women earn an average income of Rs.14016.17 with respect to collection and selling of forest resources per year. The rural household women of Dindugal district occupy the first position in income generation through collection and selling of forest resources per year, rural household women of Madurai district the second, rural household women of Theni district the third and rural household women of Trichirapalli district the last.

The result of farm wise analysis reveals that small farm household women occupy the first position in income generation through collection and selling of forest resources per year, marginal farm household women the second, land less household women the third, medium farm household women the fourth and large farm household women the last. The result of caste wise analysis reveals that scheduled caste household women occupy the first position in income generation through collection and selling of forest resources per year, most backward caste household women the second, backward caste household women the third and forward caste household women the last. The result of education wise analysis reveals that primary level educated respondents occupy the first position in income generation through collection and selling of forest resources per year, middle level educated respondents the second, secondary level educated respondents the third, higher secondary level educated respondents the fourth and degree level educated respondents the last.

It could be noted that higher the educational status of household women, lower the income generation from the forest resources and the vice versa. The reason is that low level educated household women earn a major portion of their income through their wage labour and it is non wage occupation in the case of high level educated respondents. The low level educated respondents earn more income from the forest resources mainly in the form of wage labour and collection of forest products. The high level educated respondents earn more income from their agriculture and its allied activities. The findings of total household income of the respondents indicate the following facts. The rural household women earn an average income of Rs.53937.05, constituting 25.99 per cent of the income from the utilization of forest resources. The rural household women of Theni district occupy the first position in their overall income generation, rural household women of Madurai district the second, rural household women of Dindugal district the third and rural household women of Trichirapalli district the last. The high income generation in Theni district is due to more contribution of non forest resource income than that of forest resource income.

The findings of farm wise analysis reveals that small farm household women occupy the first position in their overall income generation, marginal farm household women the second, large farm household women the third medium farm household women the fourth and landless household women the last. Though the landless household women generate more per cent of income from the forest resources, their gross income is lesser than those of other landowning household women. The large farm household women and medium farm household women generate less income than the small farm household women. The medium and large farm household women generate below 15 per cent of their household income from the forest resources. Whereas, landless household women and marginal farm house holds generate a major proportion of their household income from the forest resources. The findings of caste wise analysis reveals that forward caste household women occupy the first position in their overall income generation, backward caste household women the second, most backward caste household women the third and scheduled caste household women the last. Though the scheduled caste household women generate more per cent of their income from the forest resources, their gross income is lesser than those of other caste household women. The reason is that scheduled caste household women are mainly landless household women and their major source of income is wage labour and collection and selling of forest resources. The findings of education wise analysis reveals that middle level educated household women occupy the first position in their overall income generation, secondary level educated household women the second, degree level educated household women the third, higher secondary level educated household women the fourth and primary level educated household women the last. The primary level educated household women top their position in their income level and it is due to getting more income from the agriculture and its allied activities.

The findings of respondent's biodiversity conservation behavior reveal the following facts. The respondents realize the high level biodiversity conservation behaviour in terms of counting local birds, tree planting, eco friendly consumption, replanting native species in degraded forest area, buying locally farmed produce, feeding local wild life, planting native species, protecting existing areas of native push, counting local wild life, monitoring the local streams. The respondents realize the moderate level biodiversity conservation behaviour in terms of concerning changing in local biodiversity, proper management of wild life, prevention of disappearing species, community planting, prevention on loss of biodiversity, supporting species with historical continuity, religious attachment towards biodiversity supporting organization protecting local biodiversity, encouraging community action in biodiversity conservation, protection of life support system and removing environmentally damaging weeds. The respondents realize the low level biodiversity conservation behaviour in terms of efforts to enhance biodiversity, strong emotional bond with wild life and making efforts to help restore biodiversity.

The result of farm wise analysis reveals that the large farm household women occupy the first position with respect to their overall ratings on biodiversity conservation behavior, medium farm household women the second, small farm household women the third, medium farm household women the fourth and landless farm household women the last. The result of caste wise analysis reveals that the forward caste women occupy the first position with respect to their overall ratings on biodiversity conservation behavior, backward caste women the second, most backward caste farmers the third and scheduled caste women the last. The result of education wise analysis reveals that the degree level educated women occupy the first position with respect to their overall ratings on biodiversity conservation behavior, higher secondary level educated farmers the second, secondary level educated women the third, pre primary level educated women the fourth and the primary level educated women the last.

The findings of respondents' realization on biodiversity protections are following facts. The respondents realize the high level ratings on biodiversity protection in terms of promoting ecotourism, protection of endangered animals, discoursing introduction of non native species, proper utilization of local knowledge in biodiversity conservation, multiplication of endangered species through captive breeding, discoursing mono cultivation practices, cultivation of plant species to increase the stock of biodiversity, ecological restoration of existing natural habitat and preventing illegal trade in bio resources. The respondents realize the moderate level ratings on biodiversity protection in terms of sustainable utilization of living resources, safeguarding nature's role in provision of clean air and water, discoursing shifting cultivation practices, maintenance of species level in natural ecosystem, maintaining a viable wild life population, prevention of felling trees in forest area and protection of endangered plants. The respondents realize the low level biodiversity protection in terms of reforestation in degraded forest area, promotion of nature friendly land use, prevention of genetic erosion, preventing over grazing, biological methods in conservation of wetlands, proper prevention of forest fire, afforestation in plain areas, prevention of forest fire, discoursing introduction of genetically modified crops, proper punishment for illegal utilization of bio resources, preventing hunting of wild animals, special breeding programme to increase the number of endangered species and preventing destruction of valuable areas.

The result of farm wise analysis reveals that the large farm household women occupy the first position with respect to their overall ratings on biodiversity conservation, medium farm household women the second, small farm household women the third, medium farm household women the fourth and large farm household women the last. The result of caste wise analysis reveals that the forward caste women occupy the first position with respect to overall biodiversity protection, backward caste women the second, most backward caste women the third and scheduled caste women the last. The result of education wise analysis reveals that the degree level educated women occupy the first position with respect to overall biodiversity protection, higher secondary level educated women the second, secondary level educated women the third, pre primary level educated women the fourth and the primary level educated women the last. The result of farm wise analysis reveals that the large farm household women occupy the first position with respect to overall biodiversity conservation behavior, medium farm household women the second, small farm household women the third, medium farm household women the fourth and landless household women the last. Given the vital link of women in the developmental process as seen through this study, it is

imperative that they have necessarily to be equal partners in the decision making and implementation process. The foremost concern of a society should be to recognize gender specific problems and to accept the factors, which ensure benefit to women.

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RESEARCH ARTICLE

The Effect of Selected Primary School Games on Fundamental Skills of Object Control Among the Girls and Boys Aged 7-9 Years.

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ABSTRACT

The present study evaluated the effect of selected games in primary school on object control skills of the girl and boy students aged 7-9 years. Random clustering sampling was used. The sample was 152 (76 girls and 76 boys) (Morgan Table). Pre-test was conducted of all the samples and the scores were registered by two examiners in two angles and then by camera in a different angle with them (the examiners were justified regarding the test). 76 people (38 girls and 38 boys) were selected in experiment group to perform the researcher games in their sport time. 76 students (38 girls and 38 boys) were selected in control group to do the normal sport activities. After 24-28 sessions, posttest was performed. The measures in pre-test and post-test was test of gross motor development, version 2. The results showed that without considering gender, primary school games were effective on fundamental skills of object control. It is proposed to consider primary school games as a part of physical education curriculum of primary schools.

Key words: Game, Fundamental skill, Object control, Test of gross motor development.

INTRODUCTION

Human being needs movement and game is one of the most important factors. Games date back to long times ago, man creation. Game is a part of human being life from the birth to the death and it has important role in human being history (Mahjur, 2008). Fundamental motor skills are the basis of advanced sport skills. These skills besides the effect on sport and specialized skills growth, lead to the efficiency of people movements in routine life and they should be considered in pre-school and primary school periods (galahoo, Ozmun, 2006; Translated by Hemayatalab et al., 2011). Physical education is a unique part of school period and it gives the opportunity to learn motor skills to students (Nazarian, 2003).In order to achieve a complete personality, the child should know himself to be adapted to

the environment (Qasemnejad, 2011). The game reflects the personality of the players. We cannot imagine the world of children without playing. Playing is vital in the life of children (Hughes, translated by Ganji, 2005). Playing is not the life of child but all the living aspects of children are based on games (Mahjur, 2008). Some of the researchers investigated the effect of games on motor perception skills growth (Emarati, 2008; Rahbanfar, 1998, Rezvani, 2005, Yusefi, 2010). Some of the researchers compared fundamental skills development and motor experiences (Mohammadzade et al., 2008, Nazarian, 20030.Some people considered effective factors on growth of fundamental skills as age, gender, physical composition, practice, enriching the motor experiences, activity duration among the children with development disorder and healthy children (Mckenzie, 1998; Okleyet al., 2004; Okley et al., 2001; Butterfeld et al., 2002). Children are more active in primary school. Based on the development of senses and mind, the child can perceive more compared to pre-school period.

Physical games are the old ones done in a group or individually and they are useful to reduce extra energy of body and fatigue and also they reduce aggressive behaviors. These skills are crawling, running and etc and some games as Haftsang and doge ball (Dodge ball means catching the ball and in Persian, it is "Vasati") l and etc. Thus, they achieve skill in rolling ball and targeting, physical fitness, flexibility, increasing speed and agility and happiness (Qasemnejad, 2011).The most important part of any population is children and they make the future of any society.The society with healthy children has happy society with bright future.The children mostly try to play in open spaces thus, such games in schools attracts the attention of most of the people (Zangane, 2009).High motor and physical capabilities and beautiful performance of complex skills in adolescence and youth lead to the appropriate performance of primary school games and they require optimal motor development and growth of good fundamental skills among the children and this shows a close relationship between game and fundamental skill development. It is hoped the results of the study are a good solution for teachers and parents to achieve main goals of education indirectly and turn sport time to one of the useful periods for fundamental skills growth of students.

Fundamental movements

Fundamental movements start at first as ineffective and then gradually they start voluntarily from the bigger muscles to smaller muscles. The fundamental movement model development to advanced stage depends upon various empirical factors as exercise, encouragement and training in a good environment for learning (Malina and Bochard, Translated by Bahram et al., 2010).Fundamental movements are divided into three types, these fundamental motor skills include body projection (locomotor skills), body manipulation (nonlocomotor actions), and object control. Object control includes gross and fine movements. Gross motor is including the movement of large muscles as catching, striking, dribbling and etc. and fine movements include object control skill (Shojai and Daneshfar, 20110.
Theoretical definition of object control skill: The fundamental movements of object control require one's contact with objects and it is including fine and gross movements. Gross motor is including the movement of large muscles as catching, striking, dribbling and etc. and fine movements include the movements using small muscles as writing (Shojai and Daneshfar, 2011).Dynamic theories: They evaluate game content considering different aspects as skills, importance of game, searching, work therapy, educational effects of game in children, game and life style (Mahjur, 2008).Molanoruzi et al., (2011) conducted a study "the effect of selected motor program on object control skills development of the boys aged 4-6 years. They found that selected motor group had much influence on object control skills development. Thus, by designing a good training program, we can provide the exercise opportunity for object control skills as the basis of specialized and sport skills of children.Cooly et al., (1997) in the motor skill development test for normalization of the information of primary school children and the effect of physical education delay showed that the time dedicated for physical education had significant effect on fundamental motor skills development and the higher the time of physical education per week, the higher the scores.

Loovis, Butter fields (2003) in a study " the effect of age, gender, balance and sport participation on developmental of throwing by children in grades K. " investigated the interference of age, gender, sport participation and balance on throwing development of children. They found that throwing skill development is associated with sport participation and gender among the adults and boys were better than the girls in all classes.

Study hypotheses

The study hypotheses include "General hypothesis" and "partial hypotheses".The general hypothesis of this study is: Selected primary school games were effective on the object control skills of girls and boys aged 7-9 years old.The partial hypotheses of the study include: Selected primary school games are effective on fundamental skills of object control of girls aged 7-9 years old. Selected primary school games are effective on fundamental skills of object control of boys aged 7-9 years old. There was a difference among girls and boys aged 7-9 years regarding the effect of selected primary school games on fundamental skills of object control.

METHODOLOGY

Data collection methods
Independent variable

Independent variable in this study is selected primary school games by which the students of first to third of primary school lay for 4.5 months, two sessions per week for 45min.

Dependent variables

Dependent variables in the study are body projection or locomotor skills development and Ulrich gross motor development test was used. Gross motor score was obtained of the sum of the standardized scores of manipulation skill subtest. Locomotor skills include subtests of, running, jumping, hopping, skipping, galloping, leaping, and sliding.

Results analysis method

After data extraction, descriptive statistics were used for classification, data, determining central measures (mean and median) and dispersion indices (standard deviation and variance) and various charts and tables. The normality was evaluated by Kolmogorov-Smirnov. Inference statsitics (F test and one and two-way analysis variance) was applied for data analysis. It can be said this is mentioned in details in chapter 4. The statistical analyses were done by SPSS software, version 20 and the charts were plotted by Excel software.

RESULTS

The frequency of tests in experiment and control groups is shown in Table 1. Most of the subjects were girls 951.3%) and a few were boys (48.7%) in the experiment group and in control group, many subjects were girls (50.7%) and a few were boys (49.3%).As shown in the all tables, the mean and standard deviation of the total scores of object control in experiment group in pre-test are 24.18, 6.97, respectively and 40.10, 4.67 in post-test. Also, the mean and standard deviation of the object control scores in control group in pre-test stage are 26.25, 6.81, respectively and in post-test stage as 36.84, 5.33. As shown in Table, the changes of post-test scores of object control was more than the changes of post-test than pre-test in experiment group. The means of the variables are shown based on gender in experiment and control groups in post-test and pre-test. To test the hypotheses and responding the study questions, one-way and two-way covariance analyses were used. One of the assumptions of these statistical methods is normality of the data. Kolmogorovsmirnov test was applied for to evaluate the normality.

In the first hypothesis the selected primary games were effective on fundamental skills of object control of the girls aged 7-9 years old.Covariance analysis was used to test the above hypothesis. The investigations regarding

homogeneity covariance of variances via Levene test showed that these assumptions are not observed (F=10.81, P<0.01).The results of homogeneity covariance analysis of regression showed that the interaction between the groups (experiment and control) and variable (object control pre-test score) was not significant (F=0.003, P>0.05). It means that regression gradient for experiment and control groups was similar and this assumption is observed. As shown in the Table 9, by pre-test score, there was a significant difference between object control scores of the girls of experiment and control groups (Eta coefficient= 0.110, P<0.01, F=9.15). Table 7 showed that the changes of the mean of post-test scores of object control of girls compared to pre-test of experiment group were more than the changes of post-test mean compared to pre-test in control group. It can be said that the selected primary games are effective on fundamental skills of object control of the girls aged 7-9 years old. This hypothesis is supported. The effect is 0.110, it means that 0.11 of the changes are due to participation in games in primary schools (group membership).

In the Second hypothesis the selected primary school games on fundamental skills of object control of boys aged 7-9 years. To test the above hypothesis, one-way covariance analysis is used. The investigations of homogeneity covariance analysis of variances via Leven test showed that these are included (F=0.13, P>0.05).The results of homogeneity covariance analysis of regression gradient showed that the interaction between the groups (experiment and group control) and variable (pre-test of object control) was not significant (F=0.001, P>0.05). It means that regression gradient for experiment and control groups is similar and this assumption is observed.As shown in Table 10, by controlling pre-test score, there is a significant difference between object control scores of boys in experiment and control groups (Eta coefficient =0.373, P<0.01, F=42.16). Based on Table 7, the changes of post-test scores of object control of boys compared to pre-test mean in experiment group were more than the changes of post-test compared to pre-test in control group. Thus, it can be said that selected primary games were effective on fundamental skills of object control of boys aged 7-9 years old. The effect is 0.373, it mean the 0.37 of the post-test changes of participating in primary school games (group membership).

In the Third hypothesis there is a difference between the girls and boys aged 7-9 years old regarding the effect of selected primary school games on fundamental skills of object control.Two-way covariance analysis was used to test this hypothesis. The results of homogeneity covariance analysis by Levene's test showed that this assumption is not observed (F=5.88, P<0.01). The results of two-way variance analysis are shown.Table 11 showed that only the group effect on dependent variable was significant. As shown in the Table, the gender effect showed that ignoring the interference of game group, there was no significant difference among the girl and boy children in terms of object control (F=3.61, P>0.05). The effect of group showed that there is a significant difference between experiment and control groups of children in terms of object control variable (F=43.55, P<0.001). Table 7 showed that in experiment group, the difference of post-test score compared to pre-test sore was more than mean difference post-test in object control compared to pre-test of object control in control group. It can be said that the games approved in primary school were effective on object control skill of students. The coefficient of the effect is 0.230, it means the 0.23 of post-test changes of participation in primary school games.As shown in Table 11, there is no interaction between group and gender in the mean of the object control scores (F=3.62, P>0.05). This finding showed that children scores in experiment and control groups in object control variable are not affected by gender and the group (performing the games of primary schools) and it increased the object control of students and it is not dependent upon gender. Thus, the effectiveness of approved primary school games was similar on increasing object control skill of girls and boys.

DISCUSSION AND CONCLUSION

The findings of Table 11 showed that by controlling pre-test score, there is significant difference between object control scores of experiment and control groups (Eta coefficient= 0.110, P<0.01, F=9.15). Table 7 showed that the changes of the mean of post-test scores of object control of girls compared to pre-test of experiment group were more than the changes of post-test mean compared to pre-test in control group. It can be said that the selected primary games are effective on fundamental skills of object control of the girls aged 7-9 years old. This hypothesis is supported. The effect is 0.110, it means that 0.11 of the changes are due to participation in games in primary schools

(group membership). In other words, the games were effective on the skills of catching ball, throwing from above shoulder, rolling, dribble, striking by foot and bouncing. This result is in line with the studies of Nazarian (2003), Motaharian (2004), Akbari (2006), Eskandari (2007), Zangane(2008), Keyhani (2010), Jokar (2011), Molanoruzi (2011), Mckenzie (1998), Jack Kolin et al., (2003) and Wang (2004). Indeed, in all the studies the effect of exercise opportunities on object control skill is evaluated and one of the reasons of this consistency is the intervention of the games in which mostly the object control skills are applied.

As shown in Table 10, by controlling pre-test score, there is a significant difference between object control scores of boys in experiment and control groups (Eta coefficient =0.373, P<0.01, F=42.16). Based on Table 7, the changes of post-test scores of object control of boys compared to pre-test mean in experiment group were more than the changes of post-test compared to pre-test in control group. Thus, it can be said that selected primary games were effective on fundamental skills of object control of boys aged 7-9 years old. The effect is 0.373, it mean the 0.37 of the post-test changes of participating in primary school games (group membership).In other words, the games were effective on the skills of catching ball, throwing from above shoulder, rolling, dribble, striking by foot and bouncing. This result is in line with the studies of Nazarian (2003), Motaharian (2004), Akbari (2006), Eskandari (2007), Zangane (2008), Keyhani (2010), Jokar (2011), Molanoruzi (2011), Kosari et al., (2011), Miller (1987), Cooly et al., (1997), Mckenzie (1998), Jack Kolin et al., (2003) and Wang (2004). Indeed, in all the studies the effect of exercise opportunities on object control skill is evaluated and one of the reasons of this consistency is the intervention of the games in which mostly the object control skills are applied. Table 11 showed that only the group effect on dependent variable was significant. Table 7 showed that in experiment group, the difference of post-test score compared to pre-test sore was more than mean difference post-test in object control compared to pre-test of object control in control group. It can be said that the games approved in primary school were effective on object control skill of students. The coefficient of the effect is 0.230, it means the 0.23 of post-test changes of participation in primary school games.

As shown in Table 11, there is no interaction between group and gender in the mean of the object control scores. This finding showed that children scores in experiment and control groups in object control variable are not affected by gender and the group (performing the games of primary schools) and it increased the object control of students and it is not dependent upon gender. Thus, the effectiveness of approved primary school games was similar on increasing object control skill of girls and boys. This finding is in line with the studies of Azami and Jafari but is not consistent with the studies of Loovis L. et al., (2009), Dailay p. (2007), Butter field &Loovis (1993) and believed the girls were not better in motor skills and boys in object control skills. It seems that gender and development are effective in fundamental skills of pre-school and early periods of life of the child. The reason of inconsistency of this finding with the researches is the age of subject and in the previous studied, the children aged below 7 years were considered. This study evaluated the children aged 7-9 years old. Based on the development period, fundamental skills in lower ages defined the differences of girls and boys and these differences are not any more at older ages. It can be said:The selected primary school games had significant effect on fundamental skills of object control of the girls aged 7-9 years old. The selected primary school games had significant effect on fundamental skills of object control of boys aged 7-9 years old.There was no significant difference between the girls and boys aged 7-9 year old regarding the effect of selected primary school games on fundamental skills of object control. The selected primary school games were effective on fundamental skills of object control of the girls aged 7-9 years old. The selected primary school games were effective on fundamental skills of object control of the boys aged 7-9 years old. Finally, there was no significant difference between the girls and boys aged 7-9 years regarding the effect of selected primary school games on fundamental skills of object control.

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Table 1- Frequency distribution and subjects' percent in experiment and control groups based on gender

%	F	Gender	Group
51.3	39	Girl	Experiment
48.7	37	Boy	
100	76	Total	
50.7	38	Girl	Control
49.3	37	Boy	
100	75	Total	

Table 2- The frequency distribution and subjects' percent in experiment and control groups based on age

%	F	Age	Group
32.9	25	7 years	Experiment
30.3	23	8 years	
36.8	28	9 years	
100	76	Total	
33.3	25	7 years	Control
37.4	28	8 years	
29.3	22	9 years	
100	75	Total	

Table 3- The mean and standard deviation of IQ of experiment and control groups

Max	Min	SD	Mean	N	Group
128	100	6.45	111.96	76	Experiment
131	100	6.43	111.16	75	Control

As shown in Table 3, the mean and standard deviation of IQ of subjects of experiment group were 111.96, 6.45, respectively and in control group as 111.16 and 6.43.

Table 4- The mean and standard deviation of the weight of subjects in experiment and control groups

Max	Min	SD	Mean	N	Group
41	20	4.77	26.11	76	Experiment
40	19	4.79	25.28	75	Control

As shown in Table 4, the mean and standard deviation of the weight of subjects are 26.11 and 4.77, respectively and in control group 25.28 and 4.79.

Table 5- The mean and standard deviation of height of subjects in control and experiment groups

Max	Min	SD	Mean	N	Group
1.45	1.17	0.05	1.27	76	Experiment
1.40	1.15	.05	1.26	76	Control

As shown in Table 4-6, the mean and standard deviation of height of subjects in experiment group were 1.27, 0.05, respectively and in group control 1.26, 0.05.

Table 6- The mean and standard deviation of body mass index of subjects in experiment and control groups.

Max	Min	SD	Mean	N	Group
20.09	12.80	1.79	16.03	76	Experiment
20.70	13.19	1.69	15.58	75	Control

As shown in Table 6, the mean and standard deviation of body mass index of the subjects of experiment group are 16.03, 1.79, respectively and in control group 15.58, 1.69%.

Table 7- Descriptive statistics of study variables in pre-test and post-test based on gender

Variable	Statistical index	Test	Gender	Group
Object control				
23.69	Mean	Pretest		
4.87	SD		Girl	
38.69	Mean	Post-test		
4.24	SD			
24.70	Mean	Pretest		
8.70	SD		Boy	Experiment group
41.59	Mean	Post-test		
4.69	SD			
24.18	Mean	Pretest		
6.97	SD		Total	
40.10	Mean	Post-test		
4.67	SD			
23.55	Mean	Pretest		
6.47	SD		Girl	
35.63	Mean	Post-test		
6.24	SD			
29.02	Mean	Pretest		
6.04	SD		Boy	Control group
38.08	Mean	Post-test		
3.91	SD			
26.25	Mean	Pretest		
6.81	SD		Total	
36.84	Mean	Post-test		
5.33	SD			

Table 8- The results of normality test of data.

Significance	z	SD	Mean	Variables	Group
0.332	0.947	4.74	38.94	Projection	Experiment
0.376	0.91	4.67	40.10	Object control	
0.405	0.89	4.67	38.44	Projection	Control
0.122	1.18	5.33	36.84	Object control	

Table 9- The results of one-way covariance analysis to compare the mean of the object control scores of girls aged 7-9 years old in two groups.

Eta square	Significance level	F	Mean of squares	Degree of freedom	Sum of squares	Variance
0.349	0.000	39.60	741.59	1	741.59	Pre-test score
0.110	0.003	9.15	171.35	1	171.35	Group
			18.72	74	1385.55	Error
				77	108759	Total

Table 10- The results of one-way covariance analysis to compare the mean of object control scores of the boys aged 7-9 years old in both groups.

Eta square	Significance level	F	Mean of squares	Degree of freedom	Sum of squares	Variance
0.434	0.000	54.36	584.41	1	584.41	Pre-test score
0.373	0.000	42.16	453.28	1	453.28	Group
			10.75	71	763.26	Error
				74	119018	Total

Table 11- The results of two-way covariance analysis to compare the mean of object control skill in experiment and control groups based on gender.

Eta square	Significance level	F	Mean of squares	Degree of freedom	Sum of squares	Variance
0.369	0.000	85.38	128.24	1	1282.24	Pre-test score
0.024	0.059	3.61	54.33	1	54.33	Gender
0.230	0.000	43.55	654.13	1	654.13	Group
0.024	0.059	3.62	54.36	1	54.36	Group*gender
			15.01	146	2192.58	Error
				151	27777	Total

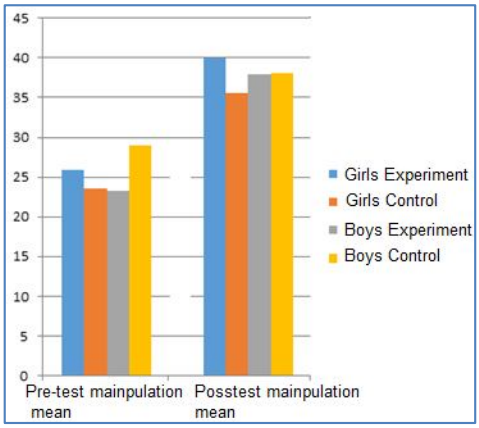

Figure 1 .The mean of body projection skills and object control in pre-test and post-test in control and experiment groups based on gender.

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RESEARCH ARTICLE

Studies on Mechanical Properties of CO 4 Onion Bulb (*Allium cepa* L. var. *aggregatum* Don.)

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ABSTRACT

Mechanical properties describe the behaviour of the material under various types of loading. Knowledge of the mechanical properties can help in designing the storage structures, equipments for handling, transportation, conveying and processing of vegetables.It includes mainly filling angle of repose, emptying angle of repose, coefficient of friction, firmness and crushing strength of CO 4 onion bulbs. The average value of filling and emptying angle of repose were 24.36° and 37.36° for fresh onion bulband the corresponding value of three months stored onion bulb were 14.76° and 41.83°. The emptying angle of repose for fresh and three months stored onion bulbs was higher than the filling angle of repose. The coefficient of friction was high in rubber surface and lowest in polished wooden card board surface. The firmness and crushing strength of CO 4 onion bulbs were reducedfrom the fresh sample to three months stored onion bulbs.

Key words: Angle of repose, aggregatum onion, mechanical properties, crushing strength.

INTRODUCTION

Onion is one of the most important vegetable crops in world.In India, onion is the fourth most important commercial vegetable crop covering an area of 5.93 lakh hectareswhich is 10per cent of total vegetable area and is highly valued. The production of onion in the country is 7.52 million MT accounting for 8.9 per cent of the total vegetable production. The total onion export from India was 1.66 million MT worth Rs. 2319.43 crores during the year 2009-10. It occupies around 10.5 per centof vegetable production in our country. Maharashtra (28.9 %) has the highest productionof onion in India followed by Karnataka (22.4 %), Gujarat (10.4 %), Madhya Pradesh (6.5 %), Andhra Pradesh (4.9 %), Rajasthan (2.7 %) and Haryana (2.6 %) [1].

Small onions are also known asshallots, multiplier or aggregatum onion. This onion is produced only in southern states of India viz., Tamil Nadu, Andhra Pradesh and Karnataka. More than 80 per cent of 3.2 lakh tonnes of onion produced in Tamilnadu from an area of 0.30 lakh ha during 2008-09 constituted of small onion. The frictional properties such as coefficient of friction, angle of repose and are important in designing of storage bins, hoppers, chutes, pneumatic conveying system, screw conveyors, forage harvesters, threshers etc., [2]. Frictional properties help to understand the ease with which the given material moves over the given surfaces.Mechanical properties describe the behaviour of the material under various types of loading. Knowledge of the mechanical properties can help in designing of storage bins, hoppers, chutes, pneumatic conveying system, screw conveyors, forage harvesters, threshers etc., [2] and processing of vegetables. These properties help to understand the ease with which the given material moves over the given surfaces. It includes mainly filling angle of repose, emptying angle of repose, coefficient of friction, penetration load and crushing strength of CO 4 onion bulbs.

The objective of the current study was to determine the different mechanical properties of the fresh and three months stored aggregatum onion bulbs (small size).The data is required for the studying behavior of the product during the post harvest operations such as curing, transportation, sorting, grading, packaging and storage processes. Geometrical properties were used tocompile a data base for the CO 4 variety.

MATERIALS AND METHODS

CO 4 was developed and released by the Tamil Nadu Agricultural University, Coimbatore. It is composed of 3-4 bulbs of onion joined together. It is red in colour and spherical in shape. It is a high yielding variety with recorded productivity of 20 tonnes/ha and with a crop duration of 65 days. This variety is cultivated in major onion producing States viz., Karnataka, Tamil Nadu and Andhra Pradesh of India. Freshly harvested and three months stored CO 4 bulbs were brought from farmer's field. Shoot and root were removed and bulbs were separated from the multiplier (bunch) for estimating the properties.

Mechanical properties

Mechanical properties describe the behaviour of the material under various types of loading. Knowledge of the mechanical properties can help in designing the storage structures, equipments for handling, transportation, conveying and processing of vegetables [3].

Angle of repose

Angle of repose is the angle with the horizontal at which the sample will stand when piled. The size, shape, moisture content and orientation of the samples have a desired influence on the angle of repose.

Filling angle of repose

The angle of repose was the angle between the base and the slope of cone formed on a free vertical fall of the sample to a horizontal plane. Five kg of onion was piled over a horizontal surface. The radius of the pile was calculated from the circumference of the pile and the slant height of the pile was determined by measuring actual slope of the pile. The angle of repose was calculated by using the following formula and reported value is mean of three replications.

$$\theta = \tan^{-1}\left(\frac{h}{r}\right) \qquad \ldots (1)$$

Where,

θ - angle of repose, degree

h - height of pile, cm

r - radius of pile, cm

Emptying angle of repose

To determine the emptying or dynamic angle of repose, a rectangular box (10 cm width and 15 cm length) with removable front panel was used. The box was filled with the onion bulbs, and then the front panel was quickly removed, allowing the onion bulb to flow and assume a natural slope. The angle of repose was calculated from the measurement of the depth of free surface of the sample at the centre. The experiment was replicated thrice and average values were reported [4].

Coefficient of friction

The coefficient of friction between materials is equal to the tangent of the angle of internal friction for the material. The frictional coefficient depends on the shape, surface characteristics and moisture content.

The experimental set up consisted of frictionless pulley fitted on a frame and a topless and bottomless hollow circular sample container (94 mm Diameter x 98 Height mm), connected to the weighing pan through a frictionless pulley (Fig.1). The onion bulbs were filled in the sample holder and the weight was added to the weight pan until the sample holder just started moving, overcoming the friction on the surface. From the weights in the pan (F) and the weight of the onion bulbs (N) the coefficient of friction was calculated using the formula [4]. The coefficient of friction was determined using the following formula [5].

$$\mu = \frac{F}{N} \quad \ldots(2)$$

Where,

μ - coefficient of friction

F - weight of the onion, kg

N **-** weight of the force applied, kg

The experiment was performed using different test surfaces like galvanized iron, mild steel, aluminum, rubber and polished wooden card board surfaces. Experiments were replicated three times by emptying and refilling the container with different samples every time and the average value was determined and recorded as the average static coefficient of friction.

Penetration load/Crushing load

Penetration load/Crushing loadproperties are used for estimating the readiness of crops for harvest and evaluation of storage quality for market and processing plants (Singhal and Samuel, 2003). Food texture analyser (Make: Stable Microsystems, England and model: TA XT2i) with Texture Expert Exceed 2.46 version software was used for the measuring crushing strength and penetration load or puncture test.

Puncture test or penetration load/strength (firmness)

The puncture or penetration load/strength was determined by using stable micro system - Texture Expert Exceed Analyzer. The P/4 needle (4.0 mm diameter) probe was used to measure the puncture resistance of the onion bulb. Individual onion bulbs were supported at an angle (45° from the polar axis) so as to enable the probe to penetrate the onion through the shoulder. Force required to penetrate the onion was recorded. Three replications were done.

Crushing load

Crushing implies the partial or complete destruction of product.Individual onion bulb was set upon a heavy duty platform. The P/75 (75 mm diameter aluminum platen) probe was brought in contact with the onion and a compression force was applied. Three replications were done.

The maximum force required for penetrating and crushing of the onion bulb to a depth of 5 mm was selected from the force-deformation curve and recorded as penetrating and crushing load. The experimental condition for the onion bulbs set in the equipment for the both the tests (penetration load/strength test and crushing load test) are listed in Table 1.

RESULTS AND DISCUSSION

All the properties were assessed at anaverage moisture content of 83.45±1.10 per cent (wb) for the fresh onion bulbs and 81.82 ±1.01 per cent (wb) for the three months stored onion.

Mechanical properties

The mechanicalproperties include the angle of repose, coefficient of friction, penetration load and crushing load of the fresh and three months stored onion bulbs. The average value, SD and CV of the CO 4 cultivar are given in Table.4.2 and discussed in this section.

Angle of repose

Results showed that the filling and emptying angle of repose of the fresh and three months stored onion bulbs were 24.36 (24°21'36'') ± 2.58 to14.76 ± 0.88 (14° 45' 36'') and 37.36 ± 3.41 (37°21'36'') to 41.83 ± 2.45 (41°49'48'') degree with CV value of 10.58 to 5.97 and 9.13 to 5.86 per cent. Thus, there was a reduction of the 39.41 per cent in filling angle of the three months stored onion. But, there was a increase of the 11.96 per cent of the emptying angle of repose.The emptying angle of repose was higher than the filling angle of repose. The filling angle of repose was reduced from fresh onion bulb to three months stored onion bulbs whereas in the emptying angle of repose was increased during storage. These results are in agreement with the observation recorded for coffee parchment.[4]

Coefficient of friction

The coefficient of friction of fresh and three month stored CO 4 was 0.57± 0.08 to 0.52 ± 0.05, 0.52 ± 0.08 to 0.44 ± 0.10, 0.51 ± 0.04 to 0.46 ± 0.04, 0.56 ± 0.02 to 0.41 ± 0.04, 0.50 ± 0.04 to 0.39 ± 0.05 and 0.72 ± 0.04 to 0.58 ± 0.04 for the galvanized iron surface, stainless steel surface, aluminum surface, mild steel surface, polished wooden card board surface and rubber surface respectively.The results of the coefficient of friction of fresh and three months stored CO 4 is presented in Table. 2. There was a reduction in the values due to storage. The coefficient of friction was high in rubber surface and lowest in wooden card board surface. For *jatrophacurcas* seeds at 9 per cent moisture content for all sizes (0.2 – 0.9 g) , the coefficient of friction was high on the rubber surface (0.44±0.02) compared to plywood (0.35±0.02) , aluminium (0.36±0.04) and stainless steel surfaces (0.22±0.02) [6].

Puncture strength or Penetration load

The mean values of penetration load of fresh and stored onion bulbs were 28.82±3.96 and 25.03 ±3.81 N with the coefficient of variation from 13.73 to 15.21. These values are in agreement with the results of [7] with the mean penetration load of 27.60 ± 0.40 N and with a CV of 14.35 for the Giza (20) white onion cultivar (<4 cm - small). The load required for penetrating or puncturing the fresh onion was more compared to the three month stored onion bulbs. This may be due to the skin of the onion bulbs loosing the neck tightness (compaction of the skin layers) during storage periods. Fig. 2 shows the decreasing trend of the penetration strength during storage of CO 4 onion bulbs.

Crushing strength or crushing load

Crushing load of fresh and three months stored onion bulbs ranged from 146.97±24.76 to 70±15.33 N with the CV of 16.85 to 21.76 per cent respectively. The result showed that the force required for the crushing fresh sample was two times more than the three months stored onion sample. This result agrees with observations of [8] for large size (>6cm) of garlic cloves which had a mean crushing load of 155±22.6 N.Fig.3 shows the crushing strength was gradually decreased from fresh onion bulbs to three months stored onion bulbs.

CONCLUSION

A complete set of mechanical properties were obtained for the freshand three months stored multiplier onion. The properties were assessed at an average moisture content of 83.45±1.1 per cent (wb) for the fresh onion bulbs and 81.82 ±1.01 per cent (wb) for the three months stored onion.The average value of filling and emptying angle of repose were 24.36° and 37.36° for fresh onion bulb and the corresponding value of three months stored onion bulb were 14.76° and 41.83° respectively. The emptying angle of repose for fresh and three months stored onion bulbs was higher than the filling angle of repose. The coefficient of friction was high in rubber surface and lowest in polished wooden card board surface. The firmness and crushing strength of CO 4 onion bulbs were reducedfrom the fresh sample to three months stored onion bulbs.It was also observed that storage of the bulbs resulted in reduction of values of most of themechanical properties except emptying angle of repose for the fresh and three months stored onion bulbs. The observations of the study are a database for the CO 4 bulbs. The data could be used for designing processing equipments, storage structures and transport.

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Table 1. Parameters for penetration load/strength test

Particulars	Parameters
Mode	Measure Force in Compression
Option	Return to start
Pre-Test Speed	1.0 mm/s
Test Speed	1.0 mm/s
Post-Test Speed	10.0 mm/s
Distance	5 mm (Half of the sample diameter)
Trigger Type	Auto
Data Acquisition Rate	200 pps
Probe	i. 4 mm diameter stainless steel cylinder probe (P/4) -Penetration load

	ii. 75 mm diameter aluminum platen probe (P/75) - crushing load
Load cell	50 kg
Plat form	Heavy duty platform (HDP/90)

Table 2. Coefficient of friction of fresh and three months stored CO 4 onion bulbs

Particulars	Initially stored onion			After three months stored onion			Change in value (%)
	Mean	SD	CV (%)	Mean	SD	CV (%)	
Galvanized iron sheet	0.57	0.08	13.22	0.52	0.05	8.67	(-) 8.77
Stainless steel sheet	0.52	0.08	16.12	0.44	0.10	22.74	(-) 15.38
Aluminum sheet	0.51	0.04	7.66	0.46	0.04	7.97	(-) 17.86
Mild Steel sheet	0.56	0.02	4.03	0.41	0.04	10.37	(-) 19.61
Polished wooden card board	0.50	0.04	8.93	0.39	0.05	13.12	(-) 19.64
Rubber	0.72	0.04	5.51	0.58	0.04	6.41	(-) 19.44

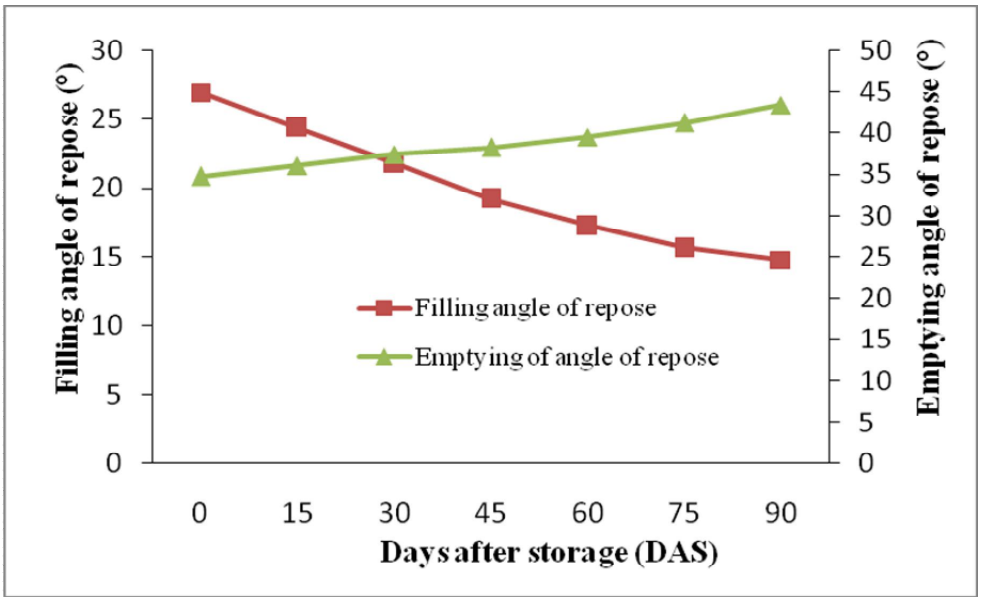

Fig.1 Angle of repose for the fresh and three months stored CO 4 onion bulbs.

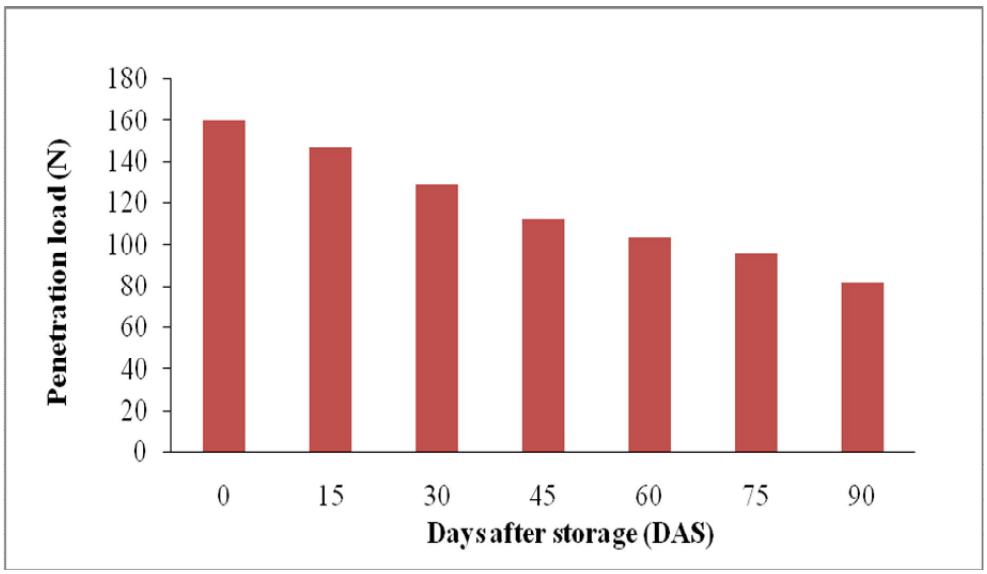

Fig. 2.Penetration load of the fresh and three months stored CO 4 onion bulbs

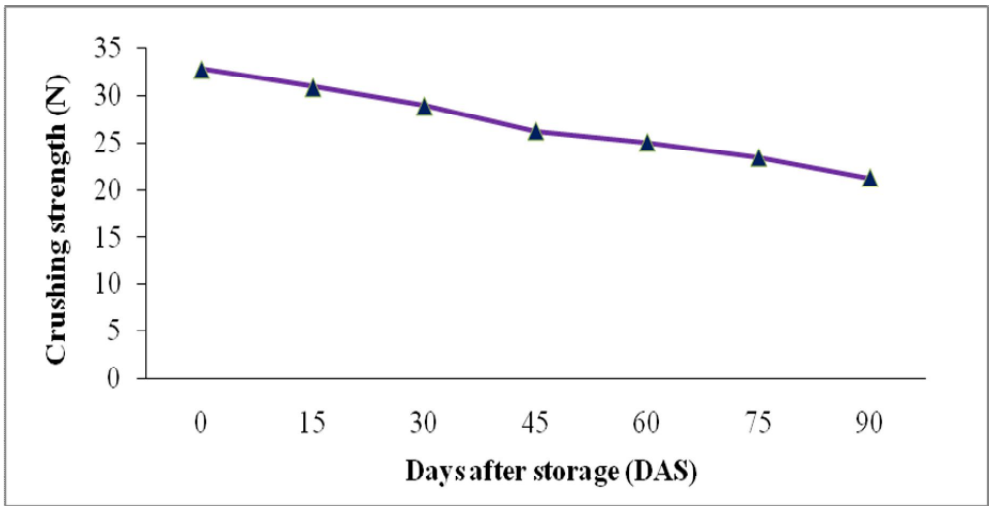

Fig. 3.Crushing strength of the fresh and three months stored CO 4 onion bulbs

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RESEARCH ARTICLE

Organizational Conflict Management and the Relationship Between Perceived Organizational Justice and Job Conscience among Staffs of Islamic Azad University of Zahedan.

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ABSTRACT

Conflict management manages the organization under conflict as well and it creates balance between the staffs and organization and eliminates the conflict. Generally, conflict management is definition process of the good role of conflict among the groups and appropriate application of the relevant techniques to eliminate them for organizational effectiveness. By conflict management, organizational managers can use various strategies and styles to cope up with them.The highest strategies used in conflict management are participatory method based on trust. Coping up with conflict and its management is important in success of managers.The present study aimed to determine the relationship between perceived organizational justice and job conscience among the staffs of Islamic Azad University of Khorasegan. The study was descriptive-correlation design and it was done by field method. There were 310 staffs and the sample size was computed by Cochran's formula as 162 people. The data collection measuresare demographic questionnaire, perceived organization justice questionnaire and job conscience questionnaire.

Key words: Conflict organization, Strategy, Organizational justice, Job conscience.

INTRODUCTION

The various people with different features, needs, beliefs, expectations and perceptions cause conflict in organizations. The underlying structure on organizations based on hierarchy and vertical and horizontal differences, the presence of flexible and strict administrative systems, the sub-systems and various groups with various benefits

and goals, incomplete communication system, the shortage of resources and facilities namely inappropriate management turned organizations – their main goal of them is adapting the people and groups to their goals and ideals- into vulnerable institutions to different conflicts, tensions (Robins, 1991).

The term conflict has different interpretations. Conflict is a type of behavior between organizational groups (IzadiYazdanAbadi, 2000). Conflict is an obvious argument between two dependent parties with inconsistent goals, concepts, values and beliefs (Schermerhorn, 1994). Finally, conflict is a social condition in which two or some people argue about basic issues of organization or they show conflict to each other.Various views are regarding conflict. Traditional view to conflict is not suitable and it was equal to the lack of respect, destruction and illogical issues. Human relations view considered conflict as natural in all groups and organizations. Interactive view believed that conflict is positive force in group and it is also necessary for effective performance of group (Castello and Zalkind, 1993). Today, different types of conflict are defined as established conflict that is arising from the nature and goals of organization or new conflict arising from formal and informal interactions of employees in routine activities. Personality conflict is defined as the personal disagreement or dissatisfaction of people to each other (Pondy, 1967).

The study of justice in work spaces is increased considerably in recent years (Zhang et al., 2009). Due to the extension of the outcomes of observing justice, the study of the effects of perception of justice in organizations took the attention of many of researchers of human resources, organizational behavior and organizational-industrial psychology (Bish et al., 2004). Generally, various theories about organizational justice are evaluated in the form of three major waves. First wave is based on distributive justice, second wave on procedural justice and third wave is based on international justice (Azgoli, 2004). These three dimensions of justice interact with each other and create general perceived justice of people in work spaces. Distributive justice refers to the perceived justice of organizational outcomes (Forret, Sue Love, 2008). Procedural justice refers to the justice received from the methods used for decision making about assignment and results (Olson et al., 2007). Interactional justice refers to the quality of behavior among people felt by any person (Afje, 2006, 332).

Some researchers raised five dimensions for organizational citizenship behavior (OCB) (cited of Robieet al.,2005). These dimensions include altruism, courtesy, conscientiousness, civic virtue, and sportsmanship. Job conscience is the behavior for the benefit of organization not for the benefit ofemployees **(**Haigh and Pfau,2006). Conscience is as the high goals of a person to achieve successful work results and create purposeful behaviors (2009Weaven et al.). In job conscience, a person does the task appropriately by being inspired of his ethics (Dadgaran, 2005). Job conscience indices are doing task appropriately, completing the task, doing the tasks at appropriate time, saving the time and costs, distinguishing useful tasks from non-useful tasks for organization, preferring organization to self and belonging (Khani, 2002). As conscientious people are hardworking, ambitious and stable can do what is required for completing the tasks. Thus, success depends upon dependence, mild interpersonal relations, hardworking and innovation to solve a problem in work space. Conscientious people are less involved with cautious behaviors compared to the people with less conscientiousness (2007., Jawahar and Carr).

Equality theory is a motivational model explaining people effort to achieve justice and fairness in social and exchange interactions. According to equality theory, employees and members of organization compared themselves with each other. Employees compare the results of their work to inputs in the task with others. Inequality feeling causes tension and conflict and affects the quality of work of employees and job satisfaction. In such organizations, work norms are less internalized and people commitment is reduced and job conscience is reduced (Rahmati, 2003). Nothing is more terrible than the lack of justice for organization development. Today, achieving organizations goals depends mostly upon appropriate performance of employees. One of the barriers of organizations in achieving the goals is the weakness of job conscience or job commitment among employees. To fulfill the goals, University needs efficient employees with high job conscience. In order than people show more knowledge and skills in organization and act effectively with work conscience, it is necessary to have justice in organization and people don't feel discrimination. As university is the center of development and growth and customers are young, the tasks of this society class are of high sensitivity. Organizational justice is one of the important factors in job conscience and employees motivation for

honest work. Based on the influences of each of two components on organization performance, a few researches are conducted regarding the investigation of the relationship between two variables. The main problem of this study is evaluation of the relationship between perceived organizational justice and job conscience of employees of Islamic Azad University of Khorasegan. Klendauer R, Deller (2009) conducted a study titled "Organizational justice and managerial commitment in corporate mergers". The results showed that although each fairness dimension is positively correlated with effective commitments, only interactional organizational justice had unique association with it. The results showed that instrumental evaluations and trust can act as an adjusting variable.

Study questions

- Is there any simple and significant association between perceived organizational justice and each of the relevant dimensions with job conscience of employees**?**
- Are there any multiple significant associations between justice components (distributive, procedural and interactional justice) with job conscience**?**
- Are demographic variables (gender, work experience, education, type of employment and work field) effective on the relationship between perceived organizational justice and job conscience of employees?
- How is the structural equations modeling of causal relation between organizational justice and job conscience of staffs of Azad University of Khorasegan?
- Is there any difference between justice components (distributive, procedural and interactional justice) based on demographic variables (gender, work experience, education, employment type and work field)?

METHODOLOGY

The study is descriptive-correlation design. The study population is including all full-employment and temporary employment staffs of Islamic Azad University of Khorasegan. 310 people were reported from job search office of the university. At first a questionnaire was distributed among a sample 30 people randomly to determine sample size and pre-variance of variables was computed. Then, the main sample size 162 was calculated by Cochran's formula. Stratified random sampling was used. The study population was classified based on work units and the sample size for each of work units is as mentioned as follows: For data collection, two organizational justice and job conscience questionnaires were used. To determine validity, the views of experts were used. Cronbach's alpha coefficient was 87% for organizational justice questionnaireand 86% for job conscience questionnaire for reliability. Data analysis method: The collected data were analyzed by multi-variate regression analysis (to define the share of each of justice components in job conscience), Pearson Correlation coefficient (to evaluate the relationship between justice components with job conscience), uni-variate t test (to compare the mean of job conscience and organizational justice with assumed mean (3), Z Fischer (to obtain significant difference or insignificant difference between correlation coefficient of perceived organizational justice and job conscience of employees based on gender, work experience, education, type of employment and work field) and multi-variate variance analysis (to compare the components of organizational justice components based on demographic factors).

RESULTS

Based on the results of the table 2, four components of organizational justice and general index of justice with job conscience were significant at the level 0.015.Table 11, multiple regression of procedural justice determines alone 24% of job conscience. By interactional justice, the determined variance increased to 28% and the relationship between distributive justice and job conscience was not significant.Table 4, the best predictor of job conscience is procedural, interactional justice. For the increase of standard deviation of procedural justice of job conscience as 0.356 units and for one unit increase of standard deviation of interactional justice, job conscience is increased as 0.233.Job conscience=81.31+0.356 (procedural justice)+0.233 (interactional justice).

Table 5, correlation coefficient between job conscience and perceived organizational justice based on gender is significant at the level P≤0.05. Thus, there is a significant association between job conscience and perceived organizational justice among men and women. As calculated Z is smaller than critical value of table at the error level 5% (1.96), based on z Fischer test, there is no difference between correlation relation between men and women.

Based on results of Table 6, correlation coefficient between job conscience and perceived organizational justice based on work experience is significant at the level P≤0.05. Thus, there is a significant association between job conscience and perceived organizational justice among employees with various work experiences.Table 7 and as calculated z is smaller than critical value of table at the error level 5% (1.96), based on z Fisher test, there is no difference between correlation relationships between various groups.Table 8, correlation coefficient between job conscience and perceived organizational justice of staffs based on education is significant at the level P≤0.05. Thus, there is a significant association between job conscience and perceived organizational justice among both groups of staffs. As calculated Z is bigger than critical value of table at the error level 5% (1.96), based on z Fischer test, there is difference between correlation relations between two groups and there correlation between job conscience and perceived organizational justice of BA and above Bas staffs is high.Table 9, correlation coefficient between job conscience and perceived organizational justice of staffs based on type of employment is significant at the level P≤0.05. Thus, there is a significant association between job conscience and perceived organizational justice among full employed and temporary employed staffs. As calculated Z is smaller than critical value of table at the error level 5% (1.96), based on z Fischer test, there is no difference between correlation two groups of full employed and temporary employed.

Based on the findings of Table 10, correlation coefficient between job conscience and perceived organizational justice of staffs based on type of employment is significant at the level P≤0.05. Thus, there is an association between job conscience and perceived organizational justice in various work fields.Table 11, as calculated Z is smaller than critical value of table at the error level 5% (1.96), based on z Fischer test, there is no difference between correlations in various work fields.Findings of Table 13 showed that observed f regarding the comparison of justice components in terms of gender, work experience, education, type of employment, work field was not significant at the level P≤0.05 and there is no significant difference between distributive, procedural and interactional justice in terms of gender, work experience, education, type of employment and work field.

DISCUSSION

The researches showed that the conflict in organizations has positive or negative results. The most important disadvantages of conflict are wastage of time and energy of organization, dissatisfaction in organization, reduction of effectiveness of group, forgetting the main goals in organization, misjudgment of people to each other, weakness of coordination and difference between organizational groups. According to the conflict results, there are some losers. Loser people escape from each other and the organization is collapsed instead of being uniform. When conflict is created in an organization, positive outcomes are followed as changes, creativity and innovation development, clarity of issues, goals, views, comments, better and suitable communication and increasing energy in organization, evaluation of abilities and talents of employees, resolution of hidden problems and creating better and constructive views (Labianca et al., 1998).

\Sometimes, the manager should concern about the lack of conflict in organization as the lack of conflict means organization stagnation or it indicates that employees have no motivation for challenge and competition. Thus, the manager should stimulate conflict as positive creation of conflict. Based on conflict management, it can be said conflict is the valuable source of released human energies and the manager attempts for reforming the organization climate to develop the employees and achieve needs and creation of talents actualization (Sorenson et al., 1995).The researches showed that successful managers mostly use collaboration and participatory strategies in conflict management. This style indicates positive use of conflict and using dictatorial styles and avoidance in conflict management has negative effect and it means the lack of using conflict. Compromise styles have various effects.One of the conflict types applied by managers is personality conflict and some solutions should be found to solve them.

Personality conflict is created with the normal stimulations. The recent studies showed that increasing administrative formalities to achieve the results and variety of labor force led to specific conditions in current work environments. Rudeness is turned into a void cycle in these environments and this can lead to violence (Schermerhorn et al., 1994). Thus, managers should try to avoid rudeness void cycle and eliminate it and consider respect culture in organizations among the employees and they should be the model of humbleness and supporting the employees.Conflict management proposes specific strategies for each behavior arising from specific personality. Seven various personality types are investigated among the employees of organizations and conflict management strategies are proposed to avoid interpersonal conflict (Robins, 2001).

The managers of organizations should implement conflict management to reduce inter-group conflicts. One of the required strategies is face to face communication and various groups members experience more (BazazJazayeri, 1998). The first priority of managers to cope with the intergroup conflict is identification and elimination of negative issues among groups. It can be said intragroup conflict and gossips about intermediation are the threats that should be eliminated if the intergroup conflict should be reduced (Strernberg and Soriano, 1976). Various different views and conflict in organizations caused that majority of the time of managers is dedicated to avoiding , reducing and solving these problems (Farhangi, 1999). Researchers found that at high level of organization, conflict management is as important as management duties (Dargahi and Fariborz, 2007). The ability of inhibiting conflict is one of the most important skills, managers need. The studies regarding top and middle management showed that a manager averagely dedicates 20% of his time to dealing the conflicts. In one of the researches, one of the managers was asked to rank 25 effective factors in success. The results showed that conflict coping is important in their success. "Mouziless" believed that most of the researches conducted in organizations are about conflict. He hoped that these researches are useful for organization problem solution. Similarly, Peru found that organizational theories regarding mutual relations of people can be adapted to organizational conflicts.

The results of the study showed that there is a positively significant association between perceived organizational justice and its dimensions (distributive, procedural and interactional justice) and job conscience and constructive conflict at the level $P \leq 0.05$. Among the demographic variables (gender, work experience, education, type of employment and work field) only education level was effective on relationship between perceived organizational justice and job conscience. There was no significant difference between justice components (distributive, procedural and interactional justice) in terms of (gender, work experience, education, type of employment and work field). The job conscience was higher than average and perceived organizational justice and constructive conflict were less than average. Also, it seems that by improving the employees namely the relations between supervisor and subordinate, job conscience is increased. Also, perceived organizational justice had positively significant correlation with five dimensions of civil organizational behavior (altruism, courtesy, conscientiousness, civic virtue, and sportsmanship). It seems that the higher the perception of people of justice in organization, extra role behaviors are more.
Based on organizational justice, employees react to the presence and the lack of organizational justice at work place. It seems that when people think, they are behaved justly, this has important effect on the attitudes and behavior of people and by perceiving justice, and they are motivated to be involved in civic activities that by some behaviors as organizational citizenship behavior increase their participation to improve organization performance. If employees have high justice in rewards distribution and decision making procedures, they show high commitment in their behavior and attitude.

It seems that organizational justice perception creates conscientiousness in a person and this avoids negative behaviors in organization. If people feel there is no discrimination in rewards, decision making procedures and interactions, they are obliged to be committed to organization and this increases conscientiousness morale among people.

CONCLUSION

Conflict has positive and negative effects on performance of people in organizations. Effective use of conflict improves performance and increase health and safety of organization and its ineffective use causes reduction of performance and tension and injustice among the organizations.Efficient and constructive conflict mostly depends upon the organization behavior with conflict. It means that if conflict is controlled effectively and the manager manages it appropriately, it increases the coherence of group or organization members and this creates forces balance among opposite members and they are guided to compromise or organizational changes. These organizational changes solve problems in organization. Determining the constructive conflict is difficult. The studies showed that 50% of employees show defensive reactions when their performances are criticized and unsuccessful people react by defensive organizations (Thomas 1976).Job conscience is one of five personality aspects. Most of the problems are unsolved in organization without job conscience. Job conscience is the basis of organization and it has vital role in completion of all organization aspects including structures, functions, behaviors and performance of organization. The results of the study showed that perceived organizational justice by staffs is lower than average. There was a positively significant association between perceived organizational justice and its dimensions, distributive, procedural and interactional justice with job conscience. To increase distributive justice, the organization should consider difficulty, sensitivity and complexity of work and specialization of a person in regulating the benefits and wage. Responsibility should be given based on people capability. By good labor division, we can reduce work pressure of people and by evaluation of staffs performance based on common goals of employees and organization in terms of specialization, experience education and work and by scientific methods and opportunities and facilities should be provided for organization members. To increase interaction justice, it is necessary to set up adequate training courses to make the supervisors familiar with human abilities (ability of perceiving human resources and respecting human dignity and creating relations with employees based on ethical relations). Supervisors should be encouraged to use organizational justice principles in interaction with the subordinates. Finally, although little conflict is good in organization and it is suitable, as it is valuable source of released energy and managers are obliged to encourage people for minimum contradiction, the managers aim to fulfill organizational goals and increase suitable performance and create healthy climate in organization. Finally, some recommendations are presented for managers for better implementation of conflict management in organizations to make constructive contradiction:

- Contradiction is natural phenomenon in organization
- We should be aware of conflict and its aspects and various methods of its control and solution.
- The condition of conflict should be investigated.
- We should be wise to select conflict management
- We shouldn't let the different views are problematic among the employees and groups.
- We should search various solutions of conflict solution.

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Table 1-Distribution of study population and sample based on deputies

S.No.	Work environment	Number of employees	%	Number of samples
1	Administrative and financial	142	46	74
2	Education	48	15.4	25
3	Research	59	19	31
4	Students	30	9.6	16
5	Others	31	10	16
7	Sum	310	100	162

Table 2- The results of correlation coefficient between perceived organizational justice and its dimensions (independent variable) with job conscience (dependent variable)

Components	Number of samples	Correlation coefficient	Significance level
Organizational justice (total)	157	0.501	0.001
Distributive justice	157	0.318	0.001
Procedural justice	157	0.491	0.001
Interactional justice	157	0.439	0.001

Table 3- Multiple correlation coefficients and multiple correlation square between organizational justice variables and job conscience.

P	F	Adjusted correlation square	Correlation coefficient square	Correlation coefficient	
0.001	49.16	0.236	0.241	0.491	First step
0.001	29.52	0.268	0.277	0.526	Second step

Table 4- Prediction regression of justice components based on job conscience

	Variable	Impact coefficient	Standard coefficient	T	Significance level
First step	Constant	86.04		22.17	0.001
	Procedural	1.42	0.491	7.01	0.001
Second step	Constant	81.31		15.93	0.001
	Procedural	1.03	0.356	4.24	0.001
	Interaction	0.636	0.233	2.78	0.001

Table 5- Correlation coefficient between job conscience and justice based on gender

Correlation coefficient organizational justice					
Job conscience	Gender	R	P	N	Z
	Woman	0.568	0.001	50	0.654
	Man	0.488	0.001	107	

Table 6- Correlation coefficient between job conscience and justice based on work experience

Correlation coefficient organizational justice				
Job conscience	Work experience	R	P	N
	To 10 years	0.571	0.001	58
	10-20 year	0.434	0.001	84
	Above 20 years	0.598	0.001	15

Table 7- Z test: Significance difference between correlation coefficient based on work experience.

Work experience	Z
To 10 years- between 10 to 20 years	1.07
10-20 year- above 20 years	0.7311
To 10 years-more than 20 years	0.134

Table 8- Correlation coefficient between job conscience and justice based on type of education.

		Correlation coefficient organizational justice			
Job conscience	Education	R	P	n	Z
	Diploma and associate	0.480	0.001	59	2.006
	BA and above	0.518	0.001	98	

Table 9- Correlation coefficient between job conscience and justice based on type of employment.

		Correlation coefficient organizational justice			
Job conscience	Type of employment	R	P	n	Z
	Full-employment	0.422	0.001	125	0.308
	Part-time	0.696	0.001	32	

Table 10- Correlation coefficient between job conscience and justice based on work field.

Correlation coefficient organizational justice				
Job conscience	Work field	R	P	n
	Financial and administrative deputy	0.447	0.001	70
	Educational deputy	0.608	0.001	25
	Research deputy	0.414	0.001	31
	Student deputy	0.623	0.001	15
	Others	0.622	0.001	16

Table 11- Z test: Significance difference between correlation coefficient based on work field.

Work field	Z
Financial and administrative deputy-educational deputy	0.933
Financial and administrative deputy-research deputy	0.177
Financial and administrative deputy-student deputy	0.809
Financial and administrative deputy-others	0.8286
Educational deputy-research deputy	0.940
Educational deputy-student deputy	0.073
Educational deputy-Others	0.065
Research deputy-student deputy	0.8486
Research deputy-others	0.8645
Student deputy-others	0.008

Table 12- Distribution of the relations between variables in structural model.

	Impact coefficient	Std.error	T
Procedural - conscience	1.03	0.24	4.26
Interactional - conscience	0.64	0.23	2.79
Interactional-procedural	0.33	.070	4.76
Procedural- distributive	0.57	0.11	5.28
Distributive-interactional	0.91	0.91	8.95

Table 13- Fit indices of model.

RMSEA	P-value	Df	Chi-square	AGFI	GFI
0.000	0.54804	1	0.36	0.99	1

Table 14- The summary of the results of multi- variance analysis, the comparison of the organizational justice components based on demographic factors.

Demographic factors	Justice dimensions	F	P	Impact coefficient	Statistical power
Gender	Distributive	0.547	0.462	0.006	0.113
	Procedural	0.405	0.526	0.007	0.097
	Interactional	0.243	0.623	0.002	0.078
Experience	Distributive	1.43	0.243	0.029	0.301
	Procedural	0.196	0.823	0.004	0.080
	Interactional	0.969	0.383	0.020	0.214
Education	Distributive	0.424	0.655	0.009	0.117
	Procedural	0.759	0.471	0.015	0.176
	Interactional	0.138	0.871	0.003	0.071
Type of employment	Distributive	0.0	0.998	0.00	.050
	Procedural	0.395	0.531	0.004	0.095
	Interactional	0.612	0.436	.006	0.121
Work field	Distributive	0.850	0.518	0.042	0.293
	Procedural	0.636	0.673	0.032	0.223
	Interactional	0.765	0.578	0.038	0.265

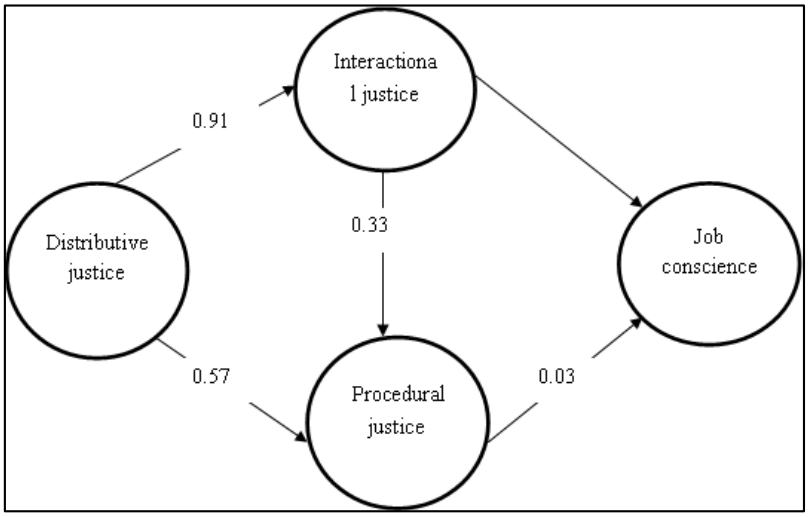

Figure 1- Study causal model based on structural equations modeling of the relationship between organizational justice (distributive, procedural and interactional justice) and job conscience.

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RESEARCH ARTICLE

Modeling of Wireless Environment Monitoring System for an Industrial Zone like Underground Mines.

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ABSTRACT

Wireless sensor network (WSN) have a great impact on different activities in the field of engineering. Uninterrupted self-effacing monitoring of the surrounding working environment can be monitored effectively, efficiently, accurately by the use of wireless sensor network. Safety for workers in an industry is of highest priority. The security for costly equipment is another important objective of any industry. This paper introduced a low-cost, energy efficient, reliable scheme for underground mine purpose. We use different sensors for measurement of different parameters inside underground mines and transmit them to the base station in the control room using ZigBee technology. MATLAB based simulation tools have been used to model and analyze the total system. The proposed system can protect the mine workers as well as equipments inside mines. This work concept can be implemented for other purposes like monitoring the environment of hospitals, multistoried buildings etc.

Key words: - Pollution, Hospitals, Environment, Wireless sensor network (WSN), Safety, ZigBee, MATLAB.

INTRODUCTION

In underground mines the probability of occurrence of disaster is more. The surroundings inside underground mine is a rough, risky and problematic for the working personal. The underground mines are explosive prone zone. Fire inside underground mines is very dangerous as there is no traditional ways for the fire fighter to stop it. It claims loss of property, lives and even sometimes the total evacuation of the nearby locality. An alarming system should be there inside underground mines for forecasting about possible disaster. The monitoring system should transmit precision measuring data urgently to host system corresponding to the disaster occurrence [1]. Once an explosion happens or fire ignites, massive destruction can result with in a very short duration of time. Time here is a very vital factor for forecasting any possible disaster before it actually happens. Pre disaster precaution is very much necessary in this regard. Pre disaster warning includes measurements of different parameters such as concentration of different gases in different types of mines. For ex. inside coal mines different hydrocarbon gases which are very much flammable are present. Gas monitoring systems is one of the important means for prevention gas explosion in coal mines [2].

Establishing reliable communication is a very difficult task for underground mining due to the extreme environmental conditions [3].The communication system should be fast, accurate, reliable, effective and uninterrupted. The problem of installation of devices is tough inside underground mines. The communication system must be uninterrupted between underground mine workers and base station. The communication network must be position independent of the workers moving inside the mines. Due to geographical disadvantages it is very much difficult, expensive and unreliable to set up wired network communication system inside underground mines. For a wide variety of sensor applications, a fixed wired connection between the sensor and the evaluation unit cannot be established [4]. If there is any roof fall inside underground mines total collapse of communication system may occur. Sensor technology acting as an essential part in this case. Wireless sensor network plays vital role inside underground mines. The sensor nodes sense and observe the events in the environment and the more powerful actors collect and process information from the sensor nodes and react to the events [5].

It is extremely hard to reinstall the wired communication network inside underground mines subsequent to a roof fall or damage due to any reason. Because of roof slide, if several personnel trapped within the territory of underground mines, it is essential to retain the continuity of the communication system network. It is also enormously significant to identify the definite point and condition of the trapped personnel. To supervise supplementary parameters all through this situation it is extremely essential to retain the communication system network normal. The network should have some characteristic functions like self-recovery, autonomous operation and effective data transmission in urgent [6].Wireless sensors have the advantage to be free from restrictions imposed by cables; furthermore, sensors may be placed in desirable locations that might otherwise be inaccessible to wired sensors [7]. Mine monitoring system requires huge use of sensors. Advancement on underground mine monitoring system requires accurate identification of temperature, pressure, vibration, flammable and poisonous gases. A Wireless Sensor Network (WSN) is a self-organized, multi-hop wireless network, composed of a large number of sensor motes, deployed over an area of interest [8].

Different protocol can be used for transmission of data. From an application point of view, Bluetooth is intended for a cordless mouse, keyboard, and hands-free headset, UWB is oriented to high-bandwidth multimedia links, ZigBee is designed for reliable wirelessly networked monitoring and control networks, while Wi-Fi is directed at computer-to-computer connections as an extension or substitution of cabled networks [9].ZigBee is a low rate, low power consumption wireless communication technology, which can be widely used in the wireless sensor network (WSN)[10]. However the specification was on hand publicly in 2005, scientists, researchers prefer to use this protocol for its many unique advantages. For the effectively, efficiently, continuously, wireless data transmission, in this work the ZigBee protocol is preferred. The low power ZigBee based network system transmits the information gained from different sensors about different parameters like temperature, humidity, levels of different toxic gases etc.

METHODOLOGY

Proposed Wireless Monitoring System

A wireless communication is burning requirement today for rapid, precise & flexible safety for mine workers. It can detect surrounding temperature, pressure, flammable, toxic gases, tracking of underground miners, vehicles and other accessories on real-time basis. MEMS based sensors are used for monitoring, measurement of data though digital wireless communication technique, which is having high accuracy. Microcontroller is used for collecting, processing, manipulating data and making decisions as per the algorithm set by the concerned department, based on which mine workers is informed through alarm and voice system.An agent-based wireless local positioning system with ZigBee technology is proposed, mainly for factory level applications[11]. An economical, reliable, accurate ZigBee-based wireless technology for underground mines with warning on different toxic and inflammable gases with change in concentration, change in temperature, humidity, pressure inside is projected in this system. This article is based on the advancement of a scheme integrated to a ZigBee specification. ZigBee specification is incorporated by many manufacturing industry for their products due to its low power utilization and economical development cost. It offers full wireless mesh networking capable of supporting more than 64,000 devices on a single network [12].The system has real-time continuous monitor the underground environment by using a variety of sensors and wireless sensor network. The block diagram of system is shown in Figure 1.

Ultra- low power and low cost wireless sensor network consists of coordinator, router and end-devices. ZigBee network requires at least one full function device as a network coordinator, but endpoint devices may be reduced functionality devices to reduce system cost. Coordinator is the main responsible part in the wireless sensor network and it is also responsible for network access and dynamic address assignment. On the one hand, it receives instructions from server computer for network setting and data packets, and alarm indication sends it to surface server system. Perhaps the most straightforward way to think of the ZigBee routing algorithm is as a hierarchical routing strategy with table-driven optimizations applied where possible. A wireless sensor network(WSNs) are typically low data rate, low latency and self-organizing is a randomly spaced array of nodes that provide three functions; the ability to monitor physical and environmental conditions; and the ability to provide efficient, reliable communications. Prototype of wireless sensor network creates by number of motes as shown in Figure 2.Self-organizing networks allow new nodes to join the network automatically, without the need for manual intervention, and are capable of dynamic self-healing; reconfiguring link associations to form alternative pathways around failed or powered-down nodes. The network usually includes a gateway node which bridges the WSAN to upstream networks and user applications

RESULTS

MATLAB SIMULATION

The function of each sensor networks is described with characteristics in MATLAB/simulation model we use FIGARO USA INC sensors mostly from TGS series sensors for our experimental set ups.

Pressure Sensor Model

Schematic diagram of pressure sensor modeling and result is shown in Figure 3 and Figure 3a respectively .In pressure sensor model, if surrounding pressure increases above a particular value or if surrounding pressure decreases below a particular value a signal generates. We utilized this signal to generate a particular type of alarm sound and a particular colour of light glows. The MATLAB simulation of the circuit network is shown here. . The signal information from the field will be transmitted to the base station.

CO Sensor Modeling

Schematic diagram of CO sensor modeling and result is shown in Figure.4 and Figure.4a respectively. This sensor is used to detect concentration of carbon monoxide (CO) in the ambient temperature. Little fluctuation of the concentration of CO gas leads to change in the resistivity of the sensing element. This change is converted into pulsed voltage by a pulse generator. We utilize this signal to generate a particular type of alarm sound and a particular colour of light glows. The MATLAB simulation of the circuit network is shown here. The signal information from the field will be transmitted to the base station using ZIGBEE technology.

Methane Sensor Modeling

Schematic diagram of the methane gas sensor modeling and result is shown in Figure 5 and Figure 5a respectively. It is used to detect both carbon monoxide (CO) as well as methane gas. The principal is same as other gas sensors. Changes in the concentration of both gases lead to changes in the resistivity of the sensor element. That property is utilized to vary a voltage source. Suitable calibration method and measurement gives us the information about the concentration of both the gases. We utilized this signal to generate a particular type of alarm sound and a particular colour of light glows. The MATLAB simulation of the circuit network is shown here.

CO_2 Gas Sensor Modeling

Schematic diagram of CO_2 Gas sensor modeling and result is shown in Figure 6 and Figure 6a respectively .This sensor is used to measure concentration of carbon di oxoide (CO_2) gas in the sorrounding atmosphere.This sensor maintains a linear relationship between changes in concentration of carbon di oxoide (CO_2) gas and changes in voltage in lograthmic scale .This is shown in the MATLAB/SIMULINK model.

H_2S Gas Sensor Modeling

Schematic diagram of H_2S gas sensor modeling and result is shown in Figure 7 and Figure 7a respectively. If the Hydrogen sulphide gas (H_2S) concentration changes, the temperature of the surrounding changes which actually increases the conductivity of the sensor resistance i,e the sensor resistance increases. The Voltage drop across the load resistance (output voltage) increases, suitable calibration method gives us the information about changes in the gas concentration of Hydrogen sulphide gas (H_2S) .In our MATLAB simulation the output graph shows the characteristics of the sensor. The signal generates a particular type of alarm sound and a particular colour of light glows. The MATLAB simulation of the circuit network is shown here.

Thermal Sensor Modeling

Schematic diagram of temperature sensor modeling and result is shown in Figure 8 and Figure 8a respectively. In Temperature sensor SIMULINK model, if the temperature goes above a particular value or if the temperature falls below a particular level a signal generates. We utilized this signal to generate a particular type of alarm sound and a particular colour of light glows. The signal information from the field will be transmitted to the base station using the proposed scheme.

CONCLUSION

Conventional mine security structure can be successfully replaced by the surveillance and safety system projected in the paper. A larger region and additional depth within risky underground mines are currently can be roofed and probable accidents can be controlled successfully. The system combined the low power; low cost Zigbee based wireless data transmission machinery with modern age small size sensors. The sensor and zigbee module can be preferably installed over the helmet of mine worker. Suitable monitoring and dialogue is promising among the employees and the ground personnel who can help to take suitable actions more quickly and smartly. The scheme too can be effortlessly extended with ZigBee wireless representation transmission facility in future; it will advance scalability of underground environment and expand exact position of miners. This work can be implemented in other places like hospitals, multistoried buildings with necessary modification. Monitoring of environment of shopping malls, commercial places, domestic areas can be monitored using this concept with modifications as per geographical locations. This work concept can be used for industry for security purposes. In industry where chemical gases may produce this work concept will be very helpful. This work can be implemented to any city where pollution is more as an environment monitoring system.

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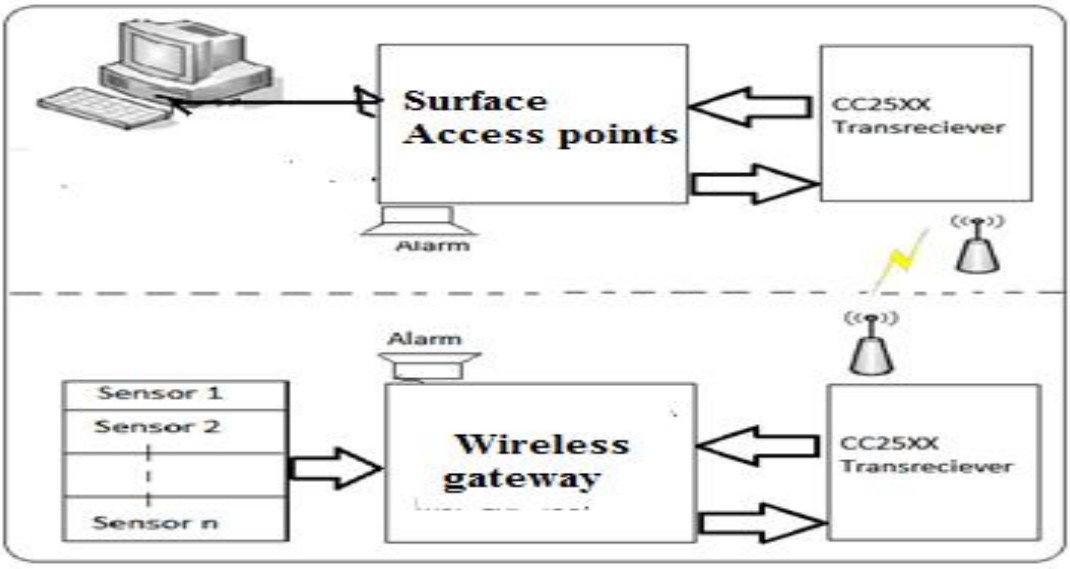

Figure 1. Overall block diagram for the proposed system

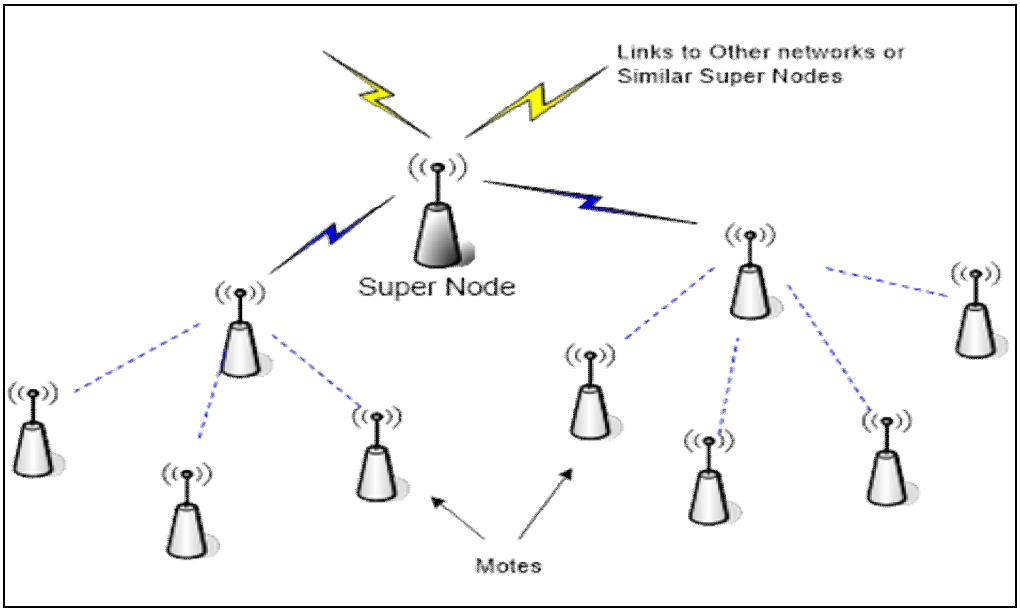

Figure 2. Prototype of wireless sensor network

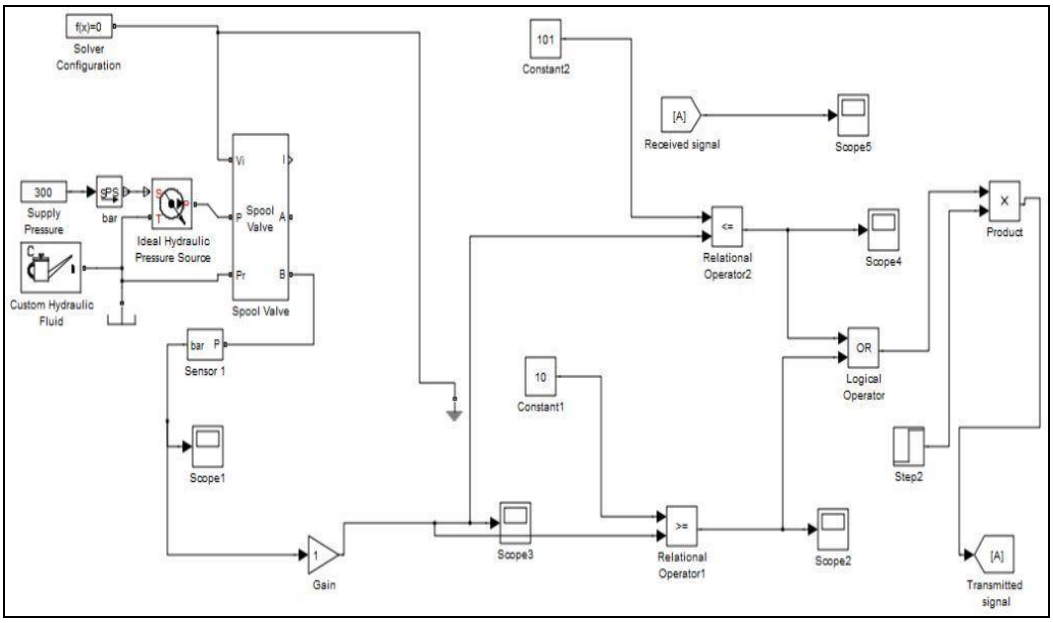

Figure 3. Schematic diagram of pressure sensor modeling using matlab/simulink

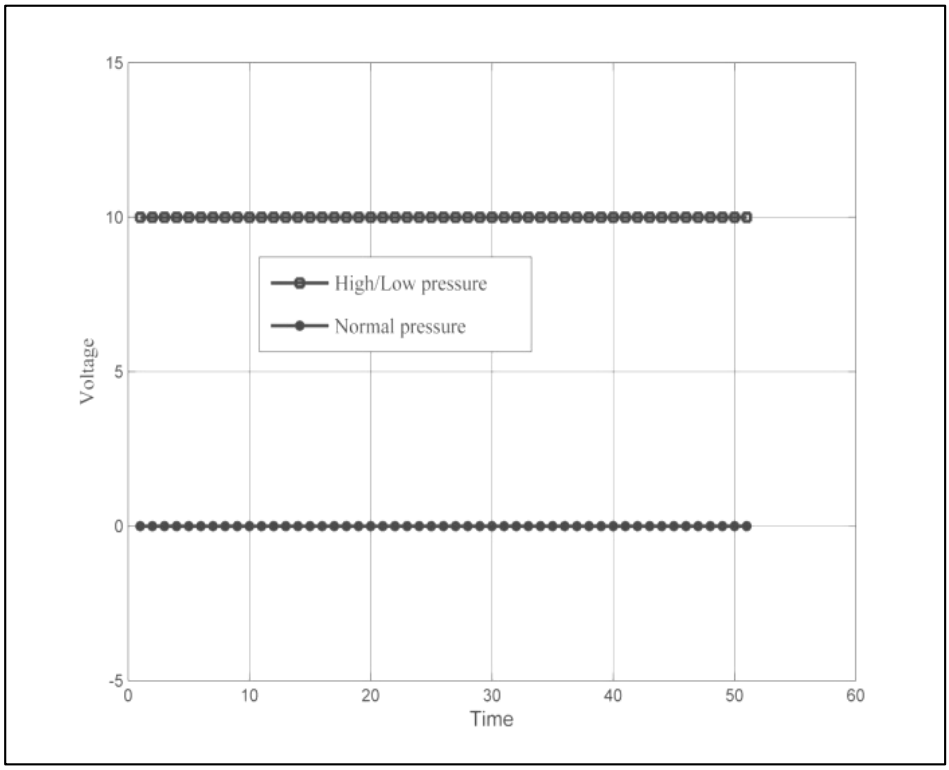

Figure 3a.Plotting of voltage vs time for pressure sensor

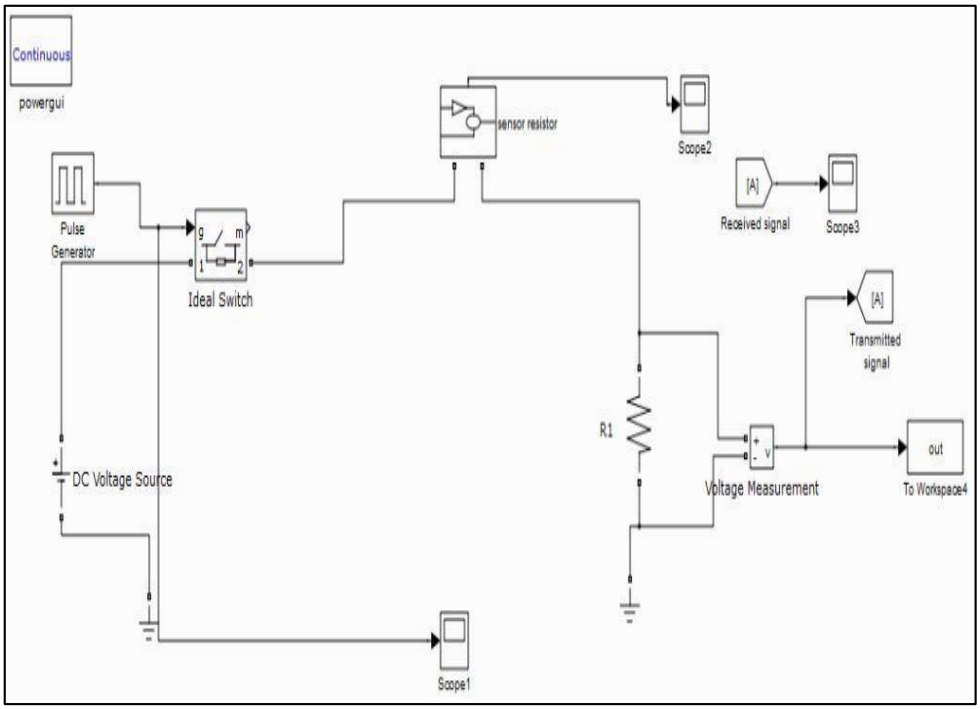

Figure 4. Schematic diagram of CO sensor modeling using matlab/simulink

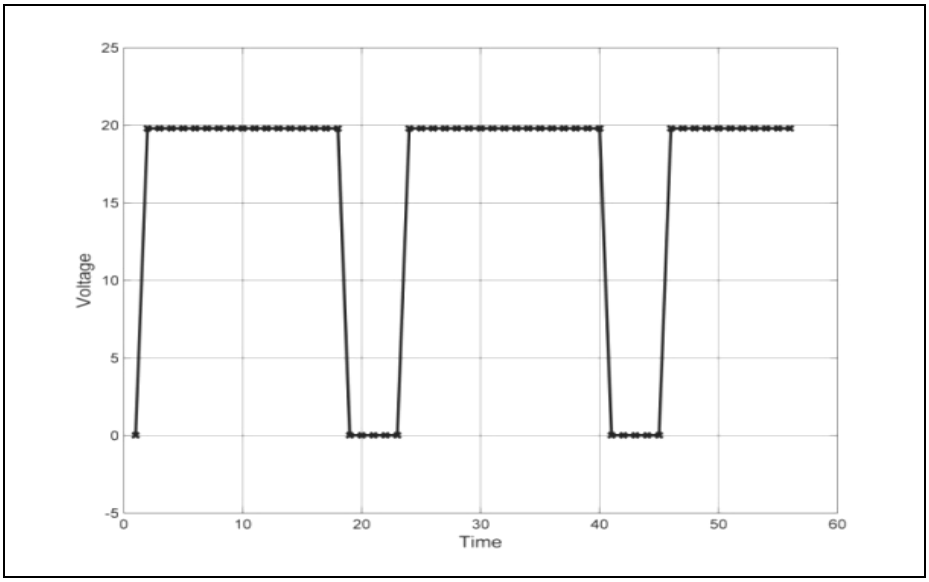

Figure 4a. Plotting of voltage vs time for CO sensor

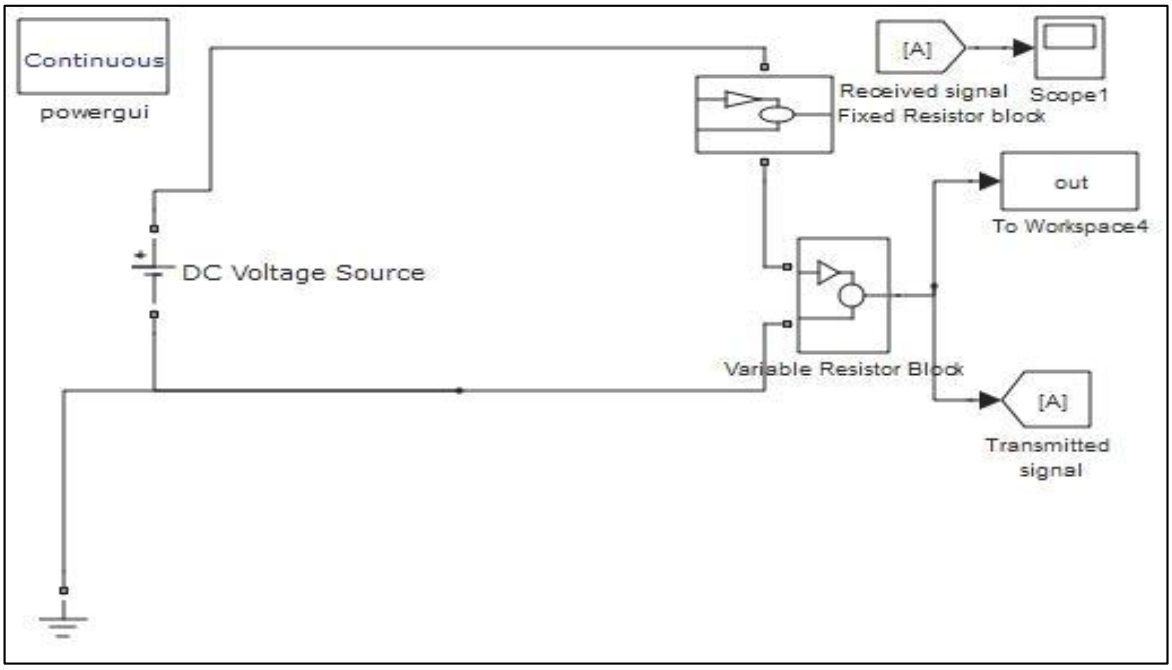

Figure 5. Schematic diagram of methane sensor modeling using matlab/simulink

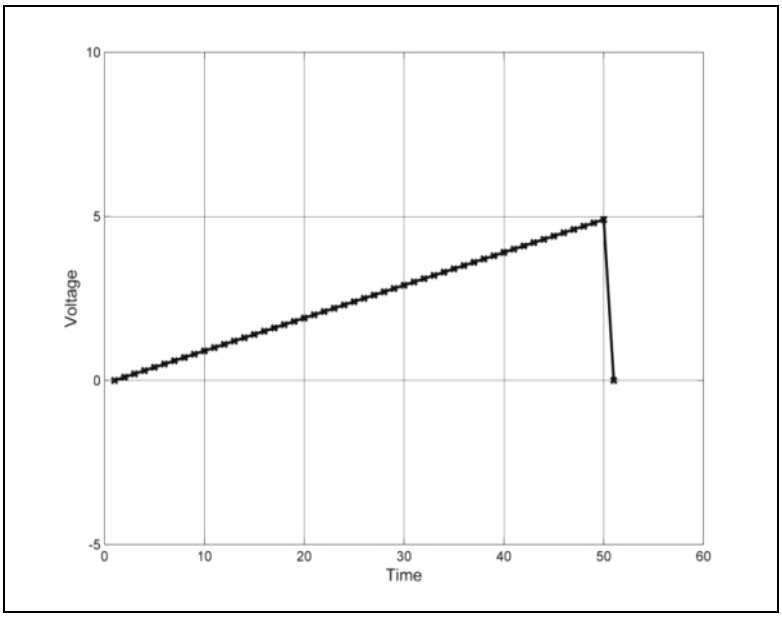

Figure 5a. Plotting of voltage vs time for methane gas sensor

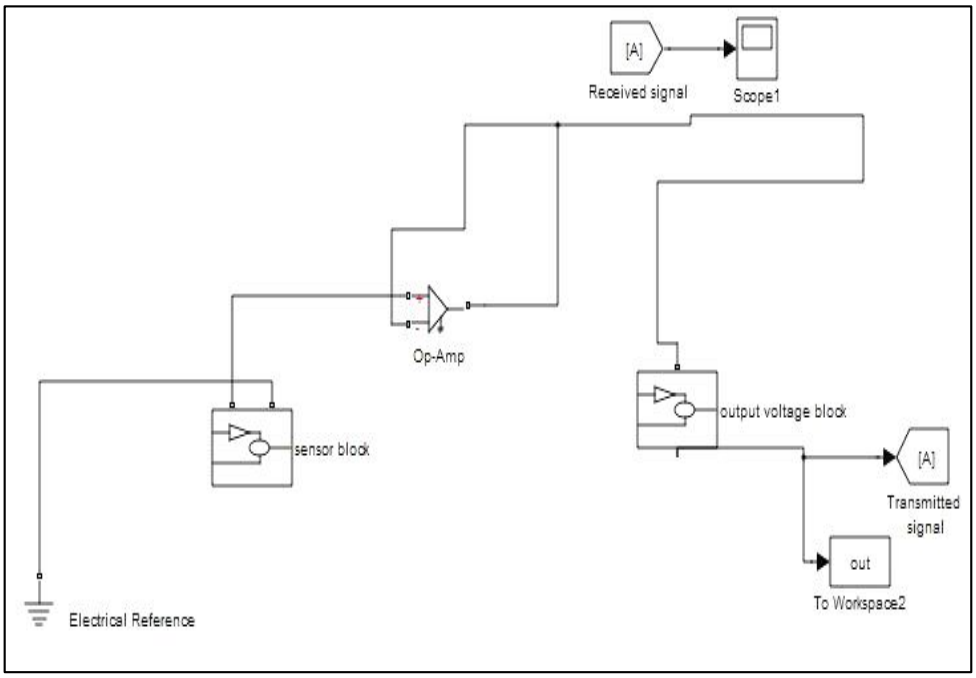

Figure 6. Schematic diagram of CO_2 Gas sensor modeling using matlab/simulink

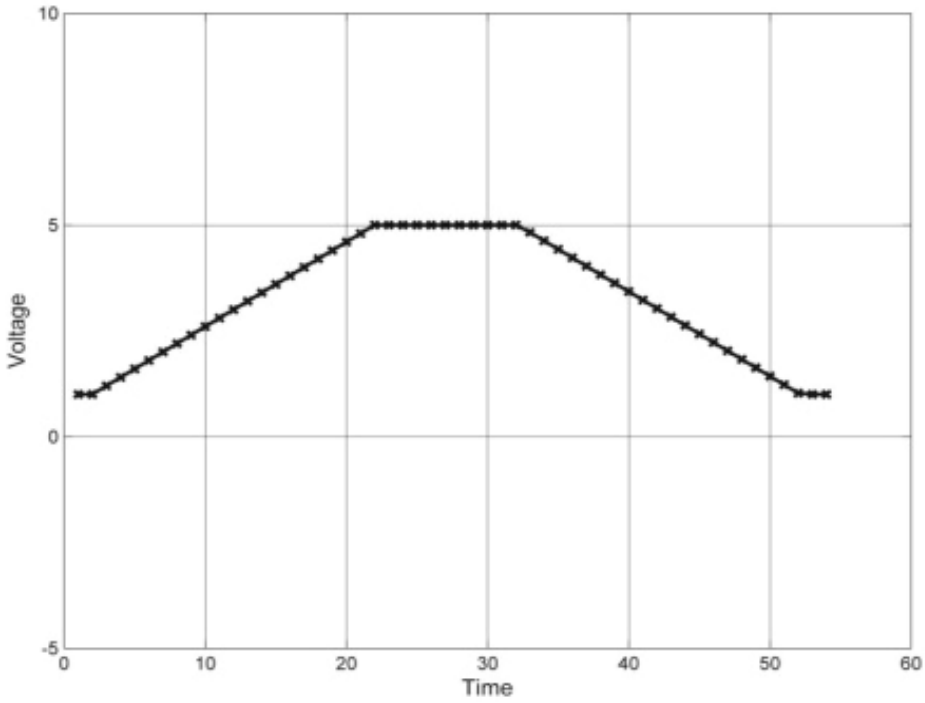

Figure 6a. Plotting of voltage vs time for CO_2 Gas sensor

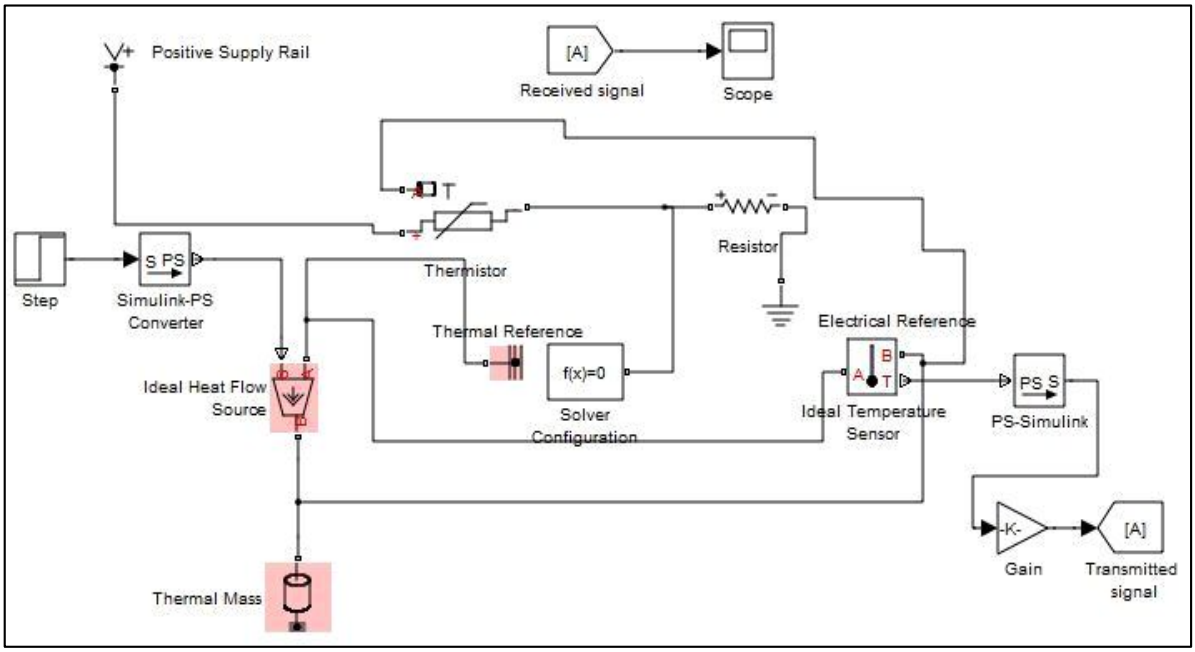

Figure 7. schematic diagram of H_2S gas sensor modeling using matlab/simulink

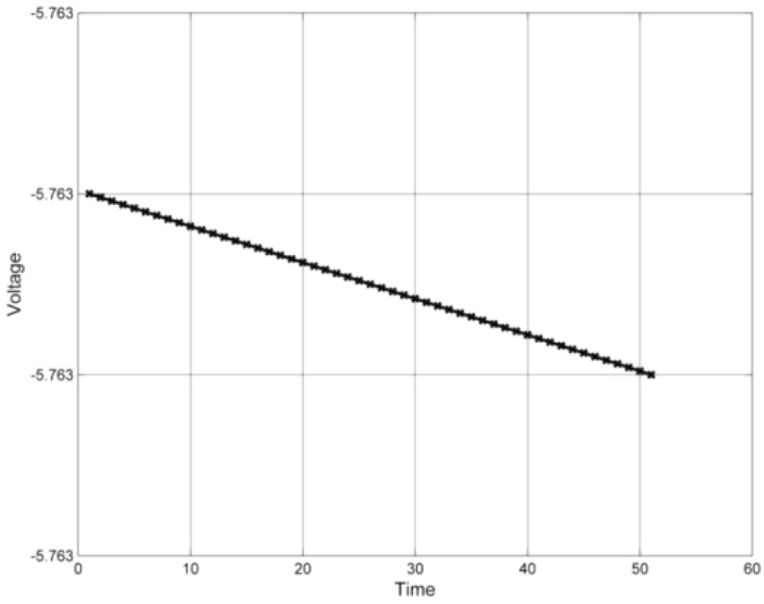

Figure 7a. Plotting of voltage vs time for H_2S gas sensor

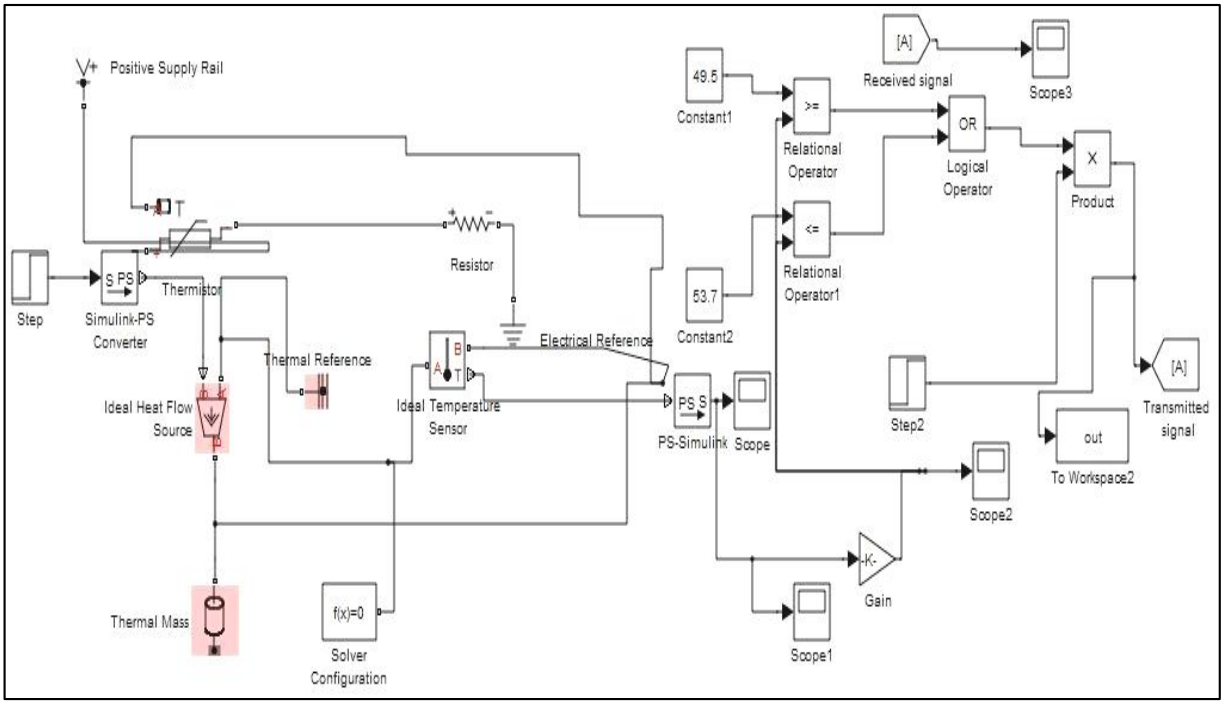

Figure 8. Schematic diagram of temperature sensor modeling using matlab/simulink

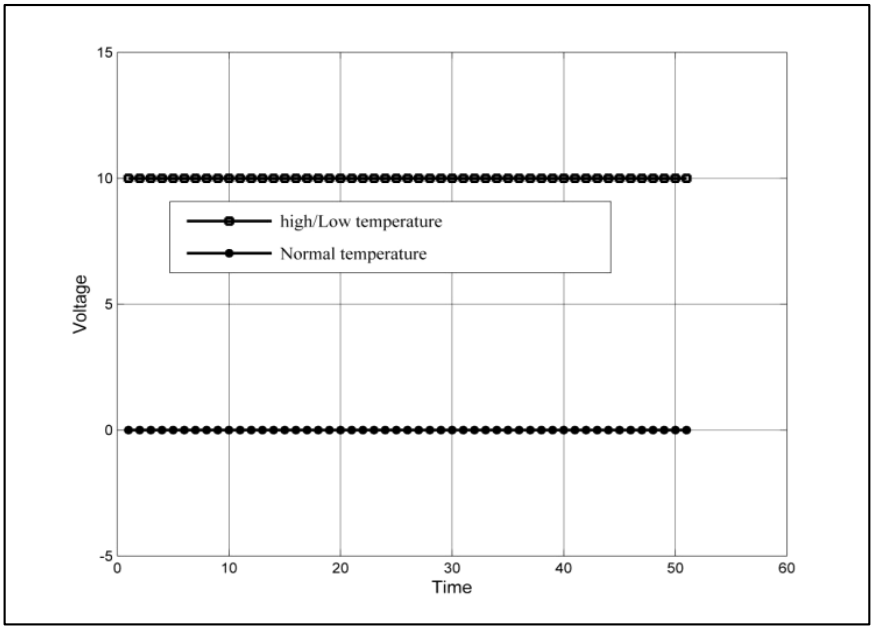

Figure 8a.Plotting of voltage vs time for temperature sensor

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REVIEW ARTICLE

Green Banking and Environmental Risk Management.

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ABSTRACT

In a globalised economy, the industries and firms are vulnerable to stringent environmental policies, severe law suits or consumer boycotts. Since banking sector is one of the major stake holders in the Industrial sector, it can find itself faced with credit risk and liability risks. Further, environmental impact might affect the quality of assets and also rate of return of banks in the long-run. Thus the banks should go green and play a pro-active role to take environmental and ecological aspects as part of their lending principle, which would force industries to go for mandated investment for environmental management, use of appropriate technologies and management systems.

Keywords: Green banking, Green finance, Environment Risk, Environment Risk Management and Online Banking etc.

INTRODUCTION

Sustainable development can best be achieved by allowing markets to work within an appropriate framework of cost efficient regulations and economic instruments. One of the major economic agents influencing overall industrial activity and economic growth is the financial institutions such as banking sector. In a globalised economy, the industries and firms are vulnerable to stringent environmental policies, severe law suits or consumer boycotts. Since banking sector is one of the major stake holders in the Industrial sector, it can find itself faced with credit risk and liability risks. Further, environmental impact might affect the quality of assets and also rate of return of banks in the

long-run. Thus the banks should go green and play a pro-active role to take environmental and ecological aspects as part of their lending principle, which would force industries to go for mandated investment for environmental management, use of appropriate technologies and management systems. Sustainable development has emerged as a new paradigm of development in response to the current discourse of development that over-exploits natural environment for economic prosperity. The sustainable development can best be achieved by allowing markets to work within an appropriate framework of cost efficient regulations and economic instruments. One of the major economic agents influencing overall industrial activity and economic growth is the financial institutions such as banking sector. The banking sector influences the economic growth and development in terms of both quality and quantity, there by changing the nature of economic growth. Banking sector is one of the major sources of financing investment for commercial projects which is one of the most important economic activities for economic growth. Therefore, banking sector can play a crucial role in promoting environmentally sustainable and socially responsible investment (SRI).

Atiur Rahman (2010) focused on the present monetary and credit policy of Bangladesh Bank towards attaining broader financial enclosure. Bangladesh Bank is carry forwarding with technology driven, innovative, environment and low cost banking approach; conveying a qualitative change in banking, preparation of monetary policy, application of advanced banking technology, and use of Information and Communication Technology (ICT) to extend financial services to the door step of common people. To ensure access to financial services for all, various initiatives have been taken like trade finance; digitalization of the financial sector; channeling liquidity into productive and supply augmenting investments including agriculture, SMEs, Green Banking and CSR activities; expected to lead to more broad -based inclusive growth and therefore lessen poverty; required for pushing the country on course to the targeted vision of digital Bangladesh by 2021; the year of Golden Jubilee of their independence.

Suresh Chandra Bihari (2011) elucidated that Green Banking includes promoting corporate social responsibility (CSR). It starts with the aim of protecting the environment where banks consider before financing a project whether it is environment friendly and has any implications for the future. A company will be given a loan only when all the environmental safety standards are followed. Green Banking can be efficiently implemented through the use of technology and policy, he emphasized.

Alice Mani (2011) indicated that as Socially Responsible Corporate Citizens (SRCC), banks have a major role and responsibility in enhancement of governmental efforts towards substantial reduction in carbon emission. Banks can practices and initiatives of Green Banking for sustainable development. The author examined and compared the green lending policies by banks in India in the light of their compliance and commitment to environment protection and environment friendly projects. Green Banking Policy of BASIC Bank Limited, Bangladesh (2011) was go forwarded in response to increasing consciousness over climate change, environmental degradation, need for urgent measures for sustainable development to be addressed by some of the stakeholders in the world. Banking system holds a unique position in an economy that can affect production, business and other economic activities through their procedure for financing activities which would in turn contribute to protect environment/climate from pollution. Moreover, efficiency in energy use, water consumption and waste reduction may significantly contribute for operating cost for many of the large banks of the country. Green Banking is also significant issue in recent times. While the banking industry is undergoing computerization, networking and offering of on-line banking is naturally gaining momentum [Mohmed Aminul Islam (2010)].

Green Banking

The word „Green Banking" is very common concept in the world. Global warming is a great issue in protection of hygienic society. There is high possibility of playing significant role of Green Banking in the global warming issue. The green banking concept is evolved in western countries and now is practiced in most of the countries in the world. It indicates endorsing environment-friendly practices and reducing carbon footprint from banking activities. Green

banking is not just another corporate social responsibility activity; it is all about going beyond to keep the world livable without any significant damage. Green banking that considers all the social and environmental factors is also called ethical banking. The main objective of green Banking is to ensure the use of organizational resources in favor of the environment and society. Green banking as a concept is proactive and smart way of thinking with a vision for future sustainability of our only Spaceship earth - as design science explorer Richard Buckminster Fuller called our Earth. It evaluates all the factors before giving the loan whether the project is environment-friendly and has any implication on the future people and planet. Green finance as a branch of green banking makes significant contribution to the transition to resource efficient and low carbon industries i.e green industry and green economy in general. Green banking is a component of the global initiative by a group of stakeholders to put aside environment. Green banking or ethically responsible banks do not only advance their own initiatives but also affect socially responsible behavior of other business. Green Banking defined as promoting environmental-friendly practices and reducing your carbon footprint from your banking activities. Green banking thus involves a two pronged approach. Firstly, green banking focuses on the green transformation of internal operations of all banks. It means all the banks should adopt appropriate ways of utilizing renewable energy, automation and other measures to minimize carbon footprint from banking activities. Secondly, all banks should adopt environmentally responsible financing; weighting up environmental risks of project, before making financing decisions; and in particular supporting and fostering growth of upcoming „green" initiatives and projects. Generally Green banking coverage includes: Sustainable banking, Ethical banking, Green mortgages, Green loans, Green credit cards, Green savings accounts, Green checking accounts, Green money market accounts, Mobile banking, online banking, Remote deposit, Waste Management, Roof Gardening, and Green Financing.

Importance of Green Banking

Until recently, environmental concerns were not considered relevant to the business operation of banks and financial institutions. Traditionally, banking sector's concern for environmentally degrading activities of clients is like interfering or meddling in their business affairs. However, now it is being perceived that dealing with environment brings risks to their business. Although the banking and financial institutions are not directly affected by the environmental degradation, there are indirect costs to banks. Due to strict environmental disciplines imposed by the competent authorities across the countries, the industries would have to follow certain standards to run their business. In the case of failure, it would lead to closure of the industries leading to a likelihood of default to the bank. In the recent years several countries (more in Europe) are seen adopting policies that have made banks responsible for the misdeeds of their clients. Therefore, the financial institutions need to engage proactively with the stakeholders on environmental and social policy issues and evaluate the impacts of their client's investment. In turn, that would force the customers to take care of their management of environmental and social policy issues relating to investment. This should cover all project financing activities across all industries. The importance of Green Banking is immense for both the banks and economy by avoiding the following risks involved in banking sector.

Objectives of the Green Banks

The broad objective of the green banks are avoiding waste and giving priority to environment and society. Focusing on environment-friendly initiatives by providing innovative financial and ensure sustainable development.

- Using organizational resources with responsibility.
- Keeping the world livable for a long period of time.
- To minimize paper works as much as possible inside and outside the bank.
- To achieve cost and time efficiency.

Green Banking Strategies

The adoption of green banking strategies will help the bank to deal with these risks involved in their business operation. Green banking strategies involves two components (1) managing environment risk and (2) identifying

opportunities for innovative environmentally oriented financial products (IFC, 2007). To manage environmental risk, the banks have to design proper environmental management systems to evaluate the risks involved in the investment projects. The risks can be internalized by introducing differential interest rates and other techniques. Moreover, bank can withdraw itself from financing high-risk projects. The second component of green banking entails creating financial products and services that support commercial development with environmental benefits. These includes investment in renewable energy projects, biodiversity conservation, energy efficiency, investment in cleaner production process and technologies, bonds and mutual funds meant for environmental investments etc. Thus, the banking and financial institutions should prepare an environmental risk and liability guidelines on development of protective policies and reporting for each project they finance or invest (Jeucken, 2001). They can also have an environmental assessment requirement for the projects seeking finance. Banks also can issue Environmental hazards management procedures for the each project and follow through. International financial institutions like International Financial Corporation (IFC), Japan Bank for International Cooperation (JBIC) have incorporated environmental management into their business operation. All project proposals are classified in terms of its potential environmental impact taking into account factors such as the sector and scale of the project, the substance, proposed project site, the degree and uncertainty of its potential environmental impact. Often, the World Bank's loans and grants are associated with certain level of commitment of the beneficiary countries to adopt environmental protection measures.

The perception towards complying with environmentally norms and standards is changing over time. Adhering to environmental norms and standards were considered costly and as a bottleneck to development. If we will consider the economic benefits of these in terms of health care, productivity and insurance then the benefit is much higher than the cost. A study confirms that only air pollution causes the loss of 200 million working days and the resulting losses in productivity and medical expenses costs around 14 billion pound to the European Union **(Stavros Dimas, 2005).** If all the impacts of environmental degradation are considered and costs are measured, then we can find the huge economic benefits these protection measures bring in. Environmental friendly technologies also make economic sense for the industries and actually lessen the financial burden. The cost of pollution is rising with more awareness about these issues all over the world. The polluting industries face more resistance and often forced to closedown or face massive boycott by the consumers. This adds to their cost enormously. Environmental concerns are integrated into the international trade policy and often act as trade barrier for environmentally sensitive goods (ESGs). So adopting environmentally sustainable technologies or modes of production is no more considered as a financial burden, rather it brings new business opportunities and higher profit. Green banking saves costs, minimizes the risk, enhance banks reputations and contribute to the common good of environmental sustainability. So it serves both the commercial objective of the bank as well as its social responsibility. Green banking solves the problem faced by the environmental regulation and enforcements authorities related to size and location of the polluting unit. The authorities have practical limitations on enforcing environment standard on small-scale industries and also industries located in far off places.

Environment Management

Now a day, most of the commercial lending process in different parts of the world scrutinizes projects with a set of tools by incorporating environmental concerns in their day-today business. The financial institutions should encourage projects which take care of following points while financing them viz.
(a) Sustainable development and use of natural renewable natural resources.
(b) Protection of human health, bio-diversity, occupational health and safety, efficient production, delivery and use of energy.
(c) Pollution prevention and waste minimization, pollution controls (liquid effluents and air emissions) and solid and chemical waste management.
(d) There should be a third party expert to draw a plan for the environment management plan.
Strategy of reuse, recycling of materials and equipments, and source reduction and waste minimization strategy should be part of in-house environmental management. Banks are increasingly relying on virtual meeting through the use of video conferencing in lieu of physical travel which would help saving cost and energy.

Environmental Risk

Environmental risk means the risk of causing pollution or destruction of the natural environment (land, water, air. natural habitats, animals and plant species), either through accidental or deliberate actions. Environmental risk is not a part of credit risk; rather it is a facilitating element of credit risk when it is linked with the credit risk due to environmental condition/climate change. Incorporation of environmental risk is required to be incorporated in the Core Risk Management (CRM) that mandates considering Environment in the overall credit risk methodology.

Environmental Risk Management

The overall purpose of Environmental Risk Management is to understand and manage risk that arises from environmental concerns. This brings a focus on planning and implementing policies and procedures to mitigate environmental risks. The specific purposes are to:

- Examine the environmental issues and concerns associated with potential business activities proposed for financing
- Identify, evaluate and manage the environmental risk and the associated financial implications arising from these issues and concerns
- Enhance the credit/investment risk appraisal process

The following approaches have been used to enhance environmental risk management:

- Banks should be able to ascertain risks arising out of environmental issues
- The practice should be directed towards addressing the focused environmental problem that is causing the risks. It should not be used as a tool to solve problems in general
- The practice needs to be value adding to the customer and should not be policing in nature. Bank will work with the potential customers in a collaborative manner. Together, they should plan the business activity that will adequately address the environmental risk.
- Bank will use Environmental Risk Management to strengthen the relationship with the customer and not to create unease.
- Environmental Risk Management will focus on managing risks and not on avoiding risks. This intended for inculcating responsible financing practices and not for discouraging/ reducing financing. However, if there are business activities that are inherently irresponsible and managing these risks are not feasible, the Bank will avoid financing.

Environmental Impact of Banks

Banking sector is generally considered as environmental friendly in terms of emissions and pollutions. Internal environmental impact of the banking sector such as use of energy, paper and water are relatively low and clean. Environmental impact of banks is not physically related to their banking activities but with the customer's activities. Therefore, environmental impact of bank's external activity is huge though difficult to estimate. Moreover, environment management in the banking business is like risk management. It increases the enterprise value and lowers loss ratio as higher quality loan portfolio results in higher earnings. Thus, encouraging environmentally responsible investments and prudent lending should be one of the responsibilities of the banking sector. Further, those industries which have already become green and those, which are making serious attempts to grow green, should be accorded priority to lending by the banks. This method of finance can be called as "*Green Banking*", an effort by the banks to make the industries grow green and in the process restore the natural environment. This concept of "Green Banking" will be mutually beneficial to the banks, industries and the economy. Not only "Green Banking" will ensure the greening of the industries but it will also facilitate in improving the asset quality of the banks. Environment is no longer the exclusive concern of the government and the direct polluters, but also the other partners and stake- holders in the business like financial institutions such as banking institutions can play a very important role in fostering linkage between economic development and environmental protection. To substantiate,

quality of service, the implementation of environmental conservation measures, support to the deprived section of the society, concern about the quality of life and nature are the basic principles that the financial institutions are relying on in their business strategy in recent years.

Environmental Performance of Banks

The banking operation targets a certain long-term rate of return on their credit and investment. However, there is every credit extension, investment caries the risk of non-payment and reduction of value (in case of direct investment) due to environmental liabilities. Therefore, it is of importance to the banking sector to follow certain environmental evaluation of the projects before financing. There are studies showing positive correlation between environmental performance and financial performance (Hamilton, 1995; Hart, 1995; Blacconiere and Pattern, 1993). Thus, it is imperative for the financial institutions in the present context to consider environmental performance in deciding whether to invest in companies or advise clients to do so. The formation of different rules for environmental management like resource conservation, clean water act, clean air act, toxic substance control act are also viewed as potentially significant contributor to the recent increase in environmental liability for banking institutions. Adoption of these principles will offer significant benefits to financial institutions, to consumers and also the stakeholders. There have been attempts to adopt sustainable development strategies from various quarters at international level4. Multilateral agencies, international consortiums, multilateral financial and development institutions have been advocating for environmental standards and strategies to evaluate investment projects. In the recent years, the international organization for standardization (ISO) has issued series of comprehensive guidelines for incorporating environmental protection and pollution prevention objectives into industrial activity worldwide, known collectively as ISO 14000. It would certainly give the much needed impetus for the banking industry to expand the use of environmental information in their credit extension and investment decisions.

Green Banking Activities

A) Internal Operations & Environment

- Much conservative in use of fuel, electricity, paper and even water
- Ensure maximum efficiency while using resources
- Try to avoid printing and print both sides of paper if needed.
- Reusing envelop, scrap papers as notepad, folders, paper clips etc. and avoid the use of disposable cups, plate etc.
- Use of e-mails instead of paper correspondence
- Use of energy saving bulbs instead of normal ones and less fuel consumption cars
- Try to use of day light and air circulation

B) Online Banking

Online banking is a green banking. Bank is giving more emphasis to make the easiest way to help environment by eliminating paper waste, saving gas and carbon emission, reducing printing costs and postage expenses. Meantime all the branches of the Bank have included under the system of online banking. wide range of online banking operations including:SMS banking,Internet banking,Centralized foreign trade processing system (all types of L/C issues, bills issue & Payment, remittance, message generation & conversion, SWIFT etc.) ,Automated Cheque Processing System (BACPS),Alternative delivery channels (e.g. debit card, remittance card, pre-paid card, travelers Card etc.),Mobile banking,Online Data Center,Disaster Recovery Site ,Central MIS system, etc

C)Other Activities under Green banking includes

Sustainable banking, Ethical banking, Green mortgages, Green loans, Green credit cards, Green savings accounts Green checking accounts,Green CDs,Green money market accounts,Remote deposit (RDC)

Banks' in House Green Activities

- Use of papers on both sides for internal consumption
- Introduction of e- statement for customers in lieu of paper statement.
- Use of online communications in the best possible manner.
- Using more daylight instead of electric lights and proper ventilations in lieu of using air conditioning.
- Using energy saving bulbs.
- Video /audio conferencing in lieu of physical travel.
- Conversion of bank‟s vehicles into CNG and use of energy efficient electronic equipments.
- Efficient use of printer cartridges, photocopy toner, office stationary etc.
- Sharing electronic files, voice mail, and e-mail instead of paper memos.
- Common use of table stationeries instead of individual use.

CONCLUSION

In a rapidly changing market economy where globalization of markets has intensified the competition, the industries and firms are vulnerable to stringent public policies, severe law suits or consumer boycotts. This would affect the banks and financial institutions to recover their return from investment. Thus, the banks should play a pro-active role to take environmental and ecological aspects as part of their lending principle which would force industries to go for mandated investment for environmental management, use of appropriate technologies and management systems. Green banking saves costs, minimizes the risk, enhance banks reputations and contribute to the common good of environmental sustainability. So it serves both the commercial objective of the bank as well as its social responsibility. Green banking solves the problem faced by the environmental regulation and enforcements authorities related to size and location of the polluting unit. The authorities have practical limitations on enforcing environment standard on small-scale industries and also industries located in far off places. Thus, the banking and financial institutions should prepare an environmental risk and liability guidelines on development of protective policies and reporting for each project they finance or invest (Jeucken, 2001). They can also have an environmental assessment requirement for the projects seeking finance.

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RESEARCH ARTICLE

Land Use / Land Cover Classification of Theni District, Tamil Nadu, India using Remote Sensing and GIS Techniques.

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ABSTRACT

The land use/land cover detail of Theni District which is located in the western part of Tamil Nadu (India) is studied in this article. The study has made use of satellite imagery to identify the land use/land cover status of the study area. The software like ERDAS and ArcGIS are used to demarcate the land use/land cover features of Theni District. Remote sensing and GIS provide consistent and accurate base line information than many of the conventional surveys employed for such a task. The total area of Theni District is 2,889 sq.km. The land use/land cover classes of the study area has been categorized into five such as built-up land, agricultural land, forest, waste lands and waterbodies on the basis of NRSA classifications. Among these categories, agriculture land is predominantly found all over the study area, it is occupied about 1,600.5 sq.km (55.4 per cent), followed by forest land with 1,028.2 sq.km (35.6 per cent), waste lands sharing about 222.8 sq.km (7.7 per cent), water bodies occupied with 29.8 sq.km (1.0 per cent) and at last the built-up land with an area of 7.7 sq.km (0.3 per cent).

Keywords: Land use / Land cover, False Colour Composite, Remote Sensing, IRS.

INTRODUCTION

A modern nation, as a modern business, must have adequate information on many complex interrelated aspects of its activities in order to make decisions. Land use is the only one such aspect, but knowledge about land use and land cover has become increasingly important as the nation plans to overcome the problems of haphazard, uncontrolled development, deteriorating environmental quality, loss of prime agricultural lands, destruction of important wetlands, and loss of fish and wildlife habitat. Land use data are needed in the analysis of environmental processes and problems that must be understood if living conditions and standards are to be improved or maintained at current levels. Land use refers to man's activities and the varied uses which are carried on over the land and land cover refers to natural vegetation, water bodies, rock/soil, artificial cover and others noticed on the land [1]. Land cover, defined as the assemblage of biotic and abiotic components on the earth's surface is one of the most crucial properties of the earth system. Land cover is that which covers the surface of the earth and land use describes how the land cover is modified. Land cover includes: water, snow, grassland, forest, and bare soil. Land use includes agricultural land, built-up land, recreation area, wildlife management area, etc.

Human activities are transforming the surface of the Earth at an accelerated pace. Such disturbance of the land can affect local, regional, and global climate by changing the energy balance on the Earth's surface and the chemical composition of the atmosphere [2] [3] [4]. Over the past decades, land use/land cover has been widely recognized as a critical factor mediating socioeconomic, political and cultural behaviour and global climate change [5] [6] [7]. Over the years, remote sensing has been used for land use/land cover mapping in different parts of India [8] [9] [10] [11]. Application of remotely sensed data made possible to study the changes in land cover in less time, at low cost and with better accuracy. Remote sensing and Geographic Information System (GIS) provide efficient methods for analysis of land use issues and tools for land use planning and modeling.

Research like this, on how such human factors interact in driving land use will improve projection of land use/land cover and our comprehension of human responses to environmental changes [12]. Land use and land cover changes leading to degradation and have impact on the global carbon cycle and as such this can add or remove carbon dioxide from the atmosphere, contributing to climate changes, which can lead to global warming. It is well established that land cover change has significant effects on basic processes including biogeochemical cycling and thereby on global warming [13], the erosion of soils and thereby on sustainable land use [14], and for at least the next 100 years is likely to be the most significant variable impacting on biodiversity [15].

Over the past decades, land use/cover has been widely recognized as a critical factor mediating socioeconomic, political and cultural behavior and global climate change [5] [6] [7]. The land changes, commonly referred to as urban sprawl, associated with rapid expansion of low density suburbs into formerly rural areas and creation of exurbs, urban or suburban areas buffered from others by undeveloped land, have ramifications for the environmental and socioeconomic sustainability of communities.

Land cover change has been described as the most significant regional anthropogenic disturbance to the environment [16]. In essence, both land use and cover changes are products of prevailing interacting natural and anthropogenic processes by human activities. Land use and land cover change and land degradation are therefore driven by the same set of proximate and underlying factor elements central to environmental processes, change and management through their influence on biodiversity, heat and moisture budgets, trace gas emissions, carbon cycling, livelihoods and a widerange of socio-economic and ecological processes [17] [18] [19] [20]. Landuse is a product of interactions between a society's cultural background, state, and its physical needs on the one hand, and the natural potential of land on the other [21]. The present study describes the various land use/land cover changes and categories of the study area.

Study Area

Theni District is located in the western part of Tamil Nadu state in South India. The District lies between 9º39' - 10º30' North latitude and 77º00' - 78º30' East longitudes (Figure 1). The District covers a total geographical area of about 2,889 sq.km. The district is bounded by Dindigul District in the north, Madurai District in the east, Virudhunagar District in the southwest and Idukki District of the Kerala State in the western part. In the plains, the temperatures range from a minimum of 13°C to a maximum of 39.5°C. In the hills the temperature can range from 4-5°C to 25°C. The district is known for its salubrious climate, hills and lakes. The Vaigai River, Kottagudi River, Suruliyar River, Varaganathi River, Manjalar River and Varattaru River flow through the District. The important reservoirs in the district are Vaigai Dam, Manjalaru Dam, Sothuparai Dam, Sanmughanathi Dam, Manalaru Dam and Melmanalaru Dam.

Cumbum Valley is a major centre for grape production with 4,000 small farmers producing over 90,000 tonnes of Muscat grapes, locally known as *panneerdhrakshai*, and about 10,000 tonnes of Thomson seedless grapes. The unique feature here is that the grapes are harvested throughout the year, while in most grape growing centres elsewhere the season ends with summer. The Periyar and Surliar Hydro Power Stations and the Vaigai Micro Hydro Power Station have 181 MW installed capacity and actual power generation of 494 MW in 1996 in this District. Theni is one of the active business hubs in the western side of Tamil Nadu, inviting more industries to its locality.

METHODOLOGY

The land use / land cover categories of the study area were mapped using IRS 1D LISS III data (FCC of bands 2, 3 and 4) using ERDAS 9.0. The satellite data was digitally interpreted and after making thorough field check, the map was finalized using ArcGIS 9.1. The various land use / land cover classes were interpreted further.

RESULTS AND DISCUSSION

Five categories of land use / land cover classes were identified by this study. The land use classes in the study area include built-up land, agricultural land (kharif land, rabi land, double/triple, current land and plantation/orchard), forest (evergreen forest, deciduous forest and scrub/degraded forest), waste land (grass land, other waste land and scrub land) and water bodies (river, stream, lake, reservoir, tank and canal). Detailed accounts of these land use / land cover classes of the study area are described in the following section (Figure 2).

Built-up Lands

The built-up lands are the areas of human inhabitation, developed due to non-agricultural activities like building, industries and transportation network. It includes educational, health and socio-economic facilities like: games/sport viewing centres and shops, etc. In the satellite image these features are identified with their dark bluish green tone in the centre and bluish tone on the periphery. These features have a coarse texture. In the study area, well developed settlements are identified in Periyakulam, Theni, Andipatti, Uthampalayam and Bodinayakanur. Many smaller settlements also found in the study area. The total area covered by the major and minor settlements in the study area constitutes 7.7 sq.km (0.3 per cent) of the study area (Table 1).

Agricultural Lands

Agricultural lands include the land used to raise food crops and plantation crops. These are the lands mainly used for farming and for production of food, horticultural crops and other commercial. With the help of satellite data, it is possible to identify the different types of agricultural lands up to level - III. The various categories of the agricultural

lands identified in the study area are described below in detail. These include the agricultural areas identified by their characteristic red tone; regular shaped agricultural fields and in associated with settlements, water bodies, etc. Crop lands are well distributed throughout the foot hills zones, along the river side and plain regions of the study area.

Kharif Land

The kharif crops (paddy, groundnut and sugarcane) are cultivated in the months of June, July and August. It is interested to note that such crops are totally distributed in the central part, northern part and southeastern part of the study area. These kharif crops occupy 49.8 sq.km (1.7 per cent) of the study area.

Rabi Land

The rabi crops mostly (paddy, cholam, cumbu and maize) are cultivated in the months of October, November and December. These crops found in plain regions, along the river side and near to the water bodies. The crops cultivated during rabi season are distributed all over the study area. These crops occupy about 492.4 sq.km (17.0 per cent) of the total study area.

Double / Triple Crops

The double / triple crops are another classification of the agricultural land. These lands are found in the central, northern and southern parts of the study area. The total area under this category is about 713 sq.km (24.7 per cent).

Fallow Land

The land remains vacant and without crops is called fallow land. These were identified by their dark greenish tone, smaller size, regular shape and medium texture. These lands are distributed in the central part, northeastern and southwestern parts of the study area. This type of land occupies with the total area of 328.8 sq.km (11.4 per cent).

Agricultural Plantations

The plantation crops include cashew nuts, coconut trees, etc. Such areas were found in dark red colour tone. In the study area, such fallow lands are found in the northwestern part. The plantation crop occupies about 0.6 per cent of the agricultural land with an area of 16.4 sq.km.

Forest lands

The forest area in Theni district is about 35.6 %. There are 27 forest areas in Theni District constituting a total area of 1,028.2 sq.km. In this, 19% of area fall under the Reserved Forest category with 548.9 sq.km, 8% of area is under reserved land category with 231.1 sq.km. Dense and sparse forests are found with an area of 292.81 sq.km and 22.43 sq.km respectively. About 44.65 sq.km of manmade forest area are cultivated in the District. Wattle, softwood, fuel wood, cashew, neem and tamarind are the main forest plantation species in Theni District. Forest, comprise of thick and dense canopy of all trees. These lands are discerned by their red to red tone and varying in size. They show irregular shape and smooth texture. In the satellite image, such forests are identified by yellow tone with smooth texture. Based on the tonal and textural variations, the forests of the study area are divided in to three categories, evergreen forest, deciduous forest and scrub/degraded forest.

Evergreen forest

This forest is found in the Myladumparai block, eastern part of Andipatti block and western part of the Bodinayakanur block. The area occupied by this forest is about 384.2 sq.km (13.3 per cent) of the total study area. Such kind of forest is found, where the average annual rainfall is more.

Deciduous forest

Deciduous forest characteristic was found with dark red tone, smooth texture and irregular shaped on thesatellite images. In the study area, such deciduous forest areas are found in the Myladumpari block, south, east and western part of Cumbum block, western part of Uttamapalayam block, western and northern part of Bodinayakanur block and northern part of Periyakulam block. The forest is found confined to the higher and medium altitudinal areas. The forest of this category occupies an area of 617.3 sq.km (21.4 per cent).

Scrub/Degraded forest

This forest type is a relative concentration of scrubs, bushes and smaller trees are predominant while taller trees are limited in areal extent. These forests are found in lower altitudes of the hill area and found associated with other forests. These types of forest found in the southern part of Cumbum block, northern part of Myladumpari block, central and northern parts of Bodinayakanur block and northern part of Periyakulam block. This forest share is recorded about 26.7 sq.km (0.9 per cent) of the total study area.

Waste lands

Land, which does not support any vegetation are known as waste lands. Rocky, salt affected land, land with and without scrub, sandy area, sheet rocks, mining, stony, active depositional features and stony regions include in this category. Such lands are formed due to the chemical and physical properties of soil, temperature, rainfall and local environmental conditions. In the study area there are three categories of waste lands, which could be easily identified from the image. These are grass land, other waste land and scrub land.

Other waste land

These waste land categories occupied with an area of 104.4 sq.km (3.6 per cent) in the total study area. These lands are found in association with higher topography. These areas are identified in the satellite images from its light yellowish tone and it is associate with higher altitudes. The absence of vegetation distinguishes this category from the earlier described class.These types of the waste lands are found in the central and northeastern parts of the study area, particularly Uttamapalayam, Cinnamanur, Theni, Peryakulam and Andipatti blocks.

Scrub land

These scrub land occupies 118.4 sq.km (4.1 per cent) of the total area. Such areas are identified from their yellowish tone and their association with uplands, and their irregular shapes. These lands are subjected to degradation or erosion and consist mainly of thorny bushes. These types of land found in all over the study and north eastern part of the Bodinayakanur block occupies large amount of scrub land compare than other blocks.

Water bodies

The water bodies share about 29.8 sq.km (1.0 per cent) of the total study area. The water bodies including rivers, streams, lakes, tanks and reservoirs. The deep water features appear in black tone in the satellite imagery. The

shallow and deep water features appear in light blue to dark blue in colour. Vaigai River, Kottagudi River, Suruliyar River, Varaganathi River, Manjalar River and Varattaru River flow through the District. The important reservoirs in the District are Vaigai Dam, Manjalaru Dam, Sothuparai Dam, Sanmughanathi Dam, Manalaru Dam and Melmanalaru Dam. The numerous major and minor tanks, lakes and canals are identified. The lakes are found in the south and northeastern part of the Periyakulam block, central part of the Andipatti block, central part of the Theni and Cinnamanur blocks and southern part of the Bodinayakanur block.

CONCLUSION

The study mainly focused on the land use/land cover classification and its types. The Indian Remote Sensing Satellite (IRS) data, image processing and Geographic Information System techniques were used to identify the land use categories such as built-up lands, agricultural lands, forests, waste lands and water bodies. The agricultural land was predominant in the present study with more than fifty per cent of lands fall under the agriculture purpose. Most of people are engaged in agricultural activities. The agriculture land includes kharif crop land, rabi crop land, double/triple crop land, current fallow land and plantation/orchard. The forest lands including evergreen, deciduous and scrub/degraded types are the second dominant land use type found in the study area. Waste land, which does not support any vegetation are known as waste lands. Rocky, salt affected land, land with and without scrub, sandy area, sheet rocks, mining, stony, active depositional features and stony regions include in this category. Such lands are formed due to the chemical and physical properties of soil, temperature, rainfall and local environmental conditions. In the study area, there are three categories of waste lands, which could be easily identified from the image. The water bodies share about one per cent of the total study area. The water bodies include rivers, streams, lakes, tanks and reservoirs. The deep water features appeared in black tone in the satellite imagery. The shallow water and deep water features identified in light blue to dark blue in colour. Vaigai River, Kottagudi River, Suruliyar River, Varaganathi River, Manjalar River and Varattaru River flow through the district. The important reservoirs in the district are Vaigai Dam, Manjalaru Dam, Sothuparai Dam, Sanmughanathi Dam, Manalaru Dam and Melmanalaru Dams are located in this district. The numerous major and minor tanks, lakes and canals are identified. The lakes are found in the south and northeastern parts of the Periyakulam block, central part of the Andipatti block, central part of the Theni and Cinnamanur blocks and southern part of the Bodinayakanur block.

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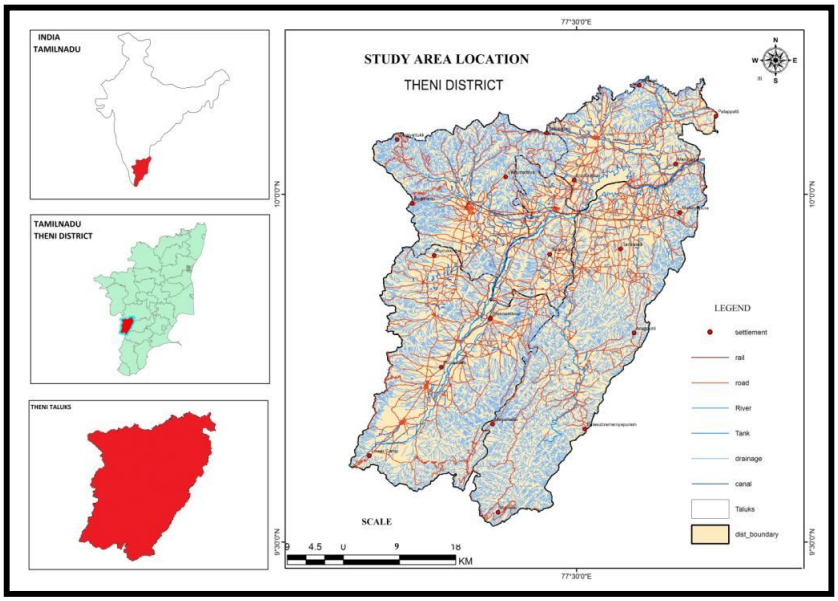

Figure 1: Study Area – Theni District, TamilNadu State, India.

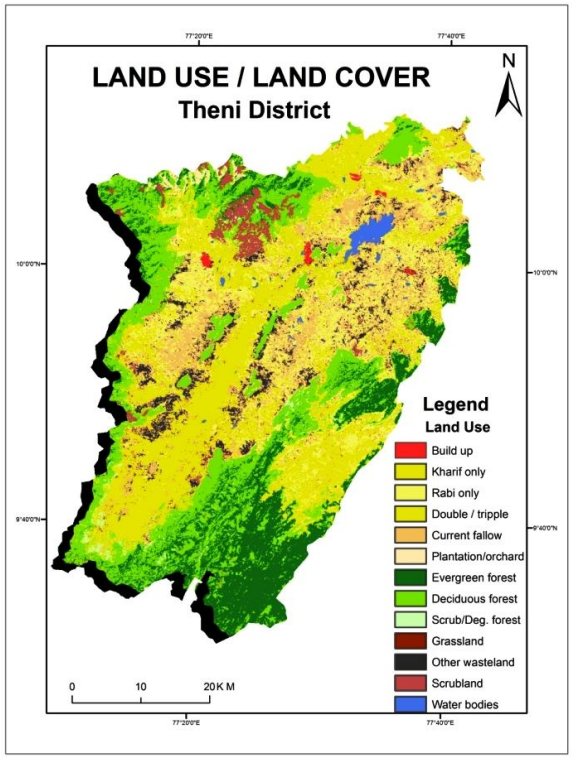

Figure 2: Land Use / Land Cover Classes of Theni District, TamilNadu, India.

Table. 1- Land Use and Land Cover Classification of Theni District.

S. No.	Level - I	Level - II	Area in Percentage	Area in sq.km
1	Built-up Land	Built-up Land	7.7	0.3
2	Agriculture Land	Kharif only	49.8	1.7
		Rabi only	492.4	17.0
		Double/Triple	713.0	24.7
		Current Fallow	328.8	11.4
		Plantation/Orchard	16.4	0.6
3	Forest Lands	Ever Green Forest	384.2	13.3
		Deciduous Forest	617.3	21.4
		Scrub/ Degraded Forest	26.7	0.9
4	Waste Lands	Grass Lands	0.1	0.0
		Other Waste Lands	104.4	3.6
		Scrub Lands	118.4	4.1
5	Water Bodies	River/stream/Lake/Reservoir/ Tank/Canal	29.8	1.0
Total			**100**	**2889**

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RESEARCH ARTICLE

Relationship of Emotional Intelligence and Quality of Working Life among the Employees of Physical Education Organization.

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ABSTRACT

Emotional capabilities and merits are the determining and influential factors on quality of social relationships as they leave prominent effects on controlling of feelings, emotions and thoughts which leads to an increase in quality of working life. Thus, the purpose of this research is to study the relationship of emotional intelligence and quality of working life among the employees of physical education organization. Participants of research were 305 persons from the employees of physical education organization departments in three Northern provinces of the country that had separately been selected through available sampling. Instrumentation included a questionnaire on personal particulars, Shering's emotional intelligence questionnaire and Walton's quality of working life questionnaire. Kendall's correlation coefficient was used to analyze the data at α<0.05 significance level. The results suggested that there exists a significant relationship between emotional intelligence and quality of working life and its components (fair pay, safe workplace, secure growth, individual rights, social solidarity, work and lifestyle, social ties of working life, development of human capabilities) such that increase in emotional intelligence leads to higher quality of working life and its components. Quality of working life as a means of people's approach towards their jobs affects their performance and productivity within an organization, therefore it may increase the emotional intelligence through correct planning in the workplace and provision of training situations so that the employees may become sufficient in terms of controlling of feelings, emotions and thoughts while emotional intelligence is one of the most influential mental constructs for increase in quality of working life.

Keywords: Emotional intelligence, fair pay, safe workplace, secure growth, individual rights, social solidarity, social ties of working life, development of human capabilities.

INTRODUCTION

The existentialist philosophy of an organization relies on life of human beings. Humans are the most precious treasure and resource for organizations as they shape organizational decisions, propose solutions and ultimately resolve the problems, enhance the productivity and give meaning to efficiency and influence. So, work carried out through human resources has an important place in survival and enhancement of an organization and the role of humans as a key and strategic figure in the life of organizations is more highlighted and in case the organizations are concerned with concerns human resources development and achievement of stable competitive advantage in the market, then it is necessary for them to satisfy the spiritual and material needs of their employees.

The concept of quality of working life was introduced in the 1980s which refers to the approach of people toward their jobs i.e. the extent to which mutual trust, care, gratitude, interesting task and appropriate opportunities for investments are provided for the employees in the workplace. The degree of quality of working life within an organization may be estimated through measurement of satisfaction, absence and motivation among employees.In recent years, working life plans have played an important and crucial role in increase of human resources productivity and efficiency of organizations and large corporate since the quality of working life or the quality of work system is one of the most interesting methods of stimulation and an important solution in design and enrichment of jobs which originates from the approach of employees and directors toward motivation. Quality of working life is an expansive work schedule that increases employees' satisfaction, boosts their learning in the workplace and assists them in management of changes and evolutions. Dissatisfaction of employees with quality of working life is a problem which nearly hurts all the employees regardless of their positions. The purpose of many organizations is to increase employees' satisfaction at all levels but this is a complicated situation since it is difficult to determine and discern the relevant features of quality of working life. Study of quality of working life and its relevant variables among the employees of various organizations is of high significance in improvement and enhancement of organizational productivity.

External factors (salary and wages) and internal factors (internal rewards) and the orientation toward the job (priority of internal or external rewards being dependent on personnel) may be regarded as factors having impact on quality of working life with each of these factors discussed as the most important influential factors on quality of working life through a different perspective (scientific management, humanitarian approach, orientation toward job while the three perspectives are unanimous in terms of relevance of personnel performance with quality of working life but it should be noted that a variety of mental constructs apart from external factors may be discussed as the influential internal factors affecting the quality of working life.

It seems that emotional intelligence is one of the most important influential mental constructs in this area. In other words, the emotional intelligence of employees, as one feature of their characteristic, may be a decisive factor in their compatibility with organizational conditions and variables and may be considered as their working stimulant. In fact, the emotional intelligence is a type of intelligence consisting of recognition of self-emotions and their application for adoption of appropriate decisions in life. Moreover, the emotional intelligence may be a factor used for anger and stress management and control while it may serve as a motive, hope and optimism in encountering the hindrances to achievement of objectives. Correct application of emotions (self-regulated emotions) is the ability that relies on self-consciousness as it refers to a person's capacity to solace himself and repel anxiety, depression and common boredom. Self-motivation, self-control, delays in immediate satisfaction of demands and desires, guidance of emotions and the ability to be placed in a desirable mental situation.

The importance of emotional intelligence is more revealed when it is considered an evolved form of attention to mankind within organizations and a modern tool in the hands of directors to steer the personnel inside or outside organizations. One of the reasons of discussing the emotional intelligence as a variable related to quality of working life comes from the belief that emotional intelligence as opposed to the traditional concept of intelligence is a better

predictor of social accomplishments and people with higher emotional intelligence enjoy better social skills, long-term relationships and more ability to solve disputes.

In spite of the possibility of such a relationship existing, the research literature on this issue seems limited but even the few works done in this area have suggested a significant correlation between emotional intelligence and quality of working life. For instance, Ahmadnejad et al. (2012) showed in a study that there is a significant relationship between the emotional intelligence and quality of working life of official tutors and their tuition fees while Farahbakhsh (2012) in a research called "the role of emotional intelligence in increase of quality of working life among the school principals" concluded that there exists a positive correlation between emotional intelligence and quality of working life. Venetta et al. (2005) showed that emotional intelligence has a positive relationship with educational improvement, life satisfaction and lower behavioral disruptions while in another study they suggested that the emotional intelligence has significant and positive relationships with the indices of life satisfaction, life quality and positive relationship with others.

Since the Ministry of Sports and Youth is the supreme authority in charge of the issues related to youngsters and sports in Iran, it is obliged with development of a comprehensive national plan for organization of youth affairs with respect to roles and essential missions of public and private sectors institutes while taking into account the cultural, social, political, vocational, academic, recreational and educational needs of youngsters and this calls for capable human resources within the organization. Thus, it is necessary to study the influential factors on quality of working life of employees as it would theoretically strengthen self-sufficiency and improves social and personal relationships while practically speaking, it may increase the productivity of employees such that the financial problems of company may be resolved or compensated.

So, the objective of this research is to study the relationship of emotional intelligence and quality of working life and its micro-scales (sufficient and fair pay, safe and hygienic workplace, social ties of working life, continuous growth, legal positivism in labor organization, human resources development, consistent security and social integrity and solidarity) among the employees of physical education organization departments in three Northern provinces of Golestan, Gilan and Mazandaran.

METHODOLOGY

This is a correlative-descriptive research wherein the data have been collected in the field. The statistical population of research consists of the entire employees of physical education organization from the three Northern provinces of Iran as 305 of them were separately selected as samples through available sampling technique and questionnaires were distributed among all of them and the entire handed in questionnaires were deemed applicable. Research instrumentation included a questionnaire on personal particulars, Shering's emotional intelligence questionnaire and Walton's quality of working life questionnaire. Personal particulars questionnaire: Developed by the researcher, this questionnaire would yield data such as age, gender, qualifications and work experience of employees. Shering's emotional intelligence questionnaire: a 33 question test based on 5-point Likert scale whereby the components of emotional intelligence are estimated. These components are: consciousness, self-regulation, self-stimulation, communion and social skills as the emotional intelligence is the total score gained from these components. This scale was normalized by Mansouri (2001) in Iran.

Walton's quality of working life questionnaire (1973): this one consists of 16 questions drafted based on the 5-point Likert scale as it measures the quality of working life in eight dimensions (sufficient and fair pay, safe and hygienic workplace, social ties of working life, continuous growth, legal positivism in labor organization, human resources development, consistent security and social integrity and solidarity). Walton reported a reliability coefficient of 0.88 for this test. Validity and reliability of this questionnaire in Iran have been verified by another research.

To determine the initial reliability, the research questionnaire was first distributed among 10 university professors and experts in this area as their comments were applied to the final edition while a pilot test was conducted on a 30-person selected sample to determine the validity of questionnaire whereby 0.91 and 0.88 Cronbach's alpha coefficients were respectively derived for the emotional intelligence and quality of working life which verified the internal consistency of questionnaires. Due to the nature of the research, descriptive statistics was used to describe, classify and derive raw scores through calculation of mean values, standard deviations and plotting of diagrams while the Kolmogorov-Smirnov normality tests was used in the inferential statistics and Kendall correlation coefficient was applied to test the hypotheses. Statistical software SPSS v.21 was used to analyze the data. A significance level of α<0.05 was considered for the entire hypotheses.

RESULTS

Demographic features included: gender (70 female and 235 male), age (120 people below than 30, 125 people between 30 and 40, 60 people beyond 40), education (35 people with high school diploma, 40 people with associate degree, 195 people with bachelor degree and 35 people with master degree) and work experience (100 people with less than 5 years, 106 people between 6 and 10 years, 99 people with more than 10 years).Kolomogorov-Smirnov test (Table 1) was used to assess the normality of data whereby the normality of data was rejected (significance less than 0.05).

1. Results suggested a significant relationship between fair pay and emotional intelligence of employees (0.43 Kendall correlation coefficient). (p<0.05).
2. Results suggested a significant relationship between safe workplace and emotional intelligence of employees (0.41 Kendall correlation coefficient). (p<0.05).
3. Results suggested a significant relationship between secure growth and emotional intelligence of employees (0.48 Kendall correlation coefficient). (p<0.05).
4. Results suggested a significant relationship between individual rights and emotional intelligence of employees (0.52 Kendall correlation coefficient). (p<0.05).
5. Results suggested a significant relationship between social solidarity and emotional intelligence of employees (0.46 Kendall correlation coefficient). (p<0.05).
6. Results suggested a significant relationship between lifestyle and emotional intelligence of employees (0.48 Kendall correlation coefficient). (p<0.05).
7. Results suggested a significant relationship between social ties of working life and emotional intelligence of employees (0.53 Kendall correlation coefficient). (p<0.05).
8. Results suggested a significant relationship between human resources development and emotional intelligence of employees (0.42 Kendall correlation coefficient). (p<0.05).

Finally, the results between emotional intelligence and quality of working life among employees is significant (0.58 Kendall correlation coefficient) (p<0.05).

DISCUSSION

study of research variable and results suggested a positive significant relationship between emotional intelligence and quality of working life and its eight micro-scales (fair pay, safe workplace, secure growth, individual rights, social solidarity, work and lifestyle, social ties of working life, development of human capabilities) i.e. the quality of working life and its components increases per increase in emotional intelligence of employees. These findings are in line with findings of Yousefi & Safari (2009), Hosseinan et al. (2010), Ahmadnejad et al. (2012), Venetta et al .(2005) and Farahbakhsh (2012) especially in case of relationship between emotional intelligence and quality of working life. The results also show that higher emotional intelligence of employees and personnel along with positive approach to work would lead to satisfaction with life and quality of working life. Fair pay consists of equal wages for identical

tasks and proportionality of payments with criteria set by employees. Accordingly, no identical wage should be allocated for different tasks, therefore the must be a fair salary and wage disbursement at the physical education department in return for a fulfilled task such that the employees would be satisfied with their paychecks and consider their jobs as part of their lives and take pride in it. But the emotional intelligence of employees has a significant effect on their interpretation of fair play.

Establishment of safe physical working conditions and also setting reasonable working hours would definitely increase job satisfaction among employees. Therefore, directors of physical education department must always maintain the this thinking and provide proper conditions whereby employees may concentrate their emotions, lower their stress, make correct decisions, and take their self-confidence to the highest level possible which would result in safe work place. Moreover, the results suggested a positive and significant relationship between secure growth and emotional intelligence such that higher emotional intelligence of employees would yield more secure growth. Farahbakhsh (2012) concluded that increased emotional intelligence for improvement of better workplace is effective for directors and would thus escalade their performance. Security in terms of income and employment is a continuous demand of employees in different organizations and job security is a basic component in the lives of employees as the higher it is, the higher satisfaction and performance of employees will be. Research findings show a positive and significant relationship between individual rights and emotional intelligence. According to the reported correlation coefficient, this is an average relationship. Employees with higher emotional intelligence may better resolve their mental contradictions about salary and wages and therefore create quality of working life.

Another finding was the positive and significant relationship of social ties and emotional intelligence the latter would strengthen the feeling of belonging of employees to the organization and their social solidarity. The findings also suggested a positive and significant relationship between emotional intelligence and lifestyle. Providing for freedom of speech without fear of reactions from authorities and dominance of law over human power are symptoms of particular rules and regulations of an organization that need to be observed by both directors and employees. Therefore, higher emotional intelligence would lead to more employees abiding by the rules and increase in legal positivism. Social ties are the interpretation of employees of their social responsibilities within an organization, an index that has a significant and positive relationship with emotional intelligence. Employees' interpretation of social responsibility may differ from one another but they may pave the way for compatibility of individual emotion with social responsibilities. Moreover, improvement of human and individual capabilities, opportunities to progress and application of acquired skills is referred to as continuous growth. Growth and progress is the demand of majority of employees which differs based on individual capabilities. According to the results of current research, individual abilities and progress opportunities may increase as does the emotional intelligence. Directors must take into account that instruction of self-consciousness, self-control, self-stimulation, application of emotions to seeks social consciousness, discerning of emotions in others and management of relationships may accommodate the enhancement of human capabilities and lead to job promotions.

CONCLUSION

Improvement of quality of working life requires a comprehensive and extensive plan designed to meet their satisfaction, help them manage changes, retain the personnel and increase their productivity but this research showed that increase in emotional intelligence as a mental construct may lead to increased quality of working life. Since directors and policy-makers of Ministry of Sports and Youth are seeking the organizational objectives and the quality of working life is one of the most influential components to that end, they may use the findings of this research to raise the quality of working life among their employees based on their emotional intelligence so that they may increase job satisfaction and efficiency. Due to few research conducted in this area, these results must be interpreted with caution and further supplementary studies are still required but it was quite evident in this research that there exists a positive relationship between emotional intelligence and quality of working life and its micro-scales.

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Table 1. Kolomogorov-smirnov test.

Number	Significance	Statistic	Standard Deviation	Mean	Variable
305	<0/010	0/275	0/66	3/09	**Emotional intelligence**
305	<0/010	0/280	0/78	3/07	**Quality of working life**

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RESEARCH ARTICLE

Isolation of Antifungal Compounds from Medicinal Plants by Thin Layer Chromatography.

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ABSTRACT

The antifungal compounds of two medicinal plants viz., *Lantana camara* and *Bougainvillea glabra* was extracted by using ethyl acetate. The antifungal activity of the ethyl acetate leaf extracts of *Lantana camara* and *Bougainvillea glabra* were studied against the selected plant pathogen like *Pythium aphanidermatum, Macrophomina phaseolina, Phytopthora infestans, Aspergillus niger, Aspergillus flavus* and *Fusarium udum* by agar well diffusion method. The reduction of mycelial growth of the pathogens to an extent of 35 per cent over control was noticed. Thin layer chromatography (TLC) was performed for partial purification and separation of the antifungal compounds present in the extracts. The different bands of TLC were collected and assayed for their antifungal activity against the selected plant pathogen. The results showed that the 11th and 6th bands of *Latana camara* and *Bougainvillea glabra* respectively exhibited antifungal activity against the selected plant pathogens.

Keywords: Thin layer chromatography, leaf extracts, pathogens.

INTRODUCTION

In recent years there has been an increasing interest in the use of natural substances, some questions concerning the safety of synthetic compounds encouraged more detailed studies on plant resources. Essential oils, odorous and volatile products of plant secondary metabolites have wide application in folk medicine, food flavouring, and food preservation as well as in fragrance industries [1]. Many of the plants used today were known to the people of ancient cultures throughout the world for their preservative and medicinal powers. Scientific experiments on the antimicrobial properties of the plants and their components have been documented in the late 19th century. However, several plants are used in India in the form of crude extract, infusions or plaster to treat common infections without scientific evidence of efficacy. Hence, it is of interest to determine the scientific basis for the traditional use of these medicinal plants [2].

Recently, new approaches involving botanical fungicides are considered as an alternative to synthetic fungicides as they maintain low mammalian toxicity, against, target specificity and biodegradability. The botanical fungicides contain many active ingredients in low concentration possessing biocidal activity against several pathogens including bacteria, fungi and virus [3]. Plant diseases are the major biotic constraints to crop growth and causes variety of damage and significant yield loss. The diseases management requires effective integration of approaches to reduce the crop loss effectively. Several strategies have been developed based on genetic, chemical biological and cultural methods and also combined in integrated diseases management framework [4].

Many fungal diseases affect many crops. Control of fungal disease by use of resistant varieties has been very useful but the pathogen is able to develop into new physiological races over years and thereby they were able to overcome the resistance. This situation forced scientists to search for new antimicrobial substances from the various sources including medicinal plants. Keeping in view of these aspects research was formulated to isolate the antifungal compounds by TLC method.

MATERIALS AND METHODS

The fresh leaves of *Lantana camara* and *Bougainvillea glabra* were collected from the Tamil Nadu Agricultural University, Coimbatore. The collected plant material were shade dried, powdered and stored for conducting antifugal assays.

Preparation of plant extract

About 30 g of each plant powder was percolated with 150 ml of ethyl acetate separately (at the ratio of 1:5), and kept for overnight for digestion. After overnight extraction the extract was filtered using Whatman No. 44 filter paper and concentrated using rotary vacuum evaporator at 40°C to obtain dried extract, which was then stored at refrigerated condition for further use.

Preparation of test samples

300mg of dried extract of each plant sample were dissolved in 3.5 ml of ethanol and used in the antifungal assays. Ethanol solvent without the test compound was used as the negative control. An antifungal agent ketoconazole is used as positive control at a concentration of 10mg/ml.

Preparation and activation of TLC plate

Silica gel G (E-Merck) was used for preparing TLC plates (20 x 20 cm). Finely powdered silica-gel G (20 g) was mixed thoroughly with 40 ml distilled water. The slurry was then poured into TLC applicator, which was adjusted to 0.5 mm thickness and it was slowly moved onto the clean glass plate. A fine layer of 0.5 mm thick wet silica gel was formed uniformly on the entire glass plate. The glass plate was allowed to dry in the open air for one hour. Then, the glass plate with silica gel coating was heated in the oven at 110°C for two hours. In this way, TLC plate was activated. After activation of the TLC plate, the plant extract (5 µl) was spotted on the plate with the help of micropipette or capillary tube without disturbing the silica gel layer to assess the qualitative nature of the effective plant extracts and also to isolate the antifungal compound from the plant extract [5].

Separation of compounds

The solvent system dichloromethane: chloroform (7:1) was used as the mobile phase to separate the compounds. The mobile phase was poured in the TLC tank and the spotted TLC plate was kept in this with approximately 0.5 mm immersed in solvent at the bottom. The tank was closed with a glass lid so as to have the chamber completely filled with the solvent vapors. The plates were kept in the TLC tank till the solvent front reached the top of TLC plate. Then, the plate was removed from the tank and kept in open air at room temperature so as to enable the solvent to get evaporated.

The TLC run plates were observed under bright light and the separated spots were marked. The Relative front values were calculated by using the given formula

$$\text{Rf value} = \frac{\text{Distance moved by the solute from the origin}}{\text{Distance moved by the solvent from the origin}}$$

Detection of chemical groups

In pre coated silica gel sheets, ethyl acetate extract of plant *Lantana camara* and *Bougainvillea glabra* were run using the mobile phase dichloromethane: chloroform (7:1) and after TLC separation the sheets were kept in room temperature for drying. The TLC sheets were sprayed with chemical reagents *viz.,* folins reagent, vanillin sulphuric acid, phosphomolybdic acid, dragendroffs reagent, diazotized sulphanillic acid, and the observations were made.

Determination of Minimum Inhibitory Concentration (MIC)

The MIC was performed to test the antifungal activity of both the plant extracts and active bands using tube dilution method [6].

Statistical analysis

The data were analyzed using completely randomized design [7]. If the treatment differences are found significant in F test, critical differences was worked out at 5 per cent probability level.

RESULTS AND DISCUSSION

Thin Layer Chromatographic (TLC) studies of plant extract

In the present study ethyl acetate extract of *Lantana camara* was subjected to TLC separation, using mobile phase as dichloromethane: chloroform (7:1). Totally 11 bands were obtained with good separation (Fig 1 and Table 1). The individual bands were collected separately and checked for their antifungal properties. The active band 11 is

obtained with a Rf value of 0.8 cm. This band showed presence of phenolic group of compounds using Folins Ciocalteau spraying reagent. TLC studies of ethyl acetate extract of *Bougainvillea glabra* resulted in separation of 6 bands (Fig 2 and table 2). All the bands were studied for their antifungal properties. Among them band 6 possessed good activities. Band 6 showed blue colour spot when sprayed with Folins Ciocalteau reagent, which indicates the presence of phenolic group of compounds.

Twenty-one collections belonging to *Phyllatnthus niuri*. for the distribution of flavonoids using TLC [8]. Aqueous methanolic extracts were applied on TLC silica gel plates and the dimensional chromatography was carried in n-butanol:acetic acid:water (4:1:5) as solvent system. By analyzing the flavonoids composition was analyzed with UV max. The methanol extract of *Psoralea corylifolia* showed good antifungal activity and was subjected to TLC studies [9]. Two spots were separated with a R_f value of 0.44 (fluorescent yellow spot) and 0.15 (brown spot). The eluted fluorescent yellow spot showed an inhibition zone of 35mm and the brown spot showed no inhibition.

Minimum Inhibitory Concentration method for evaluation of antifungal activity

The minimum inhibitory concentration is the concentration at which 50% of the organisms get killed by the compound. The minimum inhibitory concentration of *Artemisia nilagirica* is 20 μg/ml against *E.coli*. However the MIC of *Achyranthes aspera* against *Staphylococcus aureus* and *Bacillus subtilis* are 30 μg/ml and 50 μg/ml respectively. The essential oils obtained from *Amomum subulatum* exhibited strong antifungal activity against pathogenic fungi [10].Aqueous extract of *Terminalia chebula* and *Terminalia bellerica* manifested a better MIC against *E.coli* (0.6 μg per ml) [11]. Different concentration of *Spilanthes cemella* flower head extract was evaluated for antifungal activity at concentration of 0.1 and 0.2 mg [12]. The minimum inhibitory concentration of *Achyranthes aspera* against *Fuarium udum* and *Aspergillus niger* are 30 μg and 40 μg respectively [2].

The lowest MIC was observed in the aqueous extract of *Myrtus communis* and *Terminalia chebula* as 0.31mg against *Candida albicans* and *Candida utilis* [13]. The n-hexane extract of *Azadirachta indica* showed marginal activity against *Aspergillus tenuis* (13.6%) and has no activity against *Dreschlera oryzae*. Even with synthetic fungicides, a minimum inhibition concentration (MIC of 1000-5000mg/litre) is considered good activity. Based on the inhibition profiles of the 90% methanolic extract of *Azadirachta indica*, it is evident that *Dreschlera oryzae* was the most susceptible among the three fungi, while *Fusarium oxysporum vasinfectum* and *Aspergillus tenuis* were less inhibitor [14]. Minimum inhibitory concentration of *Lantana camara* leaf extract upto 20 μg per ml against various plant pathogens including *Aspergillus niger* and *Aspergillus fumigatus* [6].

In the present study ethyl acetate extract of *Lantana camara* exhibit MIC against *Pythium aphanidermatum, Macrophomina phaseolina, Aseprgillus niger, Fusarium udum* at a concentration of 10 mg. It was clear that band 11 from the ethyl acetate extract of *Lantana camara* have also observed for their maximum inhibition at10 mg concentration in MIC assay. In other concentration *i.e* lesser than 10 mg of band 11 no inhibition was observed against all the tested four pathogens. In our present investigation 10 mg concentration of ethyl acetate extract of *Bougainvillea glabra* was found to be active against the three fungal pathogens *viz., Aspergillus niger, Aspergillus flavus and Fusarium udum* in MIC assay. While band 6 of *Bougainvillea glabra* obtained from TLC separation showed inhibition at 10 mg concentration against the fungal pathogens such as *Aspergillus niger, Aspergillus flavus, Fusarium udum*. The growth was observed in all other concentration of band 6 lesser than 10 mg in MIC assay. The MIC assays concludes the possibility of IC 50 values ranging between 1-10 mg for the band 11 of *Lantana camara* and as well as band 6 of *Bougainvillea glabra*.In conclusion the present study showed that the ethyl acetate extract of *Lantana camara* and *Bougainvillea glabra* was subjected to TLC separation, totally 11 bands and 6 bands were obtained respectively by using dichloromethane: chloroform (7:1) as mobile phase. Presence of phenolic compound was observed by spraying Folins Ciocalteaus reagent. Ethyl acetate extract of both the plant materials exhibit MIC at 10 mg concentration. The concentration lesser than 10 mg not found to be effective against the fungal pathogens.

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Table 1. Thin layer chromatography (TLC) ethyl acetate extract leaf extract of *Lantana camara*

No.	Color of the band	Distance traveled (cm)	R_f value (cm)
1.	Green	0.5	0.1
2.	Ash	0.7	0.14
3.	Light green	0.9	0.18
4.	Green	1.5	0.3
5.	Light yellow	1.7	0.34
6.	Light green	2.0	0.4
7.	Light green	2.5	0.5
8.	Light green	3.0	0.6
9.	Light green	3.2	0.64
10	Green	3.5	0.7
11.	Dark yellow	4.0	0.8
12.	Solvent distance	5.0	-

Mobile phase: Dichloromethane: Chloroform(7:1)

Table 2. Thin layer chromatography (TLC) ethyl acetate extract leaf extract of *Bougainvillea glabra* Visible observation

No.	Color of the band	Distance traveled (cm)	R_f value (cm)
1.	Green	0.3	0.05
2.	Ash	0.5	0.09
3.	Green	1.2	0.23
4.	Green	2.0	0.38
5.	Light green	2.2	0.42
6.	Yellow	4.0	0.76
7.	Solvent Distance	5.2	-

Mobile phase: Dichloromethane: Chloroform(7:1)

Table 3. Spray reagents used for *Lantana camara* plant extract

Spray reagents	Color of the band	R_f value (cm)
Folin- Ciocalteu reagent	Blue colour spots	0.8
Vanillin sulphuric acid	–	–
Dragendroffs reagent	–	–
Diazotized sulphanilic acid	–	–

Table 4.Spray reagents used for *Bougainvillea glabra* plant extract

Spray reagents	Color of the band	R_f value (cm)
Folin- Ciocalteu reagent	Blue colour spots	0.76
Vanillin sulphuric acid	–	–
Dragendroffs reagent	-	-
Diazotized sulphanilic acid	–	–

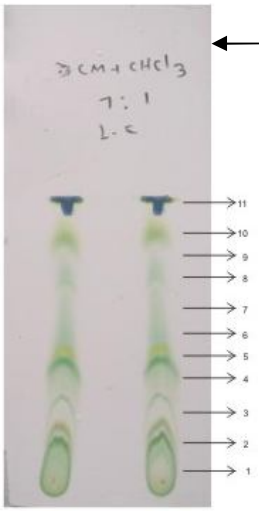
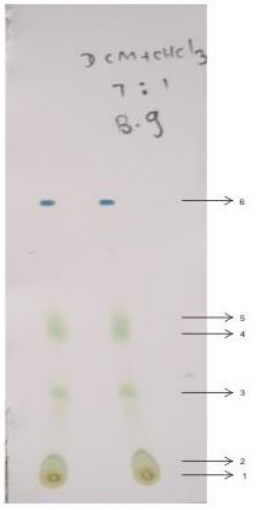


Fig 1. Thin layer chromatography for *Lantana camera* plat extract by using FCR reagent.

Fig 2. Thin layer chromatography for *Bougainvillea glabra* plant extract by using FCR reagent.



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RESEARCH ARTICLE

The Relationship between Management Style and Organizational Culture with Employees' Job Satisfaction (Case study -Islamic Azad University, Quchan Branch).

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ABSTRACT

Effective management and organizational culture are two factors that influence significantly on employees' job satisfaction; and job satisfaction is considered as the basis of organizational success. So the purpose of present paper was study of the relationship between organizational culture and management styles with job satisfaction of employees of Islamic Azad University of Quechan in 2012(1391 HS). To this end, a sample of 153 employees of Islamic Azad University of Quchan has been selected and questionnaires of management style, job descriptive index and Hosted organizational culture have been used for collecting data. Chronbach's alpha for above questionnaires has been obtained 0.835, 0.785 and 0.889, respectively indicating high reliability of the questionnaires. The results obtained from correlation tests supported the relationship between management style, organizational culture and job satisfaction so that there was a significant relationship between relationship-oriented and task-oriented management styles with job satisfaction. However, the first relationship was positive with 18% effect and the second was negative with -113% effects. There was also a negative relationship between job satisfaction with variables of power distance (-15%), risk avoidance (-12%), individualism (-11%) and masculinity (-12%). In total, it was concluded that there is a significant relationship between management style and organizational culture. Considering the findings it is necessary to take measures for promoting job satisfaction in this organization. Greater use of devolution, extending freedom and independence of staff, using job incentives including material and non material rewards are among the important measures.

Keywords: management style, organizational culture, job satisfaction, Islamic Azad University.

INTRODUCTION

Today's world is undoubtedly of special characteristics. One of the special characteristics of our times is dramatic changes that are evident in ideology, mentality, social values and practices. Among the phenomena that are influenced significantly by these changes are organizations. Most of the changes that organizations face with have such a speed and power that in the today's world of increasing competition remove any resistance. The role of organizations in achieving social, cultural, political and economic goals is so prominent that organizations of any society are called carrousels of achieving goals (khanifar and Vakili, 2008). One of the important issues in human resources management in organizations is to meet human needs and providing incentives to enhance their work quality. The attentions paid to this basic factor indicate the importance of manpower as a valuable capital for managers. Since manpower efficiency can't be always predicted by economic calculations, many other factors resulting from superior human needs in social aspects of respect and self-discovery are involved in (Hosseinzadeh & Saemian, 2002).

Consequently for the manpower of organizations to be efficient and job productivity to be at a desirable level, findings and principles of psychology in the workplace should be used (Kavousi, 1998).Organizations as the main pillar of contemporary societies have determining roles in meeting expectations of the societies and manpower is considered as the most valuable resource for organizations. Therefore, paying attention to employees needs and meeting their mental and physical needs and their satisfaction are of special importance in order to enhance productivity and efficiency of organizations. Management is considered as the most important factor affecting the life or death or growth of organizations and the process of moving from current state to the desired state is led by a manager. Human has a multidimensional personality and various capabilities as well as a set of beliefs, values, desires, expectations and feelings so that there are idiosyncratic outcomes depending on personality, environmental effects on behaviors and incentives (Zamini and Hosseini Nasab).It is clear that organizational managers can control social and occupational behaviors and actions of employees and provide job satisfaction by establishing a strong culture and using different methods (Rabinz, 2007).

The necessity and importance of the research

One of the issues raised in organizational literatures is job satisfaction. Job satisfaction is the most important and common research topics raised in the field of organizational behavior studies (Specter, 1997).Studying job satisfaction in organizations is considered as a tool of data collection and enables managers to first compare divisions and working groups and secondly prioritizes problems and thirdly indentifies perceptions and expectations of employees in order to bridge the gap between current and ideal states.Since job satisfaction plays an important role in organizational development as well as the workforce health, the concept is considered very important in all levels of organizational management and human resources; On the other hand, different fields of humanities including psychology, sociology, economics and management have focused on it.

An important factor that may affect employees' job satisfaction is management style. There is no doubt that management is the driving force of an organizational development and the key to salvation, prosperity and independence of an organization (Tayebi, 2007). To be successful, managers should have leadership qualities so that employees welcome them. Having leadership traits and abilities makes the presence of management to be accepted at work and among his/her colleagues. In fact, a good management style and appropriate leadership abilities and traits may reduce arbitrary imposition of management and increase its natural look (Mirkamali, 2005). In order to perform his/her duties properly and to achieve the goals of the organizations, a manager shall seek to meet human needs and establish good human relations. When managers can't select an appropriate style to lead, guide and perform duties, a bad atmosphere and thereby inappropriate organizational behavior is created in the organization affecting the behaviors of organizational members adversely leading to inefficiency, dissatisfaction and reduced organizational effectiveness. So there is no doubt that management and its styles affect on all parts of an organization including

human resources, and these main capitals of any organization can have the most effect, especially in higher education in which the most resources are humans. This main factor, management style, has the most effect on employees. Management styles are issues that have long been received the interests of scholars and many researchers have been performed on it. With regard to the fact that meeting mental health needs of human resources is of special importance for the development of each country and meanwhile universities as an important element of development in any country have a special place, so the present paper intends to identify leadership styles and cultural attitudes in Islamic Azad University of Quchan in order to examine job satisfaction of employees and the relationship between these variables.By demonstrating effective factors contributing to the creation and increase of employees' satisfaction in the respective society, in this paper we attempt to help managers of this and other organizations to be able to enhance productivity of their organizations through increasing job satisfaction by removing obstacles and reinforcing strengths.

Research Objectives

The main objective: To identify the relationship between management style and organizational culture with job satisfaction of employees of Islamic Azad University of Quchan.
Secondary purpose:1. To identify the relationship between management style (task-oriented and relationship-oriented) and job satisfaction of employees of Islamic Azad University of Quchan**2.**To identify the relationship between organizational culture and job satisfaction of employees of Islamic Azad University of Quchan.

Research Hypothesis

Main hypothesis

There is a significant relationship between management style and organizational culture with job satisfaction of employees of Islamic Azad University of Quchan.

Secondary Hypothesis

1. There is a significant relationship between relationship-oriented management style and job satisfaction of employees of Islamic Azad University of Quchan.
2. There is a significant relationship between task-oriented management style and job satisfaction of employees of Islamic Azad University of Quchan.
3. There is a significant relationship between organizational culture and job satisfactionof employees of Islamic Azad University of Quchan.

Variables

1. **Independent variables**: Management Styles, Organizational Culture
2. **Dependent variable**: Job satisfaction

Cross-cultural organizational behavior is the study and analysis of team processes and individual behaviors based on cultural and national characteristics and frameworks where cultural characteristics play an important role and culture is investigated as an independent variable and a mediator(interface) in relation to organizational behavior issues (Tosui et al., 2007). Cros-cultural researches are indicative of how culture is related to micro organizational phenomena (e.g. motivation, cognition, feelings and emotions), inter-organizational level (e.g. teams, leadership and negotiation) and macro-organizational level (e.g. organizational culture, organizational structure) as well as what effects the culture has on the interactions of the respective three levels (Golfand et al., 2007; quoted by Zaki, 2007).

Agiunis and Henle (2003) reviewed thirteen reference books and educational sources of organizational behavior (during 1980-2001) considering 17 topics of cross-cultural organizational behavior. Based on reviewing the respective literatures, they classified eight subjects studied into four levels of national (e.g. national values), organizational (e.g. organizational development and growth, organizational culture), group (e.g. work teams, conflict and negotiation, leadership) and individual (work incentives and decision making). These eight topics are the main challenges of cross-cultural organizational behavior having roots in previous studies; but they are considered as future challenges. One of their findings is that among 17 fields of organizational behavior, occupational and organizational values and attitudes (e.g. job satisfaction) is the most common subject raised in the thirteen educational resources studied.

Golfand, Arzoaykan (2007) tried to introduce and study key challenges and issues in cross-cultural organizational behavior. Having reviewed numerous studies, they classified important challenges into six main categories. According to cross-cultural organizational behavior literatures reviewed, individual (goals and incentives) and situational (feedback, rewards, job characteristics and job attitudes) factors are considered as predictors of work motivation. So job satisfaction (as one of instances of job attitudes) is regarded as one of factors affecting work motivation.Tosui et al. (2007) analyzed the papers contents of 16 scientific journals of organization and management on cross-cultural organizational behavior during 1996-2005.

The final model suggested points to two categories of researches on intercultural organizational behavior: a) researches (55) in which culture is considered as independent variable affecting individual and interpersonal behavior characteristics and finally organizational behavior. b) Studies (28) in which culture is considered as mediator variable between individual and interpersonal behavior characteristics and finally organizational behavior. One of their results is that job satisfaction is one of individual behavior characteristics which can form organizational behaviors and attitudes of people mediated by culture.Organizational culture can have positive effect on organizational effectiveness indices such as performance, commitment, self confidence and ethical behaviors of employees and workers. Since job satisfaction is considered as an important index in organizational behavior where organizational culture can play an important role, many researchers have been performed on it including but not limited to the followings.

Mossadegh Rad (2008) conducted a research on job satisfaction of employees of medical centers in the city of Isfahan according to Specter's questionnaire in order to test a hypothetical model on job satisfaction. According to Mossadegh Rad's hypothetical model, three categories of individual, job and organizational factors affect job satisfaction. Among job satisfaction effects, the intention to stay and the intention to leave have been selected.

METHODOLOGY

The present paper is an applied and correlation research. In this type of research, the relationship between variables is analyzed based on the research purpose.

Statistical population

Statistical population is all employees of Islamic Azad University of Quchan including 153 people who are serving in this organization during 2012-2013

Sample and sampling method

To determine sample size, in this research simple random sampling technique was used. In this way, all members of the population (sampling unit) have equal chance to be selected. In the present research, at first the statistical population which was 242 members was numbered and then according to Morgan table determining sample size based on population size, 142 people were selected randomly and questionnaires were distributed among them.

Data Measurement Tool

Bardenz and Metkas's (1969) Management Style Questionnaire.The questionnaire includes 16 5- choices questions with the choice of always, often, sometimes, rarely and never. The numbers of questions that measure each of the two above mentioned styles are: questions 1,3,5,7,10,12,14,16 for relationship-oriented and questions 2,4,6,8,9,13,11,15 for task-oriented.

Hosted Organizational Cultural Questionnaire (HOCQ)

The questionnaire uses five point Likert Scale for each item (very little to very much) allocated the scores of 1 to 5, respectively. Having calculated total score of the questionnaire (between 23 to 115), average score of statistical sample is calculated.

Statistical methods of data analysis

In this research, descriptive statistics are used to describe data (mean, median and standard deviation) and in inferential statistics multivariate regression and Pearson correlation coefficient are used to test hypotheses.For statistical analysis, the software SPSS was used.

Data analysis

Testing Hypotheses

Main Hypothesis: There is a significant relationship between management style and organizational culture with job satisfaction of employees of Islamic Azad University of Quchan.

1st Secondary Hypothesis: There is a significant relationship between relationship-oriented management style and job satisfaction of employees of Islamic Azad University of Quchan.
H_0: There is no significant relationship between relationship-oriented management style and job satisfaction of employees of Islamic Azad University of Quchan.
H_1: There is a significant relationship between relationship-oriented management style and job satisfaction of employees of Islamic Azad University of Quchan.
2nd **Secondary Hypothesis**: There is a significant relationship between task-oriented management style and job satisfaction of employees of Islamic Azad University of Quchan.
H_0: There is no significant relationship between task-oriented management style and job satisfaction of employees of Islamic Azad University of Quchan.
H_1: There is a significant relationship between task-oriented management style and job satisfaction of employees of Islamic Azad University of Quchan.

3rd Secondary Hypothesis: There is a significant relationship between organizational culture and job satisfaction of employees of Islamic Azad University of Quchan.
H_0: There is no significant relationship between organizational culture and job satisfaction of employees of Islamic Azad University of Quchan.
H_1: There is a significant relationship between organizational culture and job satisfaction of employees of Islamic Azad University of Quchan.
Above hypothesis also includes testing the following secondary hypotheses:
1.There is a significant relationship between power distance and job satisfaction of employees of Islamic Azad University of Quchan.

2.There is a significant relationship between risk avoidance and job satisfaction of employees of Islamic Azad University of Quchan.
3.There is a significant relationship between individualism and job satisfaction of employees of Islamic Azad University of Quchan.
4.There is a significant relationship between masculinity and job satisfaction of employees of Islamic Azad University of Quchan.

RESULTS AND CONCLUSION

Table 1 shows the relationship and the effect size of independent variables of management style and organizational culture and significance level of the effect on the dependent variable job satisfaction. As seen in the table, there is a significant relationship between variables of management style and organizational culture with job satisfaction ($p<0.05$). Impact factors for management style and organizational culture are 0.287 and 0.393, respectively.As seen in table 2, coefficient of determination is 53.4% implying that the variables (management style and organizational culture) explain 53% of the dependent variable job satisfaction and 47% depends on other factors.

In the table3, we want to know that which of the independent variables (management style components) has any or no effect on the dependent variable (job satisfaction). Significance of independent variables with dependent variable and beta coefficients of them are shown in the table. As shown in the table, task-oriented and relationship-oriented variables are of significance relationship with job satisfaction ($p<0.05$). However, relationship-oriented component has a direct and positive relationship with 18% impact and task-oriented component has an inverse and negative relationship with -11% impacts.As seen in the table 4, coefficient of determination is 27% implying that the variables (management style components) explain 27% of the dependent variable job satisfaction and 64% depends on other factors.In the table 5, we want to know that which of the independent variables (management style components) has any or no effect on the dependent variable (job satisfaction). Significance of independent variables with dependent variable and beta coefficients of them are shown in the table. As shown in the table, variables of power distance with -10%, risk avoidance with -12%, individualism with -11% and masculinity with -21% have a significant relationship with job satisfaction ($p<0.05$). It is of note that this effect is inverse and negative.

As seen in the table 6, coefficient of determination is 49% implying that the variables (organizational culture components) explain 49% of the dependent variable job satisfaction and 51% depends on other factors.

1st &2nd Hypotheses: There is a significant relationship between management style (task-oriented and relationship-oriented) and job satisfaction of employees of Islamic Azad University ,Quchan Branch.
By examining the relationship between management style and job satisfaction it was concluded that there is a positive and significant relationship between relationship-oriented management style and employees' job satisfaction. However, there was found an inverse and negative significant relationship between task-oriented management style and job satisfaction. This may be due to the fact that people in workplace and the atmosphere dominating on their organizations demand human relations and interactions rather than task- and ranking- or authority-based relations. Now management experts believe that if real needs of employees aren't understood and appreciated properly and managers don't seek to satisfy them, productivity will be reduced in the organization because positive attitude and interest in job lead to more working efforts and thereby lower costs. So it is suggested that managers and planners make decisions and plan considering the role of employees in the organization and involve them in organizational decision making and planning for example by establishing thoughts and consulting rooms, suggestion/feedback box about management style.Because these are employees who finally expand and flourish the performance and future career of the organization.

3rd Hypothesis: There is a significant relationship between organizational culture and job satisfaction of employees of Islamic Azad University of Quchan.

Considering the relationship between organizational culture and job satisfaction, it is suggested to use two strategies of inner and outer culturalization. In inner method, managers and employees of the organization become familiar with the concepts of organizational culture and culturalization methods by attending training workshops and in-service courses. In outer approach, organizational structure, regulations and laws can be transformed by providing a suitable environment and working conditions and using state of the art technology. By examining the relationship between organizational culture and management style in two directions of relationship-oriented and task-oriented, it was found that there is a significant and positive relationship between organizational culture and task-oriented management style. Also by examining the relationship between organizational culture and relationship-oriented management style about three components of power distance, individualism and masculinity, only there was found a significant relationship with risk avoidance. By examining the two hypotheses it was concluded that effective management and achieving maximum efficiency in each organization depend on recognition of human resources and using them effectively.

In sum, the results of the analysis indicate that management style variables and organizational culture have significant relationship with job satisfaction. Having discussed the research hypotheses, it was concluded that job satisfaction is the extent of positive feelings and attitudes toward its own job. Job satisfaction is the result of employees' perceptions providing job content and context of what is important for them and such feelings greatly depend on the culture and atmosphere dominating on the organizational management.Considering the findings it is necessary to take measures for promoting job satisfaction in this organization. Greater use of devolution, extending freedom and independence of staff, using job incentives including material and non material rewards are among the important measures. The presence of a management and employee-oriented management who don't consider it only within the authority but an appropriate opportunity for cooperation and productivity is very important because if a manger or a leader has a biased and regulation-based management regardless of meeting the employees' needs and their satisfaction and morale, certainly employees' productivity and job satisfaction are questionable.

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Table 1: Multivariate regression for identifying impact factor and significance of independent variables of management style and organizational culture on the dependent variable job satisfaction.

Significance level	t	Standardized coefficients	Nonstandard coefficients		
		Beta	Standard deviation	Beta	
0.000 0.012 0.009	4.954 1.936 1.680	0.287 0.393	1.667 0.279 0.178	52.421 0.379 0.474	**Constant management style job satisfaction**

Table 2: **Coefficient of determination and adjusted coefficient.**

Standard deviation	Adjusted R	R	R2
3.524	0.526	00.731	0.534

Table 3: Multivariate regression for identifying impact factor and significance of independent variables of management style (task-oriented and relationship-oriented) on the dependent variable job satisfaction.

Significance level	Nonstandard coefficients	Standardized coefficients	Nonstandard coefficients		
		Beta	Standard deviation	Beta	
0.000 0.012 0.031	5.944 2.037 -1.345	0.187 -0.113	10.667 0.373 0.276	63.401 0.387 -0.371	**Constant management style organizational culture**

Table 4: Coefficient of determination and adjusted coefficient

Standard deviation	Adjusted R	R	R2
2.4194	0.237	0.521	**0.275**

Table 5: **Multivariate regression for identifying impact factor and significance of variables and organizational culture dimensions on employees' job satisfaction.**

Significance level	t	Standardized coefficients	Nonstandard coefficients		
		Beta	Standard deviation	Beta	
0.000	5.623		1.567	65.041	**Constant**
0.050	-1.600	-0.151	0.540	-0.923	**Power distance**
0.031	-2.291	-0.125	0.850	-0.539	**Risk avoidance**
0.029	-2.321	-0.113	0.601	-2.115	**Individualism**
0.019	-0.114	-0.210	0.125	-0.128	**masculinity**

Table 6: **Coefficient of determination and adjusted coefficient**

Standard deviation	Adjusted R	R	R2
2.5194	0.211	0.498	**0.223**

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RESEARCH ARTICLE

Designing a Model of Knowledge Sharing among Faculty Members of Islamic Azad Universities of Mazandaran Province.

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ABSTRACT

This study presents the knowledge-sharing model based on individual and organizational factors related to faculty members. To achieve this goal, individual and organizational factors were presented through qualitative research in the form of open codes, axial, and selective observations; then, the final model was obtained using structural equation model. Participants included 1,719 faculty members of the Azad Universities, Mazandaran Province, Region 3. The samples related to qualitative survey included 25 faculty members experienced at teaching and the samples related to quantitative survey included 326 faculty members selected by multistage cluster sampling. A 72-item questionnaire was used to measure the quantitative variables. The reliability of the questionnaire was 0.93. Its content and face validity was determined with the help of faculty members, consultants and other experts. For the analysis of quantitative data obtained from structural model and regression, SPSS and LISREL were used. The results showed that the status of knowledge sharing is moderate in the universities. Individual factors influencing knowledge sharing included the sharing of educational materials, perception, confidence and knowledge self-efficiency, and organizational factors influencing knowledge sharing included structural social capital, cognitive social capital, social capital relations, organizational communication, organizational structure, organizational culture, IT infrastructure and systems of rewards. Finally, it was found that the contribution of individual factors on knowledge sharing was more than organizational factors; therefore, a model was presented in which contribution of individual and organizational factors were determined.

Keywords: knowledge sharing, social capital, organizational communication, knowledge self-efficiency, perception, trust, organizational culture

INTRODUCTION

Universities and institutions of higher education are knowledge-based organizations in which access to knowledge and continuous learning is crucial for faculty members to play their roles and functions. Due to the spread of knowledge and the limitations of individuals and institutions around the existing knowledge, knowledge sharing has become increasingly important. Higher education institutions through their faculty members can acquire new skills, concepts and share and deliver knowledge (Turban et al, 2007). University have been always an environment for generation, storage, or expansion of knowledge. Knowledge as the intellectual capital of the organization has become increasingly important in enhancing competitive advantages. For such capital in organizations, Members must make their knowledge available, i.e., to share their knowledge with their colleagues (Hoof and Huysman, 2009). Given the interest of faculty members in the production, deliver and application of knowledge, sharing of knowledge may provide more opportunities to exchange ideas and engage in collective action. As a result of these activities, their effectiveness increases on the success of their organizations (Kim and Ju, 2008). Therefore, a systematic structure is required to stimulate and encourage faculty members to exchange knowledge with each other. Concept of knowledge sharing reflecting the process of knowledge is wider than the simple knowledge delivery. Hoof and Huysman (2009) emphasize that knowledge management can be a personally, mentally, socially, and implicitly related to daily activities. Therefore, knowledge sharing is not mandatory. Rather, it is a result of motivation and desire to share, desire for social interaction and generosity, which is called "emergency approach" towards knowledge sharing. The basic concept is that knowledge sharing does not depend on management intervention, but on social capital of a group of people. Being aware of the fact that knowledge cannot be directed from outside the organization, the management has decided to pay more attention to its role in knowledge management. Another approach addressed by Hoof and Huysman is the engineering approach to knowledge sharing. This approach assumes that sharing knowledge can be managed.

The underlying assumption is that management can create an ideal environment for this process to play a good role in the organization. They believe that sharing knowledge cannot be created under pressure, structural or organizational tools, but through rich social interactions. On the other hand, knowledge sharing is not just knowledge delivery, but creation as well. It seems that most organizations do not hit the goals intended to share knowledge. Perhaps it is due to the lack of a clear relationship between knowledge management strategies and goals of the organization and on the other hand, isolating knowledge-sharing activities from other activities of the organization. For personnel, barriers of sharing are often recognized by factors such as lack of communication skills and lack of social networks, differences in national cultures, overemphasis on the opportunities and the lack of knowledge and trust. At the organizational level, barriers are associated with economic capabilities, lack of infrastructures and resources and availability of formal and informal meetings and physical environment (Riege, 2005).

Reviewing and prioritizing cultural factors affecting knowledge sharing in petrochemical research facilities, Pahlavani et al (2010) concluded that mutual trust and communication between workers and information systems, reward systems and organizational structure are the most important factors in sharing of knowledge. Sardari et al (2010) studied the role of IT management and communications in promoting management performance and knowledge sharing. They found that IT and communications were effective on gradual emergence of knowledge-based organizational culture.Hoseyni et al (2008) determined the effective factors on delivery and exchange of knowledge between departments of rehabilitation and organizations providing rehabilitation services in order to find a suitable solution for effective knowledge delivery. The most important factors identified in this research included weaknesses of identifying requirements of the society in the design of research projects, individualistic culture, lack of teamwork and lack of structural relationships between universities and organizations providing rehabilitation services. Appropriate strategy for effective knowledge delivery in this study was joint committee or organization between users and producers of knowledge to respond to the needs and facilitate the process of knowledge delivery. To examine the direct and indirect effects of quality and self-efficiency of knowledge management system,

organizational environment and attitude to willingness to share knowledge through production of new products, Chen et al (2012) concluded that attitude is the key effective factor on intention to participate in knowledge-sharing activities. Whatever a factor (such as self-efficacy of knowledge management system and organizational climate) can positively contribute to the attitudes, it can help knowledge sharing more. They found that knowledge management system plays an important role in determining those knowledge-sharing behaviours integrating organizational knowledge and supporting organizational knowledge processes in the production of new products. However, they noted that knowledge management systems are not a final solution, but in fact a tool to help members of the organization to manage the organizational knowledge effectively. From a managerial point of view, they refer to these points that knowledge management system is a tool which particularly supports the explicit knowledge. On the other hand, organizational knowledge is also tacit depending on the context; it is hardly imitable and it cannot be encoded. According to certain kinds of knowledge sharing, companies need to develop a culture of sharing and encouraging people to engage in problem solving, communication and interaction. Therefore, companies should emphasize the growing capabilities of their staff and sharing culture instead of focusing on information technology. They also emphasized that employees are considered as specific elements to share knowledge. Thus, the most important art is to foster a positive organizational climate (e.g., bilateral relations, mutual aid and communication channels). They agreed on the need of organizations to train their employees to take the skills that can enhance their capabilities. Once people acquire the ability to use knowledge management systems, their willingness and intention will increase.

Ighbal et al (2011) studied knowledge sharing among university staff and innovation capability of the university. The results showed that increased knowledge sharing behaviours had a positive effect on innovation capabilities of university. In addition, self-efficacy and social network helps to develop knowledge sharing which is positively related to increase in knowledge sharing behaviours. "Trust" is considered as a positive bond to develop and desire for knowledge sharing. Moreover, there is a unique relationship between attitudes, social norms, trust and willingness to share knowledge, which results in support for organizational innovation capabilities.

Al-adaileh (2011) studied the effect of organizational culture on knowledge sharing. This study investigated the influence of organizational factors such as trust, collaborative work environment, common vision, management activities on knowledge sharing in phosphate mining company in Egypt. Findings showed that cultural characteristics are regarded as important factors which can determine the extent of knowledge sharing in an organizational context. In fact, they have stated that organization is considered as a social unit in which the level of trust, cooperation and interaction between people, their vision and management are very important social trait. Emphasis on cultural characteristics not only is related to try to understand culture of the organization, but also emphasizes the strengthening of a set of cultural characteristics which can support knowledge management in general and knowledge sharing behaviours in particular.

Salim et al (2011) conducted a study to understand the attitudes and willingness to share knowledge and explore factors influencing these concepts. The results indicate that both intrinsic and extrinsic factors are important in development of attitudes and willingness to share knowledge; however, it was found that intrinsic factors, especially "seeking pleasures from helping others" play a special role in attitude and willingness to share knowledge. Participants in this study considered knowledge sharing as a helpful and valuable experience and stated that they would share their knowledge. Staff believed that although sharing of knowledge between colleagues would not influence the existing relationships and organization would not motivate them to share knowledge, they considered knowledge sharing as a pleasurable activity. In addition, they also felt that their knowledge was valuable and certainly influenced the effectiveness of the work of others.

Li and Haiyan Wang (2010) conducted a study to explore the factors affecting the willingness to share tacit knowledge. The results indicated that individual characteristics (satisfaction of needs, self-respect and altruism), internal mechanisms (interpersonal trust, team cohesion and strong leadership) and the support framework (sufficient resources and self-efficacy) were particularly related to tendency to share tacit knowledge.

Ismail and Yosuf (2010) examined the Effect of individual factors on the quality of knowledge sharing. They concluded that individual factors (awareness, trust and character) were strongly correlated to the quality of knowledge sharing. Character has been recognized the strongest factor influencing the quality of knowledge sharing in this study.

Zaeri Matin et al (2010) studied knowledge sharing systems in management organizations, tried to identify structural, behavioural, social, cultural, technological factors as intra-organizational capabilities and then examined their effects on Knowledge sharing behaviour. They found following results: there are positive tendency for knowledge sharing in organizations with cultural capabilities such as extroversion, employees' autonomy, respect for cooperation and outspoken behaviours, trust, low power distance and respect for employees; this will lead to improved performance in various aspects. Learning and growth are measures of organizational performance in organizations with low formality focusing on behavioural and structural capabilities for knowledge sharing. In such organizations, the tendency for mutual learning and innovation is very high. Innovation is one of the capabilities of sharing knowledge, which in itself will not lead to knowledge sharing, but also adds to speed and adequacy of sharing knowledge and increases transparency. Thus, the desire for knowledge sharing increases and organizational performance improves in all aspects, especially in financial aspects. Social capital can be a strong predictor for sharing knowledge and improve performance, especially in internal processes. In general, organizations with horizontal structure and the network based on team work, as well as organizational culture based on mutual trust, low power distance and high social capital in terms of relational, cognitive and structural factors, Availability of information technology and the wide application of fast data transfer networks, are considered as key factors for knowledge sharing which causes a positive tendency to share knowledge and eventually knowledge sharing itself.
Shim and Roth (2009) conducted a study to investigate the process of sharing learning and teaching skills by teachers. They used qualitative methodology by semi-structured interviews to evaluate and modify sharing of skills. Through interviews, it became clear that these teachers encountered obstacles to share their skills with others. One of the barriers was warning them not to violate the laws governing higher education institutions. In addition, they must comply with the environmental barriers such as scheduling and physical environment. It was found that elimination of these obstacles could provide secure ways to share teaching skills.

He and Wei (2009) conducted a study to answer the question that "what gives continuity to the sharing of knowledge?" This study validated and expanded knowledge management systems from two points: 1) Knowledge Share, 2) knowledge search. In the context of knowledge management, this study analysed "continuity" model from this point that the constant desire of knowledge users as well as facilitating organizational situations predict constant knowledge sharing behaviours in the organization by the knowledge management system, while the "intention and desire" are determined by beliefs and attitudes of users. The results showed that cognitive beliefs of users vary based on the role of these beliefs in influencing desire and intention to share knowledge in different contexts. Knowledge workers refer to knowledge management system and share their knowledge because of Social relationships, enjoy of helping others, administrative support, taking into account the costs associated with helping behaviours, and not because of imagination, reciprocity and organizational reward.

Kim and Ju (2008) studied the main factors influencing knowledge sharing, perception and attitude of faculty members towards knowledge sharing and collaboration in academic institutions. They examined six key factors, identified in previous studies, in a private university in North Korea; the factors included those related to "relationship" (perception, trust, openness in relations and cooperation) and factors related to "structure" (reward system and IT-based communication channels). This study found that only two factors, "perception" and "reward system" had a positive impact on knowledge sharing in university. According to the regression analysis undertaken in this study, it was found that "perception" and reward system were the highest and second highest influential factors on knowledge sharing among faculty members.

Considering above, the problem is that level of Knowledge sharing between university faculties is not clear; with regard to cultural and economic context, moreover, barriers and facilitators of knowledge sharing behaviours are not

clear. One way to promote this behaviour is to make the current status of knowledge sharing clear and to know how to reach the optimal status. What factors are decisive and effective, what is the contribution of each factor on knowledge sharing and, finally, what model can be developed for knowledge sharing between university faculties? By clarifying the status of knowledge sharing between faculty members, identifying effective factors and determining the contribution of factors, this study will eventually develop a model using quantitative and qualitative data from interviews, questionnaires and literature. This model is expected to be able to contribute knowledge sharing by faculty as a guideline for development and management of knowledge resources in universities. In order to achieve this goal, consider the following questions: The main question: what kind of a model can be developed for knowledge sharing among faculty members of university? Special Questions are mentioned as follows:

1: How knowledge sharing works in universities?
2: What are the individual factors influencing knowledge sharing?
3: What are the organizational factors influencing knowledge sharing?
4: how individual factors contribute knowledge sharing?
5: how organizational factors contribute knowledge sharing?

METHODOLOGY

Methodology of the present study was correlation by structural equation modelling. The purpose of the study can be regarded from extended and practical angles. This study is an extended research in which a new subject, particularly among educational management studies and the researcher tries to play a new role in knowledge-sharing management by this study. Results from analysing findings can be used in practice, because these results are used by Azad Islamic Universities; therefore, the present study can be a practical research. The used data is combinational, ie, both qualitative and quantitative data were obtained. Participants consisted of all faculty members of Islamic Azad Universities in Mazandaran province in Region 3. In the qualitative research, 25 faculty members were interviewed who had Teaching experience in educational institutions and published research papers in national and international conferences, authored and translated several books and scientific articles. To determine the quantitative sample size (326) and Krejcie and Morgan table was used. Cluster sampling method was also used. In this research, 342 questionnaires were distributed and 326 questionnaires were analysed to ensure that the net number of returned questionnaires was greater than above amounts. In this study, data were collected through semi-structured interviews. Interview started with general questions about status of knowledge sharing in university. Then, their opinions were asked about the factors influencing knowledge sharing among faculty members, including facilitating and inhibitory factors. All interviews were recorded with the written consent of the participants. Interviews lasted 35 to 60 minutes, on average. Immediately after the interview, the content was written word by word. This prevented ignorance of words or sentences.

For a deeper understanding and exploring the factors influencing knowledge sharing by discussing specific questions, the researcher directed the Faculty members to express their stories with the details necessary to understand the phenomenon and analysis. Individual and group interviews were conducted. Hence, both individual and group interviews together could provide richer and more comprehensive data. After conducting and writing interviews by the researcher, encoding was done in three stages, namely open, axial, and selective coding. In open coding, the first level of concepts associated with the study was identified and assigned codes. Given code were words of participants or implicit codes of researcher. Then, main codes were compared for similarities and differences. Codes with similar meanings were placed in one class; this step is called axial encoding in which, based on paradigm of Charmaz (2010), classes were extended and Similar classes were combined to reveal more implicit classes. Finally, selective coding was conducted in order to identify the main components. discussed Strategies and techniques used different tools to collect required data, including library methods (including research articles, books, journals and theses) and field method (including questionnaires and interviews). To evaluate knowledge sharing and effective factors, a 72-item closed questionnaire was used which was designed by 5-point Likert scale. For qualitative and quantitative evaluation of content, the researcher asked the experts to evaluate interviews and questionnaires

and provide feedback in order to modify the materials. To determine face validity, qualitative and quantitative items, simplicity, and complexity of the items, experts and professors were asked to give their opinions. In order to measure reliability of the measurement material, the Cronbach's alpha was used. For reliability of the sample, 50 received questionnaires were analysed by SPSS software. As a result, alpha coefficient was obtained for the total items (0.93). This number indicates that the questionnaire is reasonably reliable.

RESULTS

Special Question 1: How knowledge sharing works in universities?

Frequently, majority of interviewees stated that the status of knowledge sharing is not satisfactory; only a small percentage of faculty members found specialized group sessions optimal only in the form of knowledge sharing. According to different departments at the university and due to the lack of coordination between groups by the directors of university, Status of knowledge sharing is not optimal. Therefore, 32% of the interviewees thought that knowledge sharing is weak in universities. 32% of respondents found the knowledge sharing quite moderate and 20% of those interviewed reported that knowledge sharing was moderate in the university.In Order to evaluate knowledge sharing from the perspective of faculty members in the form of quantitative analysis, a 7-item questionnaire was designed (Table 2). Average of seven items was considered as the score of knowledge sharing.

Table2, score of the items related to the assessment of knowledge sharing was >3 (average of 5-point Likert scale). Quantitative findings from the first item indicated that faculty members saw knowledge sharing as moderate. The highest score was related to knowledge sharing status and experience of faculty members (mean score 3.96) and the lowest score was related to informing scientific projects (mean score 3.43). A standardized factor loading of seven items was 0.5, which indicates the significance and optimality of items representing knowledge sharing.

Special Question 2: What are the individual factors influencing knowledge sharing?

To answer this, At first it was necessary to use a qualitative research to classify components of individual factors in the form of open and axial codes identified in tables related to facilitating ways and barriers of knowledge sharing; Finally, key components effective on knowledge sharing were determined using selective encoding and literature review. The following table defines open codes related to facilitating ways and barriers of knowledge sharing in the form of individual and organizational factors.The names chosen for these open codes were mostly based on the words used by faculty members in interviews. Findings from axial encoding show that knowledge-sharing characteristics, if any existed, such as cooperation in 75% and knowledge participation in 64% have been considered as re-encoded data in positive dimensions. Thus the interviewee considered causal conditions as organizational structure and organizational culture (73% and 68%, respectively), Conditions interfering with the use of IT infrastructure (71%), knowledge self-efficiency (73%), reward system (78%), organizational communication system (79%), and social capital (75%). On the other hand, appropriate working environment to adopt suitable strategies and support of senior managers (61%) and optimistic success rate (67%) have been determined. Finally, individual factors influencing knowledge sharing based on selective coding include sharing educational materials, trust, perception and knowledge self-efficiency. These factors were found by qualitative analysis of interviews and simultaneously references to the literature.

Special Question 3: What are the organizational factors influencing knowledge sharing?

Organizational factors affecting knowledge sharing based on the selected encoding include organizational culture, organizational structure, corporate communications, IT infrastructure, structural social capital, cognitive social capital, and social capital relationships, support of senior management and reward systems.

Special Question 4: How individual factors contribute knowledge sharing? (Fig.1)

Direct effect: individual factors 0.88
Indirect effects:
Educational material sharing: 0.81 × 0.88 = 0.7128
Knowledge self-efficiency: 0.44 × 0.88 = 0.3872
Perception: 0.61 × 0.88 = 0.5368
Trust: 0.54 × 0.88 = 0.4752
Obviously, educational material sharing and knowledge self-efficiency have the highest and lowest contribution, respectively.

Special Question 5: how organizational factors contribute knowledge sharing? (Fig.2)

Direct effect: organizational factors 0.37
Indirect effects:
Organizational structure: 0.76 × 0.37 = 0.2812
Organizational culture: 0.86 × 0.37 = 0.3182
Senior management support: 0.74 × 0.37 = 0.2738
IT infrastructure: 0.65 × 0.37 = 0.2405
Reward system: 0.69 × 0.37 = 0.2553
Organizational communication system: 0.77 × 0.37 = 0.2849
Structural social capital: 0.60 × 0.37 = 0.2220
Cognitive social capital: 0.56 × 0.37 = 0.2072
Social relation capital: 0.54 × 0.37 = 0.1998

Among organizational factors: organizational culture and social relation capital had the highest and lowest contributions, respectively.

The main question: what kind of a model can be developed for knowledge sharing among faculty members of university?

It is considerable that individual and organizational factors demonstrated different contributions in sharing knowledge when they were inserted the model along each other, rather than when they were inserted alone.

DISCUSSION AND CONCLUSION

Knowledge sharing model was developed by combining individual and organizational factors in the form of qualitative and quantitative research. Different theories have been used to provide a comprehensive and practical model. Findings indicate that many factors can affect knowledge sharing that might be relevant to an individual or organization. The findings showed that the contribution of individual factors was greater than the contribution of organizational factors. One of Individual factors identified in this study was educational material sharing with the greatest impact on knowledge sharing. In other words, intellectual property of faculty members formed in many years of experience in teaching and research in academic setting has been evaluated as the most valuable assets of an institution. Thus, educational material sharing can use potential of faculty in the exchange of information; therefore, they can be individually efficient with regard to their expertise and experience. In addition, a clear perception of subjective norms and in fact attitudes of faculty members toward campus, sufficient knowledge of specialized disciplines and motivations of growth and excellence, tendency to exchange scientific information, sufficient

knowledge of materials as well as knowledge of interdisciplinary scientific information and attitude to maintain their knowledge as a source of power can be effective. Respect, fairness, openness, sustainability, participatory and reliable information exchange with colleagues and respect for ethical code represent trust which influence knowledge sharing. Good perception of application of expertise and efficiency in the exchange of scientific information between faculty members is the other individual factor influencing knowledge sharing in the form of knowledge self-efficiency.

The findings showed that when faculty members have the feeling that knowledge sharing with colleagues can cause a positive opinion in others, positive tendencies to knowledge sharing would improve by an increase in expertise and skills in providing valuable knowledge. The results also showed that helping others in challenging problems are interesting for people and at the same time gives them a good feeling. In addition, because getting into the problem solving is challenging and interesting and people like helping others, people find intrinsic motivation to share knowledge with others.

The faculty members also claimed that habits of people simultaneously influence their willingness to share knowledge. When people improve the habit to share their knowledge and believe that this habit is worthy of preservation, then they will unconsciously share their knowledge. Knowledge sharing Culture in educational organizations is dependent on the attitude of faculty members. If the staff or faculty members do not tend to share knowledge with other group members, it may be so difficult to extend knowledge-sharing culture by encouraging or regulatory requirements. Perception the culture of knowledge sharing may be related to individual factors. The role of educational materials and technology to support the processes of knowledge sharing is also essential. An environment with strong social trust and perception of knowledge sharing must positively direct to knowledge sharing. Therefore, a sincere and defensible interaction is required for knowledge sharing. Familiarity of faculty members with new technologies of education, even in a large geographical area, can facilitate knowledge sharing. When faculty members think they can benefit from technical and non-technical aids if they deliver valuable information, their desire and intention to share their knowledge will increase. According to Kim and Ju (2008), two main tasks of faculty members are research and teaching. As a result, they produce a large amount of educational resources during the process of research and teaching. Most often, these materials are organized and maintained by each member of faculty, rather than efficiently shared with other faculty members who teach the same courses in a same semester or next semesters. Some of these materials are of very high value; due to the lack of systematic and consistent channels to share them, however, they are not effectively collected and organized. The same educational materials are often reproduced over several years, and this repetition will be followed by wastes of time, cost and labour, both for the faculty member and prospects of educational institutions.

One type of curriculum is the instructional materials of each course including all materials and instructional subjects produced and organized by teachers to use for lectures, seminars, conferences, classroom discussions, and library resources. Educational materials also contain additional materials, such as advertising boards, news, curriculum development, course structure provided for a field and effective teaching skills. If this valuable information and knowledge is shared self-efficiently between faculty members, they can devote more time to research and interact with students and colleagues, provide high-quality courses for students by integrated educational materials. Some members believed that those with more experience in their jobs could better understand how their expertise is relevant and better be able to share their knowledge with others. Therefore, people who are more willing to share their knowledge feel that they have sufficient expertise. Thus, people with high level of expertise are more willing to offer advice. As Sun and Scott (2005) claimed, individual barriers are due to need for a sense of control and confidence. Therefore, people try to create a convenient space in the organization for them. In a convenient atmosphere, people can represent themselves, the can cause feelings of differentiation; hence, their positive feelings as a member of the organization increases. Staff beliefs usually originate in the organization in which they work. This means that economic, psychological and social conditions of employees are interwoven with the current context of the organization. In the organization level, Employees can act in a way that prevents one to deliver his information to the team. Fear of losing ownership and control of knowledge is considered as a major obstacle. In the team level,

team prevents the transmission of information to the organization level when it feels its security is threatened. They compare benefits of having knowledge in the team with transferring knowledge to the organization; if they realize that knowledge has more advantages inside the team, they will avoid delivery to the organization. Therefore, the research team cohesion should be strengthened. Team cohesion has a direct positive effect on willingness to share knowledge. Cohesion is the basis of creativity and competitiveness in the research team. To improve integration of the research team, the research should be guaranteed first and a climate is required in which team members know meaning and value of their work. Second, living and studying of members should be considered. Third, harmonious relationships are required between the members to strengthen team cohesion. In addition, trust must be established in the research team. This study revealed that interpersonal trust has a positive impact on the willingness to share knowledge. High levels of trust are a necessary condition for diffusion of knowledge. To establish trust in the university, the research team should support open culture and innovation in science, then encourage members to communicate with each other formally or informally and raise mutual perception in order to develop a mutual trust between members.

Furthermore, a shared vision is required to strengthen confidence among the faculty members. These will strengthen desire and intention to share tacit knowledge. Many faculty members believed that "altruism" had a direct positive impact on tendency for knowledge sharing; therefore, the altruistic feeling should be encouraged in universities. First, this feeling needs to defuse in life and work of each academic staff through extensive advertising. Second, management needs a comprehensive mechanism to encourage this behaviour by giving spiritual rewards or philanthropic activities. A sense of pride among members was the other idea of interviewees. The present study emphasizes that the sense of pride has a positive effect on tendency to share knowledge. Members who feel proud of the organization in which they work set organizational Goals as their goals, they highly tend to help other people and share knowledge. To foster a sense of pride in the faculty, first, coordinated interpersonal relationships are required among faculty members, then, a sense of pride, responsibility, and mission can be fostered among members. As they recommended, universities need to consider different motivates and create a proper support system to strengthen the dimensions of incentives for knowledge sharing behaviours enabled among the faculty members.

Other factors were identified as organizational factors which could facilitate or hinder knowledge sharing behaviours. One of organizational factors effective on knowledge sharing, which have the largest contribution in this study, is the organizational culture which universities and educational institutions need to provide by forming specialized groups, seminars and lectures, to provide space for growth and excellence. Knowledge-based culture, vision, clear goals and personal values in relation to knowledge are effective on encouraging and promoting social dynamics which in turn can be useful for knowledge sharing behaviour. Such a culture will lead to deeper insights in which the relevant knowledge exists, there is more active interaction between faculty members, there is mutual perception and an environment of social identity and trust dominate. The results of the study showed that senior managers are responsible to support and maintain such a culture. A culture of collaboration and teamwork, facilitation of scientific relationships between faculty members and valuation of academic information exchange can promote knowledge sharing successfully. Strengthening interdependence, willingness for cooperative participation and attendance in scientific societies and constructive communication skills are important organizational factors representing cognitive social capital. Other identified organizational factor is organizational structure which can facilitate or prevent knowledge sharing in the form of management and leadership characteristics, perceptions of organizational politics and organizational hierarchy. Expertise Communities, traditional and virtual networks and organizational support represent other organizational in the form of social capital. Knowledge sharing is vital in a knowledge-based economy, especially in interaction between teams and social evasion is considered as phenomenon which reduces knowledge sharing among team members. Social relationships among members and their interactions with outside of the academic environment refer to social relation capital represented as an organizational factor influencing knowledge sharing. Another barrier is the lack of time to share knowledge.

Many of the faculty members noted that they had very little free time, they have been only teaching and their burnout prevented such interactions; many of them knew this was because of economic problems. For some

individuals, the age difference is of utmost importance. For example, an individual may not be able to deliver his knowledge to an older or younger person; or they may not be able to communicate with others. Thus, age differences might be one of the barriers to knowledge sharing. Gender differences are also important for some people. They may not know enough about capabilities of opposite sex to be able to deliver their knowledge or they may have difficulties in communicating with the opposite sex; this also can be because of individual or organizational reasons. On the other hand, people should be able to trust the accuracy of knowledge that they receive; otherwise, they cannot use it. It may be felt that delivering knowledge to colleagues or transferring results to a knowledge database is a kind of detection. Because some types of knowledge are valuable and rare. Another problem is knowledge self-efficiency. Especially for inexperienced and young people, it may be difficult to judge which results of their work can be a valuable knowledge to others. They cannot estimate that whether their knowledge can be useful for co-workers if the knowledge is very general or some of its results can be used for a given situation. For self-efficacy of members, the university leaders should encourage members and consider awards to boost their confidence. Then, they need to introduce some of the prominent and successful members to provide a model for other members in a way that others be aware of the fact that the effort will result in success. In addition, the team should establish close relations and ask the members to conduct positive assessment; this can encourage self-efficacy.

Knowledge is Power. This famous statement is sometimes heard. Where the experts are most popular with their excellent knowledge, they will speculate it rather than try to pass their knowledge to others. Especially in situations where job security is low. Knowledge is power, and for people it seems vital. In other words, knowledge is insurance against the loss of jobs. Many faculties believe that knowledge speculation is necessary for career advancement. It is thought that knowledge sharing weakened position, power and status in the organization! Some people like to keep things for themselves, so that their co-workers and peers recognize and encourage them. Wheatley (2000) also believes that many employees voluntarily share their knowledge to understand that it is important for their jobs, or to be motivated to learn, or to tend to support a co-worker. The present findings indicate that knowledge sharing is under influence of honest behaviour, respect for others' interests, fair allocation of resources and development of transparent procedures. Social capital is a known concept including networks, valuesand achievements, which are achieved by these networks in relation to developed intellectual capitals achieved by: Composition, knowledge creation using incremental changes and development of existing knowledge and innovation or learning, exchange, social interaction and social activities. Social capital provides a positive situation for both processes and therefore helps to create intellectual capital. In order to analyse these effects on knowledge sharing, three dimensions of social capital can be distinguished here; structural: how people connect and interact -who and how they communicate with each other; relational: values are created and effective through relationships: trust, norms and permissions, obligations and expectations, identities; Cognitive: resources which provide expressions, common interpretations as well as semantic system between members, Such as language, codes and stories (Hoff and Huysman, 2009). In this study, it was clear that university has a positive effect on social relation capital; a structure which forms by roles and responsibilities for sharing knowledge and reducing structural walls will lead to trust, identity and more interactions between members. Another finding of this study was that an effective infrastructure of information and communication technology could have a positive impact on the level of structural social capital. Thus, its role in knowledge sharing involves facilitating interactions by personal blogs and websites. People who considerably connect other people and develop cooperation tend to share their knowledge at the university. University administrators can create an ideal environment for this process. Knowledge not only can be shared under pressure of organizational structure, but also it can be a result of rich social interactions. Hierarchy and Many organizational positions, The difference in the level of experience, lack of interaction, lack of social networks, a sense of ownership over intellectual property due to fear of not receiving compensation from managers and colleagues can be a barrier to knowledge sharing. Lack of leadership and management directions to understand the benefits and values of knowledge sharing can be another preventive factor. This fact is well known in the management literature that support of the senior managers is a major driver for the success of any project. Senior management support includes motivating, developing networks of knowledge and learning skills of employees (Mayo, 1998). Experimental evidence shows that if employees know senior management supports activities conducted in order to support knowledge management, they will increase their efforts for knowledge sharing.According to the presented model, if

these factors are considered in planning and proceedings of the universities, the barriers are eliminated and required facilities are provided, it can be expected that knowledge-sharing behaviour will be improved between members of faculties as a model for developing and managing knowledge resources of universities.

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Table 1: optimality of knowledge-sharing status.

	Optimality	No. References	References %
1	Optimal	1	4
2	Quite optimal	3	12
3	Moderate	5	20
4	Quite moderate	8	32
5	Weak	8	32

Table 2: Descriptive indicators related to knowledge sharing.

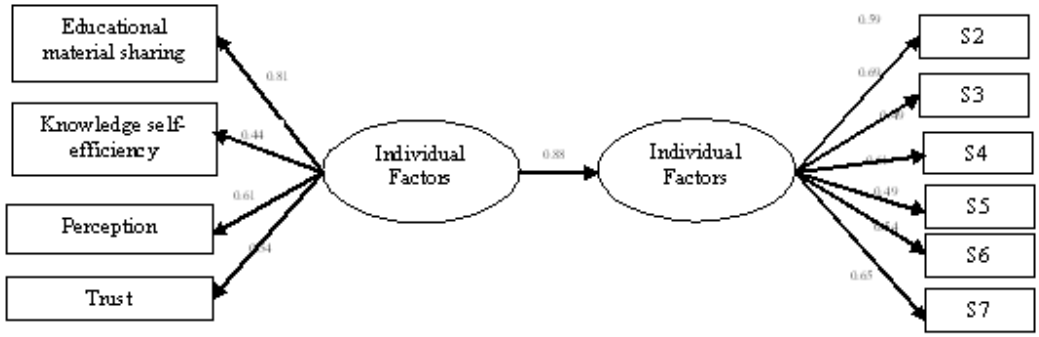
	Items	No.	Average	Standard deviation	Mean standard error
1	Sharing knowledge and experience	326	3.9632	1.10043	0.06095
2	Responding to specialized questions	326	3.8742	1.07538	0.05956
3	Informing scientific projects	324	3.4352	0.98226	0.05457
4	Delivering new information and knowledge	323	3.4923	1.01958	0.05673
5	Interacting in learning	322	3.5497	1.07028	0.05964
6	Helping to acquire skills	321	3.6293	1.10239	0.06153
7	Delivering ideas to coworkers	319	3.5361	1.04811	0.05863
-	Sharing knowledge (variable)	326	3.659	0.6917	0.036

Table 3: Open codes; facilitating ways of knowledge sharing.

	Components	References		Components	References
1	Specialized problem-solving sessions	5	10	Qualitative growth of information sources	3
2	Seminars	8	11	Intra-organizational publications	3
3	University website	5	12	Management support policies	20
4	Articles	6	13	Excellent encouragements	8
5	Email	2	14	Scientific recognition of coworkers	4
6	Motivation	4	15	IT	7
7	Scientific conference	5	16	Organizational structure	4
8	Equipped libraries	4			
9	Internet speed	4			

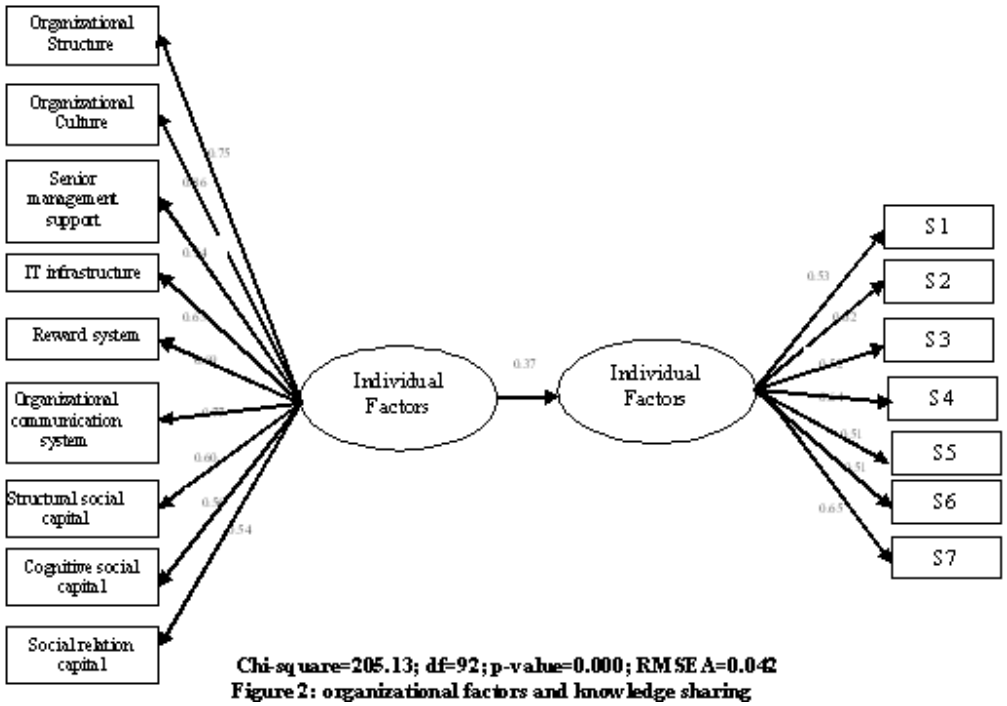
Table 4: Open codes; barriers to knowledge sharing.

	Components	References		Components	References
1	Mistrust	8	7	Weak digital facilities	8
2	Unfamiliarity to capabilities	8	8	Lack of sufficient knowledge of coworkers	3
3	Fear of Release	5	9	Poor sources of information	2
4	Lack of interest	6	10	Mismatch of organizational fields	5
5	Insufficient time	15	11	Weak support policies of Directors	7
6	Lack of social interaction	7	12	The lack of great encouragement	8



Chi-square=96.93; df=43; p-value=0.000; RMSEA=0.032

Figure 1: individual factors and knowledge sharing



Chi-square=205.13; df=92; p-value=0.000; RMSEA=0.042

Figure 2: organizational factors and knowledge sharing

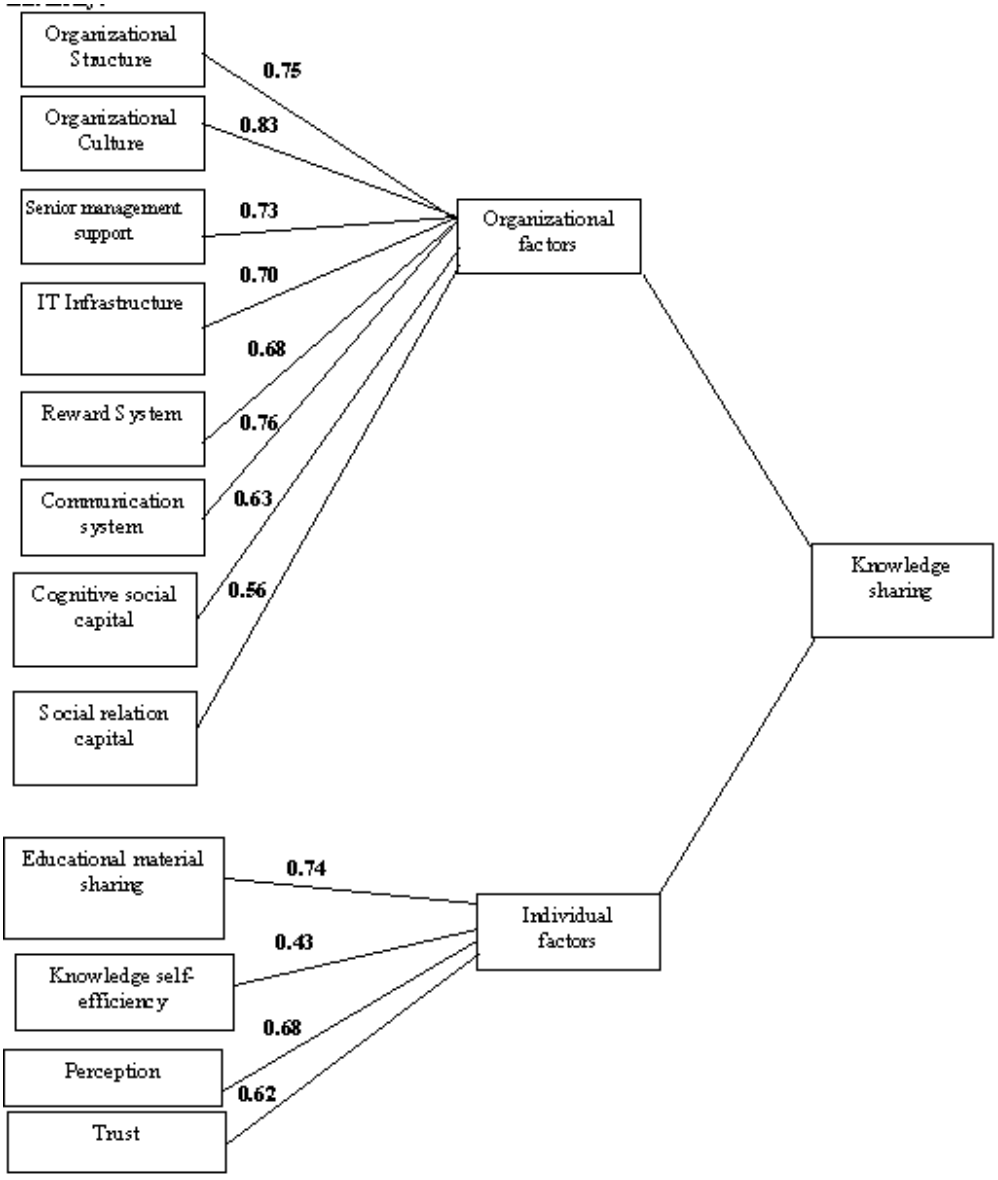


Figure 3: knowledge sharing model based on individual and organizational factors and their contribution

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RESEARCH ARTICLE

The Relationship between Emotional Intelligence and Intellectual Capital in the Employees of the Department of Physical Education.

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ABSTRACT

Emotional capabilities and competencies are one of the factors which are decisive and influencing on the quality of social relations and they have prominent effects in controlling emotions, feelings and ideas which cause the increase in the intellectual capital. Therefore the purpose of this study was to investigate the relationship between emotional intelligence and intellectual capital in the employees of physical education department. Research participants were 305 of employees of the department of physical education of 3 Northern provinces of the country that were selected through convenience sampling and by separation from the employees of three provinces. The measuring tools of the research consisted of the questionnaire of individual characteristics, Shring's emotional intelligence questionnaire (1994) and Bontis's intellectual capital questionnaire (1998). Kendall's correlation coefficient was used to analyze the data in a meaningful level of α <05/0. The results showed that there is a significant positive relationship between the emotional intelligence and intellectual capital and its components (human capital, structural capital and customer capital). This means that with the increase in emotional intelligence, human capital, structural capital, customer capital and intellectual capital of employees increases. Intellectual capital is one of the intangible assets of organizations that have a significant impact on the performance of the organization, thus, through proper planning in the workplace and providing educational conditions, in a way that employees could acquire competency in controlling emotions, feelings and thoughts of others and themselves, emotional intelligence increases and emotional intelligence is one of the most influential psychological constructs for the enhancement of the intellectual capital of employees.

Keywords: Emotional intelligence, human capital, structural capital, customer capital, intellectual capital

INTRODUCTION

Intellectual capital is an issue that theoretically has been raised at the global level in the past few years. But since it is considered as a valuable resource for countries and organizations, the rate of its growth and development is rapidly becoming an indicator in the development process of the countries. On the other hand, this intangible resource has been proposed as one of the most valuable and crucial capital resources of companies in the growth of entrepreneurship. According to Shabet (2008) intellectual capital includes: the economic value of three categories of intangible organizational assets (human capital, structural capital and customer capital). Human capital refers to human resources and knowledge, information, experiences, skills, creativity and innovation within the organization. Structural capital refers to hardware and software systems of integrated distributed networks of the organization and customer capital refers to corporate sponsors, including customers within and outside of the organization. In the past few decades, the production of many goods and services has undergone huge transformation. Moreover, in today's knowledge-based economy, success of organizations depends on the ability of the management of intangible assets such as intellectual capital of employees. According to Marr et al (2004) the reasons of organizations attention towards the management of intellectual capital are as follows:

1. Assisting the organization in order to adjust strategies.
2. Evaluation of the implementation of strategies.
3. Contribute to the decisions related to the expansion and diversification of the activities of the organization.
4. Using the results of measuring intellectual capital as a basis for compensation of services.
5. Deliverance of these assets to external stakeholders of the organizations.

In today's world, the main economic resources are no longer capitals, natural resources, labor, and etc., but the main economic resources will be knowledge. After the twentieth century which was the industrial economy century, the twenty-first century is the century of information and knowledge economy. In the industrial economy, economic wealth creation factors were some physical and tangible assets such as land, labor, money, etc., and from the combination of these economic factors, the wealth was produced. In this economy, the use of knowledge, as a factor of production, had little importance, but in the knowledge economy, knowledge or intellectual capital as finds a higher priority as a factor of wealth production to provide better service in comparison with other tangible and physical assets. In the knowledge economy, unlike the industrial economy, intellectual assets and especially human capital, are considered among the most important assets of the organization and the potential success of organizations rests on their intellectual ability. So the way of management of intellectual capital in organizations and their role in the acquisition of competitive advantage can play a significant role in promoting organization's objectives (Bathayi, 1385). Research literature carried out in this area have emphasized on the positive relationship between intellectual capital with performance (such as business performance of the organization), (Shojaei and Baghbanyan, 1388; Fatres and Beigi 1389, Wang and Chang, 2005), and intellectual capital with financial performance (Sinai, 1390; Zhang, Zhu and Kong, 2006, Chung and Sung, 2007) in different firms and organizations. Therefore, nowadays the development and management of intellectual capital has become a significant requirement at the national level and in the business arena and by moving towards a knowledge-based economy, it has led to a change in the dominant paradigm of the industrial economy. In a way that one can witness the emergence of a knowledge-based economy, which is based on intellectual capital (Khodabakhsh, 1391). So study of the intellectual capital and related variables in employees of different organizations and to improve organizational efficiency is important.

Emotional intelligence can be considered as one of the most important and influencing variables related to intellectual capital, in fact, emotional intelligence is a kind of intelligence that consists of the knowledge of one's own feelings and using it to make good decisions in life. Emotional intelligence is a factor for the management of anxiety and controlling stress, motivation, hope and optimism in the face of obstacles to reach the goal. Proper use of excitements (the power of controlling emotions) is an ability which relies on the sense of self awareness and refers to the capacity of individuals to relieve themselves, remove anxiety, depression or common boredom. Also emotional intelligence is effective in self-motivation, self-mastery, delay in immediate satisfaction of needs and desires,

controlling emotions and being at good mental state (Shahtalebi, 1386). The importance of emotional intelligence becomes clear when individuals understand that their emotions have great influence on their decisions and lives. The intensity and variety of emotions which appear during the day for a person are surprising (Ibrahim, 1390). Emotions are always associated with humans whether we accept or deny their existence. Feelings, decisions, and thoughts of men are usually affected by emotions, however, they are less able to identify and use them to their advantage. Emotional intelligence helps people to easily accept themselves and others, to seek ways to easily deal with hard feeling (Nordin 2012). Those who have high level of emotional intelligence can successfully control the damaging and harmful effects of emotions and they can perfectly manage their relationships (Ganji, 1384). But by considering that emotional intelligence has a fundamental role in the recognition of emotions, thoughts and feelings of self and others and leads to attitudes based on ethics and social conscience (Ibrahim, 1385), it would be expected that it can have association with the intellectual capital which is based on the creation of solutions and new ideas to solve problems and improve performance, creating effective communication with colleagues and understanding interpersonal relationships within the organization, innovation in effective communication with customers and understanding their emotions and etc., but the research literature in this area is merely limited to related researches which have conducted on this area.

For example Shahtalebi (1386) in his study on emotional intelligence and learning styles over 320 undergraduate, graduate and Ph.D. students, concluded that only 3 components (interpersonal relations, nervousness and happiness control) are compatible with learning styles and there is no connection between other components of emotional intelligence with components of learning styles. In a study conducted by Kashani and colleagues (2012) they did not found a significant relationship between emotional intelligence and academic achievement, but the results of the researches of Veneta et al (2005) show that emotional intelligence has positive relationship with academic achievement, life satisfaction, coping and less behavioral disorders. According to the raised issues and the fact that no study so far has examined the relationship between intellectual capital and emotional intelligence and on the other hand given that the Youth and Sports organization is the highest reference to address issues related to youth and sports in Iran and is obliged to prepare and compile national comprehensive program for organizing affairs of youth of country with regard to the basic status, roles and missions of the various governmental and non-governmental organizations concerned with youth and focus on the needs of young people in the cultural, social, political, business, scientific, recreational and educational areas. And this matter primarily depends on the intellectual capital of the organization, particularly the level of human capital of the organization, so study and identification of the factors influencing the level of intellectual capital of Youth and Sports organization is theoretically essential in strengthening self-sufficiency and improving the relationship between individual and social and in practical terms, by increasing employee productivity it can solve or compensate different problems such as financial problems in organizations, therefore the purpose of this study is to investigate the relationship between the emotional intelligence and intellectual capital and its subscales (human capital, structural capital and customer capital) in the employees of physical education department in three northern provinces (province of Golestan, Mazandaran, Gilan).

METHODOLOGY

The present study is descriptive correlational that its data were collected in form of field. The statistical population consisted of all employees in departments of physical education in the three Northern provinces that 305 of them were selected as sample and by using the method of convenient sampling and by the separation of the three provinces (Golestan province 100 people, Mazandaran province 105 people and Gilan province 100 people) and research questionnaires were distributed among them and finally all returned 305 questionnaires were identified as usable. The measuring tools of the research consisted of the questionnaire of individual characteristics, Shring's emotional intelligence questionnaire (1994) and Bontis's intellectual capital questionnaire (1998).Personal attributes questionnaire: This questionnaire was designed by the researcher and information such as age, gender, education and work experience of staff were obtained through it.Shring's emotional intelligence questionnaire (1994): This measure included 33-questions which were set according to Likert's five-point scale and components of emotional intelligence, which are estimated by this scale include: self-awareness, self-regulation, spontaneity, empathy and

social skills that emotional intelligence scores of an individual is the sum of the its components. This scale was normalized by Mansoori (1380) in Iran.

Bontis's intellectual capital questionnaire (1998): This scale essentially contains 52 items that due to the similarity of some of the questions it has been reduced to 42 questions, and evaluates the three components of human capital, structural capital and relational capital (customer). This questionnaire has been used frequently by various researchers in Iran and its validity is verified. In this research, to determine the initial validity, questionnaires have been distributed among 10 faculty members and research scholars specialized in this field that suggestions have been included in final version, and to determine the reliability of the research a pilot study was conducted on a sample of 30 people. Cronbach's alpha coefficient for the emotional intelligence scale was 0/91 and for intellectual capital it was 0/87 that with this value at hand the coefficient of internal consistency of the questionnaire was approved. According to the nature of research, descriptive statistics were used to describe, classify and adjust the raw scores by calculating the mean, standard deviation, and drawing diagrams and in the section of inferential statistics to determine the normality of the data, the KS test was applied and Kendall's nonparametric correlation coefficient was used to test the hypotheses. For data analysis SPSS statistical software package version 21 was used. Significance level for all hypotheses was considered as α=0/05.

RESULTS

Demographic characteristics of the study included: gender (70 females and 235 males), age (old120 people, under 30 years, 125 between 30 and 40 years and 60 older than 40 years), education (35 diploma, 40 associate degree, 195 undergraduate and 35 graduate students) and work experience (100 people less than 5 years, 106 people between 6 to 10 years, 99 people more than 10 years). By describing intellectual capital of employees, it was specified that human capital has allocated greater average to itself as compared to structural capital and customer capital (see Table 1).

Research results showed that the relationship between emotional intelligence and human capital in employees is significant (Kendall's correlation coefficient for this relationship was 0/35 and ($p<0/05$)The relationship between emotional intelligence and customer capital in employees is significant (Kendall's correlation coefficient for this relationship was 0/42 and ($p<0/05$).The relationship between emotional intelligence and structural capital in employees is significant (Kendall's correlation coefficient for this relationship was 0/43 and ($p<0/05$).And ultimately the relationship between emotional intelligence and intellectual capital in employees is significant (Kendall's correlation coefficient for this relationship was 0/51 and ($p<0/05$).

DISCUSSION

By examining research variables and results it was specified that there is a significant positive relationship between the emotional intelligence and intellectual capital and its three sub-scales (human capital, structural capital and customer capital). Also results showed that there is significantly positive relationship between emotional intelligence and the intellectual capital of the employees of physical education department i.e. with the increase in the emotional intelligence of employees, the amount of intellectual capital and its components will be enhanced. By examining the relationship between emotional intelligence and human capital, and observing a significant positive relationship between them it is determined that with the increase in the emotional intelligence the amount of human capital increases. In other words, if the emotional intelligence of employees gets higher the amount of knowledge, skills, information, experiences, creativity and innovation will also get higher. Also human capital allocates the highest average to itself as compared to other components of intellectual capital that this result was consistent with results of many studies, such as the researches of Nazem (1390), Fatres and Beigi (1389), and Shojaei and Baghbanyan (1388). Human capital, which is also referred to as human resources capital, is the backbone of intellectual capital and a key element in an organization's entrepreneurship (Boujelbene and Affes, 2011), and contains all the intellectual assets of organizations, such as knowledge, skills and other abilities of employees that enables them to solve problems related

to organization and the individuals associated with the organization (Khan, 2011), this type of capital which is referred to as the most important measure of intellectual capital, all the knowledge available at individuals encompass the organizations and shows the ability of the organization to find the best solutions through knowledge of employees (Bontis, 1998). In this study, the level of human capital in physical education department staff, despite being higher than other capitals was about average that it should attract the attention of the relevant authorities for the use of variables involved with it (such as emotional intelligence) in order to improve it. The results of this study indicate that employees who have high level of competency, move with scheduling and planning towards enhancing the purposes of organization, develop and maintain internal relationships among the various groups, creating new ideas, praising the ongoing, long and lasting relationships with people related to the organization, high vulnerability, understanding others' emotions and the atmosphere of the workplace are in fact, employees who have high emotional intelligence and human capital, so emotional intelligence can be used as a shortcut in this area and by raising it, provide the basis for learning, knowledge transfer and enhancing human capital, along with high performance in the organization of youth and sports. Presence of a significant positive relationship between customer capital and emotional intelligence of employees of physical education department was among the other results of this research. Similar studies in this regard were not found but results regarding the priority of intellectual capital were inconsistent with the research of Fatres and Beigi (1389), and Shojaei, and Baghbanyan (1388) and they were consistent with the research results of Nazem (1390). Regarding the relationship between emotional intelligence and customer capital, it can be said that if the employees have higher emotional intelligence, customer orientation (more communication with youth) of organization increases. That means that in this way they will be able to gain existing knowledge in relationships with young people and increase the necessary information for attracting and retaining young people and meet their expectations. When the employees concern about the other intentions and understand better the demands of a young man, they will be able to clearly and effectively communicate with them and they can easily cope with them and also they can more effectively solve their conflicts and problems and pay attention to their emotions and show or explain their intentions or feelings easily to them and finally they will be able to satisfy their young people. Also results of the study showed that there is a significant positive relationship between emotional intelligence and structural capital of Physical Education Department staff. In this regard, no similar research was found. In fact, structural capital, includes all inhumane knowledge reverses such as databases, organizational charts, operating procedures of processes, strategies, operational plans and whatever which worth more than its material value (Halim, 2010) and this matter will not happen in the Physical Education Department, unless with the employees with the knowledge and new and creative ideas and high emotional intelligence at all levels of the organization. As a result, if an employee is able to recognize feelings and emotions in a particular moment and has a proper understanding of his capabilities, so that he will be better able to choose the best decision given the circumstances. On the other hand the staff with an appropriate level of spontaneity will be able to take steps towards achieving the goals and programs of their own and organization and easily can identify their strengths and weaknesses and, therefore, meet their needs and in addition to self-motivation they can play an important role in creating morale and motivation in other employees in order to achieve the lofty goals of the Youth and Sports organization. Those with a high level of motivation and arousal would be able to guide people towards their own goals and plans because motivation is the intrinsic driving force in human beings. The spontaneity has been regarded as a guidance and facilitator of emotions to achieve the goals and the structural capital (Egret and Klipa, 2012). Eventually findings of this study suggest that there is a positive and significant relationship between emotional intelligence and intellectual capital of physical education department employee. The findings of the present study may be consistent with the result of the researches of Shahtalebi (1391), Kashani and colleagues (2012), Veneta et al (2005). Given the lack of research in this regard, no inconsistent research was found in this area. According to the results of present study the higher the emotional intelligence of employees is their intellectual capital will be higher because people will have confidence in their ability, they will accept their inabilities and shortcomings and they will understand others effects on them in the emotional state and they will be able to constantly create new ideas and greatly reduce the time of solving the problems of the customers, also they can communicate regularly with the youth and clients to understand what they want, the can even identify and understand the needs and demands of youth that all of these means the high intellectual capital of an organization. Given that the level of intellectual capital and emotional intelligence of employees of physical education department was moderate, it can be said that

emotional intelligence has a great importance at work and people with low emotional intelligence, although with a high IQ at any position will be in trouble, these people are inflexible and hard, so often they fail in their work, to avoid repeated failure and despair, emotional intelligence can be nurtured, because these characteristics are acquisitive and can be changed.

CONCLUSION

Improvement of intellectual capital in organizations needs a comprehensive program that is designed to enhance organizational productivity, but according to the survey results, enhancing emotional intelligence of employees as a mental structure could provide the basis for the enhancement of intellectual capital in organizations. Since the managers and policy-makers of Youth and Sports organizations are seeking ways to achieve their goals and in this way, the intellectual capital is the main and effective component of an organization, they can according to the findings of this study, increase the intellectual capital in their organizations and enhance emotional intelligence of employees with the necessary training, so in this way they can increase the level of knowledge, attitudes and innovation of employees, improving communications and interactions within and outside the organization and increase employee's understanding, leading to the identification of the needs of individuals related to the organization. And finally all of these are examples of intellectual capital which will increase the productivity and performance of employees. However, due to limited research in this area, these results should be interpreted with caution and more detailed studies are required in this area, but what was evident in this study, was the presence of positive relationship between emotional intelligence and intellectual capital, and its subscales in the staff of the physical education department.

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Table 1: Description of variables of intellectual capital among participant

No.	Un answered	Domain	Standard Deviation	Minim-um	Maxi-mum	Mode	Median	Mean	
305	0	4	0/77	1	5	3	3	**3/03**	**Human Capital**
305	0	4	0/85	1	5	3	3	**2/75**	**Customer Capital**
305	0	4	0/85	1	5	3	3	**2/75**	**Structural Capital**
305	0	4	0/70	1	5	3	3	**2/86**	**Intellectual Capital**

Table 2: The one-sample Kolmogorov - Smirnov test for study variables

Number	Significance	Test Statistic	Standard Deviation	Mean	Variable
305	<0/010	0/301	0/70	2/81	**Intellectual Capital**
305	<0/010	0/275	0/66	3/09	**Emotional Intelligence**

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RESEARCH ARTICLE

Daily Operation Management of Distribution Network Considering Fuel Cell Units for Minimizing Cost, Power loss, Emission and Voltage Stability.

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ABSTRACT

Nowadays issues such as advancement of technology in the field of small manufacturing units, reduction of environmental pollution, problems in the construction of new transmission lines and also high efficiency of small manufacturing resources have caused consumers and distribution companies be encouraged to use the products under the title of distributed productions which mainly are connected to the distribution networks and don't need to transmission lines. Fuel cells have been considered more in recent years. One of the major issues of distribution networks is the optimal utilization management that the fuel cells can influence on it. Since the optimal utilization of the distribution networks is a nonlinear optimization problem, an optimal solution can be obtained via an evolutionary algorithm that we will use the jumping frog's evolutionary algorithm.

Keywords: Distributed productions, Distribution network and voltage stability.

INTRODUCTION

Distributed productions will play a significant role in electrical power systems in future. Distributed productions with the product range of 10 MW are connected to the distribution networks or load. The resources of distributed productions include fuel cells, photovoltaic, windy turbines, geothermal energy, micro-turbines and etc. The

connection of distributed productions to the distribution networks significantly effect on the load distribution, frequency and the voltage of equipment. Distribution networks generally have a radial structure and a unidirectional enumeration power. Some of the advantages of distributed productions are as follows:

-Improving the quality and voltage: installing of the distributed productions on the different buses of distribution networks improves the voltage level of the system.
-Reduction of losses: improving the voltage level decreases the ohm losses.
-Release the capacity of transmission and distribution networks: placing the distributed productions cause to reducing the load on the transmitted networks and each distributed productions provides the load demand in its vicinity, and so the capacity of transmission lines will be decrease.
-Improving the system reliability: distributed productions continue their activities even with the errors which occur in the system after becoming an island.
-Saving the energy costs: by injecting the power from local areas in contrast with the traditional structure of the distribution network which were fed only from the original post, the energy cost will be saved.

Since a relatively large number of studies in the field of distributed productions and their utilization have been done. As an example, in [1] it is used from the optimal utilization of distributed productions to voltage maintenance in optimum level in distribution feeders; in [2] with the use of optimal utilization of distributed productions the voltage coordination in parts of the distribution system is discussed. Also in [3] a way for controlling the voltage and reactive power in the distributed systems in the presence of distributed productions is discussed. In the reference [4] the authors use the evolutionary algorithms for daily and multi-objective utilizations of fuel cells in the distribution networks. Also the studies were conducted in the field of voltage stability in distribution systems, such as: voltage stability analysis in the distributed systems with the radial structure in [5] and also reconfiguration of distribution feeder planning is for improving the voltage stability in radial systems is presented in [6].

METHODOLOGY

Formulation of the problem

Basis of utilization issues of planning the electric power transmission distributed system from the distribution transformers to the consumers are with the aim of reducing the losses and increasing the efficiency and meeting the equality and inequality constraints. Recently, objectives such as VSI voltage stability have been reviewed in this issue. Every system or engineering element is expressed with a set of quantities that some of them appear as a set of variables in the design process under the title of design or decision variables. The variables are shown with the name of (i=1, 2, 3, …, n) and the design variables sets are presented as $\mathbf{X}=\begin{bmatrix} x_1 \\ x_2 \\ \dots \\ x_n \end{bmatrix}$.

Before stating the definition of objective functions and constraints, it is necessary that the control variable is define in the utilization management issue of daily units fuel cells in the distribution network. The control variable in the management utilization of daily fuel cell units in the distribution network is extensive and for every network it is different according to the network requirements and also the specific geographical situation of the network. In this paper it is tried that a fairly comprehensive control variable provided on the suitable testing network.control variable the issue of the management utilization of daily fuel cell units in the distribution network

$$\mathbf{X} = [\overline{PG} \quad \overline{Tap} \quad \overline{Q_C}]$$

That in the above equation:

X: Vector Control

$\overline{PG}$: Active power of fuel cell units

$\overline{Tap}$: Vector control for pulse transformers status

$\overline{Q_C}$: Reactive power of Parallel capacitor units

Then each of the mentioned subsets are defined as follows.

$$\overline{PG} = [\overline{P_{g1}} \quad \overline{P_{g2}} \quad \ldots \quad \overline{P_{g\ NG}}]$$

$$\overline{P_{gk}} = [P_{gk}^{\ 1} \quad P_{gk}^{\ 2} \quad \ldots \quad P_{gk}^{\ 24}]$$

That in the above equation, $P_{g\ k}^{\ t}$ determines the status of output active power of k unit in the time t, and NG is the number of fuel cell units in the network structure.

$$\overline{Tap} = [\overline{Tap_1} \quad \overline{Tap_2} \quad \ldots \quad \overline{Tap_{NT}}]$$

$$\overline{Tap_k} = [Tap_k^{\ 1} \quad Tap_k^{\ 2} \quad \ldots \quad Tap_k^{\ 24}]$$

That in the above equation, $Tap_k^{\ t}$ determines the status of pulse transformer k in the time t, and NT is the number of transformers in the network structure.

$$\overline{Q_C} = [\overline{Q_{C1}} \quad \overline{Q_{C2}} \quad \ldots \quad \overline{Q_{C\ NC}}]$$

$$\overline{Q_{C\ k}} = [Q_{C\ k}^{\ 1} \quad Q_{C\ k}^{\ 2} \quad \ldots \quad Q_{C\ k}^{\ 24}]$$

That in the above equation, $Q_{C\ k}^{\ t}$ determines the status of reactive power of output capacitors k in the time t, and NC is the number of capacitors in the network structure.

Objective functions

In the usual problems the goal is to obtain a suitable plan among the existing plans. While in the optimization problems, accepting a suitable plan is not enough, rather, the goal is to optimization the selection of the plan among the other plans. Therefore, a criterion should be determined for comparing the acceptable plans and selection of the best which is defined as a function of control variables (design variables) that are called fitness function, criterion function or objective function.

-Reducing the cost of utilization

It might be said that the cost is an important goal in today's economical world. So in the mentioned issue the cost of utilization is considered as a specific goal. The cost of utilization in the issue of the management utilization of daily fuel cell units in the distribution network is formulated as follows:

$$Cost(X) = \sum_{t=1}^{24} \delta t \times Cost^t = \sum_{t=1}^{24} \delta t \times (Cost_{FC}^t + Cost_{Substation}^t)$$

That in the above equation:

$Cost_{FC}^{t}$: The cost of electric power of the fuel cell units in the time t

$Cost_{Substation}^{t}$ The cost of post electric power in the time t

Reducing electrical losses

According to the conducted studies, the bulk power system losses are related to the distribution network, therefore, solutions must be provided in order to reduce the distribution losses. Placement issue of the management utilization of daily fuel cell units in the distribution network with the aim of reducing the electrical power loss is defined as follows:

$$P_{Loss}(X) = \sum_{t=1}^{24} \delta t \times \sum_{k=1}^{N_{brch}} \left(R_k \times \left| I_k^t \right|^2 \right)$$

That in the above equation:

I_k^t : The transmission current from the k branch in time t

R_k : The Ohm resistance of the k branch

- Voltage stability

To evaluate the voltage stability is better to start with an example. Regarding this figure we have:

$$I_{(I,J)} = \frac{V_{(I)} - V_{(J)}}{R_{(I,J)} + jX_{(I,J)}} \quad (1)$$

$$P_{(J)} + jQ_{(J)} = V_{(J)} I_{(I,J)}^{*} \quad (2)$$

With the combination of (1) and (2) equation we have:

$$\left|V_{(J)}\right|^4 + b\left|V_{(J)}\right|^2 + c = 0 \quad (3)$$

In the above equation we have:

$$b = 2\left(R_{(I,J)}P_{(J)} + X_{(I,J)}Q_{(J)}\right) - \left|V_{(I)}\right|^2 \quad (4)$$

$$c = \left\{P_{(J)}^2 + Q_{(J)}^2\right\}\left\{R_{(I,J)}^2 + X_{(I,J)}^2\right\} \quad (5)$$

By solving the quadratic equation of relationship equation 3, we have four answers as follows:

(6)

1) $\sqrt{\frac{-b-\sqrt{b^2-4c}}{2}}$

2) $\sqrt{\frac{-b+\sqrt{b^2-4c}}{2}}$

3) $-\sqrt{\frac{-b-\sqrt{b^2-4c}}{2}}$

4) $-\sqrt{\frac{-b+\sqrt{b^2-4c}}{2}}$

In the above equations, all values are in per unit. The voltage value of $|V_{(J)}|$ will be positive. So the answers 3 and 4 in equation number 6 are acceptable. Also the amount of b is usually negative, because the amount of $|V_{(I)}|^2$ is very bigger than $2\left(R_{(I,J)}P_{(J)}+X_{(I,J)}Q_{(J)}\right)$. The amount of $4c$ is very smaller than b^2, so the amount of b^2-4c is positive and close to b^2. According to the mentioned statements, the amount of the answer 2 in the equation number 6 is close to zero, so this answer is acceptable too. The answer 1 from the equation number 6 has a positive and reasonable amount, therefore we have:

(7)

$$|V_{(J)}|=\sqrt{\frac{-b-\sqrt{b^2-4c}}{2}}$$

According to the above equation we have:

(8)

$$b^2-4c\geq 0$$

With the placement of 4 and 5 equations in the equation number 8 we will have:

(9)

$$|V_{(I)}|^4-4\left\{X_{(I,J)}P_{(J)}-R_{(I,J)}Q_{(J)}\right\}^2-4\left\{R_{(I,J)}P_{(J)}+X_{(I,J)}Q_{(J)}\right\}|V_{(I)}|^2\geq 0$$

The equation 9 is introduced as a voltage stability index. That is as follow:

(10)

$$VSI_J=|V_{(I)}|^4-4\left\{X_{(I,J)}P_{(J)}-R_{(I,J)}Q_{(J)}\right\}^2-4\left\{R_{(I,J)}P_{(J)}+X_{(I,J)}Q_{(J)}\right\}|V_{(I)}|^2$$

$$VSI_J\geq 0 \quad J=2,3,...,N_{Bus}$$

So for each bus, a voltage stability index is achieved. The larger the index, the bus voltage is more stable, and if this index be negative, the bus voltage is unstable. In this paper, the inverse of the smallest index as the objective function is as follows:

(11)

$$VSI_{Min} = \min\left\{VSI_2 \quad VSI_3 \quad \ldots \quad VSI_{N_{Buss}}\right\}$$

$$VSI(X) = 1/VSI_{Min}$$

By improving the smallest index of the bus voltage stability in the network, the voltage stability of the whole network will improve.

Frog algorithm

Frog algorithm was proposed in 2006 by Eussuf [7]. This algorithm is inspired by the random search of frogs in a pond (search space) which were looking for food. Each frog is a solution in search space and its position to the food represents the fitness (objective function value). In this algorithm, each frog tries to reach to the food or be close to it, so it tries to get closer to the assumed target by comparing its situation with the other frogs and jumping into the new situations. In this paper frog algorithm is used as an optimization tool.

RESULTS

Simulation results

To investigate the function of the method of the study, it is used from IEEE standard distribution network and then we investigate the issue of the management utilization of daily fuel cell units in the distribution network in single-objective and multi-objective form. All the simulations are done by MATLAB.

Testing network

This network is a hypothetical system that includes 4 feeders, 2 transformer and 69 buses. The nominal voltage of the system is 11.4 kV. Additional information of the system is in [8] references. Single-line diagram of the system is shown in Figure 1.

Optimization of the losses in a single –objective form

In this case the problem solving is done separately in order to optimization of the electrical losses. Simulation results involving the active power output of the fuel cell units, power of the output reactive of parallel capacitor units and the status of pulse transformers are shown in the following table in order to optimize the electrical losses.

The optimal losses over the 24 hours are 2363.9 KWh. Also the active power output of the fuel cell units, power of the output reactive of parallel capacitor units and the status of pulse transformers for reducing the utilization costs are shown in the above tables. Then the optimization is done according to the objective function of voltage stability index. The voltage Stability index is 9304347.82.as it can be seen it is a big index. In other words, the network has a good stability margin. For this reason in the multi-objective simulation the index is being canceled.Evaluation of the problem-solving of the management utilization of daily fuel cell units in the distribution network in the multi-objective form:In this case, the electrical losses, utilization costs and pollution are optimized simultaneously. In the management utilization of daily fuel cell units in the distribution network, cases of electrical losses, utilization costs and pollution are in conflict with each other. So a set of prevailing answers are obtained in the optimization process as shown in the figure3.

In this case, the network designer has several options to choose, so the best compromise[1] of the $w_1=w_2= w_3=0.5$ is achieved. The bases of the using multi-objective methods especially in the optimal light method of increasing the suitable and optimal options are for choosing a suitable plan among the other plans. In a way that the values of the objective functions in the selected plan is as a compromise between the values of the objective function which is obtained from the single-objective optimization method. In this problem the values of the objective function in the best compromise is in a way that the amount of losses was 2444.758 kWh/day, too, also the amount of utilization costs was 3924.413 $/day. Finally, the amount of electrical losses is 164394.6kWh/day. As it can be seen the amount of the objective function in the best compromise, is close to the optimal values, and also are as a compromise between the objective function which are in conflict with each other. As a result, the selected plan is in a way that optimizes all the three objective functions equally.

CONCLUSION

With the development of distributed network connectivity to the distributed networks, it is necessary to do studies in the field of these products' effects on the performance of power systems. Among The different types of distributed productions, it is expected that the fuel cells in near future with regarding the cell lifetime improvements and reducing the construction costs will be used extensively. The first part of the power systems that can be affected by the productions, are the distributing networks. One of the important issues and programs in this part is the utilization management of distributed systems. In this paper it is tried to provide the impact of fuel cells on the optimal utilization management and also it is tried to offer some ways to improve this issue with the presence of these productions with the tools and necessary algorithms.

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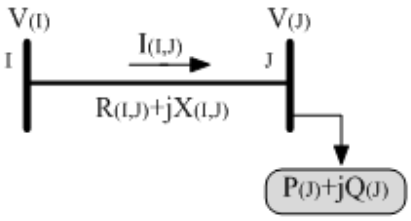

Figure 1: Electrical equivalent of distribution Network

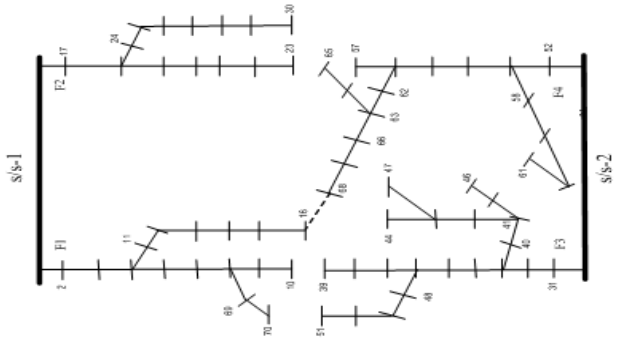

Figure 2: Diagram of the 69-bus distribution system

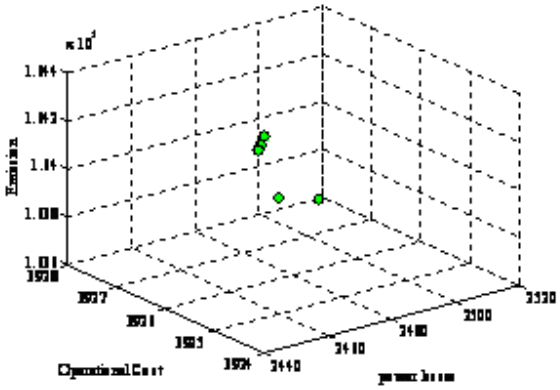

Figure 3: a set Optimal light spots

Table 1: Information on fuel cell units

No. of FCPP	1	2	3	4	5	6	7	8
Capacity, kW	250	500	250	250	250	250	500	250
Location	9	15	22	28	37	43	52	57

Table2: The active power output of the fuel cell units to optimizing the electrical losses

Time (h)	Output Active Power (kW)							
	FC1	FC2	FC3	FC4	FC5	FC6	FC7	FC8
1	50	50	50	50	50	250	500	50
2	250	50	50	50	250	50	500	50
3	250	500	50	50	250	250	500	250
4	50	50	50	250	250	50	50	250
5	250	50	250	250	250	50	50	250
6	50	50	250	50	250	250	50	50
7	50	500	250	250	50	50	500	250
8	50	500	50	250	50	50	500	50
9	250	500	250	250	50	50	500	50
10	50	50	50	250	250	250	500	250
11	250	500	50	250	50	250	50	250
12	50	500	250	250	250	50	500	250
13	50	500	250	250	50	50	500	50
14	250	50	250	250	50	50	500	250
15	50	500	250	50	50	250	500	250
16	250	500	250	250	50	250	500	250
17	250	500	50	250	50	50	500	250
18	250	500	50	250	250	250	500	250
19	250	277.9326	250	50	50	50	500	50
20	50	50	250	50	50.68763	250	50	250
21	250	50	250	50	50	250	500	250
22	250	50	250	250	250	250	500	250
23	239.1625	50	250	250	250	250	50	250

Table 3: Power of the output reactive of parallel capacitor units installed in the network to optimizing the electrical losses

Time (h)	Output Reactive Power (kVAr)											
	CAP1	CAP2	CAP3	CAP4	CAP5	CAP6	CAP7	CAP8	CAP9	CAP10	CAP11	CAP12
1	20	20	20	20	1000	20	20	20	20	20	1000	1000
2	20	1000	20	1000	20	20	1000	20	20	1000	20	20
3	20	20	20	20	20	20	700	20	20	20	20	20
4	20	20	20	20	20	20	20	20	1000	20	1000	20
5	20	140	20	20	20	20	20	20	20	1000	500	20
6	20	20	1000	20	20	20	1000	20	1000	1000	20	1000
7	20	20	20	1000	20	20	20	20	1000	20	20	20
8	20	20	20	20	1000	20	20	20	1000	20	480	20
9	20	20	20	20	20	20	20	1000	20	1000	20	1000
10	20	1000	20	20	280	20	20	20	20	20	1000	20
11	1000	20	20	20	20	20	20	1000	20	20	20	20
12	20	20	20	1000	20	20	20	20	20	1000	1000	1000
13	20	20	1000	1000	20	1000	1000	20	20	20	320	20
14	20	20	20	20	20	1000	20	1000	20	20	20	1000
15	20	20	20	20	20	20	20	1000	1000	20	20	1000
16	20	1000	20	20	450	20	1000	20	1000	1000	20	1000
17	340	20	20	20	1000	20	1000	20	20	20	20	20
18	20	20	1000	20	20	20	20	20	1000	20	660	20
19	20	20	20	20	20	20	1000	20	1000	1000	20	20
20	20	20	20	20	20	1000	20	1000	20	20	20	20
21	20	340	20	20	20	1000	20	1000	340	1000	20	1000
22	20	20	20	20	20	20	1000	20	1000	20	20	440
23	20	20	20	20	20	20	1000	20	20	20	20	20

Table 4: The status of pulse transformers for 24 hours to optimizing the electrical losses

Time (h)	1	2	3_4	5	6	7_8	9	10	11	12	13	14	15	16	17_19	20	21	22	23
Tap1	-10	10	-10	10	-10	-10	10	10	-10	-10	10	-10	10	10	-10	10	10	10	-10
Tap2	-10	10	10	-10	10	-10	10	-10	10	-10	-10	-10	-10	10	-10	10	-10	10	-10

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RESEARCH ARTICLE

The Effect of Selected Primary School Games on Fundamental Skills of Locomotor among the Girls and Boys Aged 7-9 Years.

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ABSTRACT

The present study evaluated the effect of selected games in primary school on locomotorskills of the girl and boy students aged 7-9 years. Random clustering sampling was used to select the control and experiment groups. Socio-economic factors, intelligence and body mass index (based on height and weight) were controlled. The sample was 152 (76 girls and 76 boys) (Morgan Table). Pre-test was conducted of all the samples and the scores were registered by two examiners in two angles and then by camera in a different angle with them (the examiners were justified regarding the test). 76 people (38 girls and 38 boys) were selected in experiment group to perform the researcher games in their sport time. 76 students (38 girls and 38 boys) were selected in control group to do the normal sport activities. After 24-28 sessions, posttest was performed. The measures in pre-test and post-test was test of gross motor development, version 2. To evaluate normality, kolmogorovsmirnov test was used. Then, the hypotheses were analyzed using one-way and two-way variance analyses. The results showed that without considering gender, primary school games were effective on fundamental skills of locomotor.

Keywords: Games, Fundamental skill, Locomotor, Test of gross motor development

INTRODUCTION

Any person needs thinking for his intellectual and social development and playing is the foundation of thinking (Mahjur, 2008). Most of the advanced countries in the world believe the main bases of learning are in childhood and physical activities and sport are the basic needs for the best people and scientific communities (Qasemnejad, 2011). One of the important issues in researches of recent years is "fundamental skills development" as the child specialists, parents and physical education teachers consider it more (GalahooOzmun, 2006; Translated by Hemayattalab *et al*.,

2011). Based on the importance of motor skills to fitness activities, we should innovate some strategies to be sure of receiving adequate training of these motor skills in primary schools and this period is called the golden age of skill learning. Entering the unknown world of children should be done carefully by the physical education teachers without considering their physical, mental and behavioral features. One of the ways to evaluate the children as naturally is during playing (Ghasemnejad, 2011). Motor development is necessary for complete growth and it is also the ultimate goal of physical education (Barton ,Fvrans and Carbi, translated by Yusefi, 2002). Based on the studies regarding the sport activities and playing in Iran, Some researchers conducted some researches regarding the impact of playing on cognitive processes (Salman, 1993, Dehghani *et al*., 2011; AslanKhani, 1999). Also, some studies have been done in abroad. Some researchers evaluated the effect of fundamental motor skills development on self-conception, language, self-confidence and social-psychological factors and cognitive factors (Hitzeromoblize, 1997; Rudsepp and Paasuke, 1995; Rintala.plinjagay, 2003). Selecting the type of child game depends upon his age and development stages. Pre-school and primary school ages are the most important time for learning fundamental skills. These skills are the basis of all sport, professional skills of life. Fundamental movements are divided into three types including body manipulation (nonlocomotor actions), body projection (locomotor skills), and object control (Shojai and Daneshfar, 2011).

SusaneIzek, the famous English coach believed that children activities as playing are the real key to full development. In early years of primary school, the playing is including running and leaping (Qasemnejad, 20110.Locomotor skill is the skill in which the body moves from vertical to horizontal direction (GalahooOzmun, 2006; Translated by Hemayattalab *et al*., 2010). Locomotor is one of the basic learning aspects for movement as effective in the environment. Locomotor skills include walking, running, jumping, hopping, sliding ,skipping, galloping and etc (Shojayi and Daneshfar, 2011). Operational definition of locomotor skill: The present study measured locomotor skills by Ulrich locomotor subtest 2000 (Aflatuni, 2011). Physical education is an important factor of education programs and the result is the ability to tolerate body efforts, health recovery and resistance to fatigue (Shafie, 2001).

Schiller believed that: playing is an attempt to spend extra energy of children". Jerome,Bruner believed that children need the physical activities and first experiences to develop their views and think. Playing provides most of these opportunities (Aflatuni, 2011). Doroty Sheridan divided the games into five groups: Active playing, skill and explorative play, imitating play, role play and systematic play.MahparyGhasemnejad divided plays into two types: Individual games: The child plays alone and they are self-centered. Collective games: All the plays with other children (Qasemnejad, 2011).Primary school plays are divided into three general groups:Group plays, combined sport plays, local-ethnic plays (Ershad, Azmon, Judy, 2012).Bending, stretching, twisting, swinging, sway, access, lifting, pushing and pulling are axial movements. In axial movement dynamic and static balance are the main elements of body manipulation. Other states in which keeping static or dynamic balances is important include standing, siting, balancing, rolling, stopping, coming down, walking on balance beam and balance on one foot (Shojai and Daneshfar, 2011).

Eleni *et al*., (2006) investigated the effect of implementing intervention program on motor skills of kindergarten children aged 4-5 years. The results showed that implementation of intervention in experiment groups had significant effect on children locomotor skills compared to control group.Dylan P *et al*. (2007) in a study "Relationships between fundamental movement skills and objectively measured physical activity in pre-school children" evaluated the gender differences in temporary relations between fundamental motor skills (motor skills) and physical education among the pre-school children. It is possible, gender and development of fundamental skills affect the relationship between fundamental motor skills and physical activity among the pre-school children.Fatma A. (2011) evaluated effects of a structured physical activity program on fundamental motor skill development of disadvantaged institutionalized children. She found that movements change and their skills and activities are increased.

Study hypotheses

The general hypothesis of the study is as: The selected primary school plays affect the fundamental locomotor skills of girls and boys aged 7-9 years. The selected primary school plays affect the fundamental locomotor skills of girls aged 7-9 years. The selected primary school plays affect the fundamental locomotor skills of boys aged 7-9 years. There is a difference between girls and boys aged 7-9 years regarding the effect of selected primary school plays on fundamental locomotor skills.A review of the previous studies showed that a few researches are conducted regarding the role or effect of playing in fundamental skills and mostly evaluated the effect of cognitive skills and perceptual-motor skills and effective factors on fundamental motor development as age, gender and etc. The present study evaluated the effect of play as a happy motor experience on fundamental skills of children. The researcher attempted to answer this question whether primary school plays affect fundamental locomotor skills of children or not?

METHODOLOGY

Data collection methods
Independent variable

Independent variable in this study is implementation of selected primary school games by which the students of first to third of primary school play for 4.5 months, two sessions per week for 45min.

Dependent variables

Dependent variables in the study are locomotor skills development and Ulrich gross motor development test was used. Gross motor score was obtained of the sum of the standardized scores of manipulation skill subtest. Locomotor skills include subtests of, running, jumping, hopping, skipping, galloping, leaping, and sliding.

Results analysis method

After data extraction, descriptive statistics were used for classification, data, determining central measures (mean and median) and dispersion indices (standard deviation and variance) and various charts and tables. The normality was evaluated by Kolmogorov-Smirnov. Inference statistics (F test and one and two-way analysis variance) was applied for data analysis. It can be said this is mentioned in details in chapter 4. The statistical analyses were done by SPSS software, version 20 and the charts were plotted by Excel software.

RESULTS

The frequency of subjects in experiment and control groups based on gender is shown in Table 1. Most of the subjects were girls (51.3%) and a few were boys (48.7%) in the experiment group and in control group, many subjects were girls (50.7%) and a few were boys (49.3%).As shown in the table 2, many subjects of experiment group were 9 (36.8%) and a few of them were 8 years old (30.3%). Many subjects were 8(37.3%) and a few were aged 9 years old (29.3%).Table 3 shows the frequency of subjects in two groups based on socio-economic condition. Table 3, many subjects of experiment group had good socio-economic condition (69.7%) and a few were average (30.3%). In control group, many subjects had good socio-economic condition (74.3%) and a few had average condition (25.3%).As shown in Table 4, the mean and standard deviation of IQ of subjects of experiment group were 111.96, 6.45, respectively and in control group as 111.16 and 6.43. As shown in Table 5, the mean and standard deviation of the weight of subjects are 26.11 and 4.77, respectively and in control group 25.28 and 4.79.

As shown in Table 6, the mean and standard deviation of height of subjects in experiment group were 1.27, 0.05, respectively and in group control 1.26, 0.05.As shown in Table 7, the mean and standard deviation of body mass index of the subjects of experiment group are 16.03, 1.79, respectively and in control group 15.58, 1.69%.

Descriptive statistics of study variables

In this section, the information of descriptive statistics of study variables is shown in Figure 1 and Table 8.As shown in the above table, the mean and standard deviation of the total scores of locomotor in experiment group in pre-test are 24.64, 6.20, respectively and 38.94, 4.74 in post-test. Also, the mean and standard deviation of the locomotor scores in control group in pre-test stage are 26.46, 6.24, respectively and in post-test stage as 38.34, 4.67. To test the hypotheses and responding the study questions, one-way and two-way covariance analyses were used. One of the assumptions of these statistical methods is normality of the data. To evaluate the normality, kolmogorovsmirnov test was applied. The results are shown in the table9.

First hypothesis: The selected primary games were effective on fundamental skills of locomotor of the girls aged 7-9 years old.

Covariance analysis was used to test the above hypothesis. The investigations regarding homogeneity covariance of variances via Levene test showed that these assumptions are observed (F=0.001, P>0.05).Also, the results of homogeneity covariance analysis of regression gradient showed that the internal between the groups (experiment and control groups) and variable (locomotor pretest score) was not significant (F=1.36, P>0.05), it means that regression gradient for experiment and control groups were similar and this assumption is observed.As shown in the findings of Table 10, by pre-test score, there was no significant difference between locomotor scores of the girls of experiment and control groups (Eta coefficient= 0.038, P>0.05, F=2.89). It means that girls performance in locomotor was similar in both experiment and control groups.

Second hypothesis: The selected primary school games were effective on fundamental skills of locomotor of boys aged 7-9 years

To test the above hypothesis, covariance analysis is used. To be sure of similarity of variances in covariance analysis for studied groups, the investigations of homogeneity covariance analysis of variances via Leven test showed that these assumptions are included (F=2.09, P>0.05).The results of homogeneity covariance analysis of regression gradient showed that the interaction between the groups (experiment and group control) and variable (pre-test of locomotor) was not significant (F=0.006, P>0.05). It means that regression gradient for experiment and control groups is similar and this assumption is observed.As shown in Table 11, by controlling pre-test score, there is no significant difference between locomotor of boys in experiment and control groups (Eta coefficient =0. 051 P>0.05, F=3.82). Thus, boys performance in locomotor in both groups of experiment and control was the same.

3-4 Third hypotheses: There is a difference between the girls and boys aged 7-9 years old regarding the effect of selected primary school games on fundamental skills of locomotor.

Two-way covariance analysis was used to test this hypothesis. This test was used as the researcher attempted to compare the scores of gender and group at the same time in two dependent variables. This study included two independent factors of gender and group and each of the factors have two levels and as each group had two pre-test and post-test scores, the pre-test scores are controlled to know whether the effectiveness of two groups is different based on gender or not?To perform two-way covariance analysis, the results of homogeneity covariance analysis by Levene's test showed that this assumption is observed (F=0.75, P>0.05). The results of two-way variance analysis are shown in Table 12.

The above Table showed that the effect of gender and interaction of group and gender was not significant in dependent variables. As shown in the table, the gender effect showed that there is no significant difference in locomotor (F=2.83, P>0.05) but group difference showed that there is a significant difference among the experiment and control group children in locomotor variable (F=7.03, p<0.01). As shown in Table 8, the changes of total score of locomotor of experiment group in posttest compared to pre-test was more than the changes of posttest compared to pretest in control group. It can be said that the games approved in primary school were effective on locomotor skill of students. As shown in Table 12, there is no interaction between group and gender in the mean of the locomotor scores (F=0.15, P>0.05). This finding showed that children scores in experiment and control groups in locomotor variable are not affected by gender and the group (performing the games of primary schools) increased the locomotor skill of students and it is not dependent upon gender.

DISCUSSION AND CONCLUSION

As shown in the findings of Table 10, by pre-test score, there was no significant difference between locomotor scores of the girls of experiment and control groups (Eta coefficient= 0.038, P>0.05, F=2.89). in other words, the plays can not affect the running, jumping, hopping, sliding , skipping, galloping among the girls. The result of this study is in not in line with the studies of Nazarian (2003), Akbari (2007) and Eleni (2006). Indeed, all the researches emphasized on the effect of exercise on locomotor skill. One of the reasons of inconsistency is involving gender. Total score without gender, the games affect locomotor skill. In other words, when only girls are considered, it has no significant effect but the sum of girls and boys (total score based on experiment and control groups), the effect is significant. As shown in Table 11, by controlling pre-test score, there is no significant difference between locomotor of boys in experiment and control groups (Eta coefficient =0. 051 P>0.05, F=3.82). Thus, boys performance in locomotor in both groups of experiment and control was the same. In other words, the effect was significant. The games affect the skills of running, jumping, hopping, sliding, skipping, galloping. This finding is in line with the study of Williams (1998). He believed that participating in activities had no effect on fundamental motor skills and these skills only develop based on age and development. This result is not in line with the studies of Nazarian (2003), Akbari (2006), Cooly and Eleni (2006). Indeed, all the researches emphasized on the effect of exercise on locomotor skill. One of the reasons of this inconsistency is involving gender but total score without considering gender, the games will be effective on locomotor skill. In other words, when we consider only the boys, it has no significant effect, but as the sum of girls and boys (total score based on experiment groups).

Table 12 showed that the effect of gender and mutual action of group and gender in dependent variables was not significant. It showed that there was no significant difference among the girl and boy children regarding locomotor (the lack of gender effect). The group effect showed that there was a significant difference among the children between experiment and control group in locomotor variable. As shown in Table 8, the posttest changes compared to pre-test in experiment group in total score of locomotor were more than posttest changes compared to pretest in control group. It can be said that primary school games were effective on increasing students'locomotor skill.Also, based on Table 12, there was no interaction between group and gender in the mean of locomotor scores. This finding showed that children scores in experiment and control groups in locomotor variable was not affect by gender variable and the group (implementation of approved primary school games) increased the locomotor skill among the students and it is not dependent upon gender.

Recommendation

Fundamental motor skills are defined as systematic motor models. These skills are pre-requirements of the participation of children in plays and various physical activities and development of these skills has close association with child growth in cognitive, affective, mental-social fields. By providing the suitable factors and adequate time, child motor growth is facilitated. School is one of the most important places in which children spend much time. If the education organization considers the importance of motor development of children and provide the required

factors, the child can eliminate most of his fundamental motor needs at the best time and place. Based on the investigations on normal primary school students in most of the regions, it is shown that most of them have poor motor disorder. In recent years, education physical education had considerable planning to eliminate the problem of children. Some plans are issued in primary level and each of them has considerable long-term and short-term goals and achieving those meet most of the motor demands of children. Some projects as national plan of gymnasts for second grade, Sabah (swimming training) of third grade, Tanavarz plan (rope training) for fourth grade, tennis training for fifth grade and track and field for sixth grade of primary school. Based on the shortage of sport halls and swimming pools in the town and the shortage of specialized human resources, it seems that these plans have no considerable efficiency in the towns and villages. The useful sport plans are those not requiring specific tools and also they can be implemented everywhere and they create happiness among the students and their motor needs are eliminated. The main question is which plan is implemented. To answer this question we can refer to the primary plays and local-ethnic games. The results of the study regarding the effect of primary school games on fundamental motor skills showed the effect of game on the major children motor need without considering gender. Thus, effectiveness of selected primary school games is similar on increasing the locomotor skills of girls and boys. The study findings include:

The selected primary plays had no significant effect on locomotor skills of girls aged 7-9 years.

The selected primary plays had no significant effect on locomotor skills of boys aged 7-9 years.

There was no significant difference between the girls and boys aged 7-9 years regarding the effect of selected primary plays on fundamental locomotor skills.

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Table 1- Frequency distribution and subjects' percent in experiment and control groups based on gender

%	F	Gender	Group
51.3	39	Girl	Experiment
48.7	37	Boy	
100	76	Total	
50.7	38	Girl	Control
49.3	37	Boy	
100	75	Total	

Table 2- The frequency distribution and subjects' percent in experiment and control groups based on age

%	F	Age	Group
32.9	25	7 years	Experiment
30.3	23	8 years	
36.8	28	9 years	
100	76	Total	
33.3	25	7 years	Control
37.4	28	8 years	
29.3	22	9 years	
100	75	Total	

Table 3- Frequency of subjects in two groups based on socio-economic condition

%	F	Condition	Group
69.7	53	Good	Experiment
30.3	23	Average	
100	76	Total	
74.7	56	Good	Control
25.3	19	Average	
100	75	Total	

Table 4- The mean and standard deviation of IQ of experiment and control groups

Max	Min	SD	Mean	N	Group
128	100	6.45	111.96	76	Experiment
131	100	6.43	111.16	75	Control

Table 5- The mean and standard deviation of the weight of subjects in experiment and control groups

Max	Min	SD	Mean	N	Group
41	20	4.77	26.11	76	Experiment
40	19	4.79	25.28	75	Control

Table 6- The mean and standard deviation of height of subjects in control and experiment groups

Max	Min	SD	Mean	N	Group
1.45	1.17	0.05	1.27	76	Experiment
1.40	1.15	.05	1.26	76	Control

Table 7- The mean and standard deviation of body mass index of subjects in experiment and control groups.

Max	Min	SD	Mean	N	Group
20.09	12.80	1.79	16.03	76	Experiment
20.70	13.19	1.69	15.58	75	Control

Table 8- Descriptive statistics of study variables in pre-test and post-test based on gender

Variable	Statistical index	Test	Gender	Group
Locomotor				
25.97	Mean	Pretest		
5.46	SD		Girl	
39.97	Mean	Post-test		
4.19	SD			
23.24	Mean	Pretest		
6.68	SD		Boy	Experiment group
37.86	Mean	Post-test		
5.08	SD			
24.64	Mean	Pretest		
6.20	SD		Total	
38.94	Mean	Post-test		

4.74	SD			
26.55	Mean	Pretest		
4.92	SD		Girl	
38.97	Mean	Post-test		
4.64	SD			
26.37	Mean	Pretest		
7.43	SD		Boy	Control group
37.80	Mean	Post-test		
34.68	SD			
26.46	Mean	Pretest		
6.24	SD		Total	
38.34	Mean	Post-test		
4.67	SD			

Table 9- The results of normality test of data

Significance	z	SD	Mean	Variables	Group
0.332	0.947	4.74	38.94	Locomotor	Experiment
0.405	0.89	4.67	38.34	Locomotor	Control

Table 10- The results of one-way covariance analysis to compare the mean of the locomotor scores of girls aged 7-9 years old in two groups

Eta square	Significance level	F	Mean of squares	Degree of freedom	Sum of squares	Variance
0.418	0.000	53.16	612.89	1	612.89	Pre-test score
0.038	0.093	2.89	33.34	1	33.34	Group
			11.52	74	853.05	Error
				77	121506	Total

Table 11- The results of one-way covariance analysis to compare the mean of locomotor scores of the boys aged 7-9 years old in both groups

Eta square	Significance level	F	Mean of squares	Degree of freedom	Sum of squares	Variance
0.477	0.000	64.66	821.75	1	821.75	Post -test score
0.051	0.055	42.16	48.55	1	48.55	Group
			12.70	71	902.30	Error
				74	107368	Total

Table 12- The results of two-way covariance analysis to compare the mean of locomotor skill in experiment and control groups based on gender.

Eta square	Significance level	F	Mean of squares	Degree of freedom	Sum of squares	Variance
0.448	0.000	118.32	1428.01	1	1428.01	Pre-test score
0.019	0.095	2.83	34.18	1	34.18	Gender
0.046	0.009	7.03	84.83	1	84.83	Group
0.001	0.693	0.15	1.88	1	1.88	Group*gender
			12.06	146	1761.98	Error
				151	278874	Total

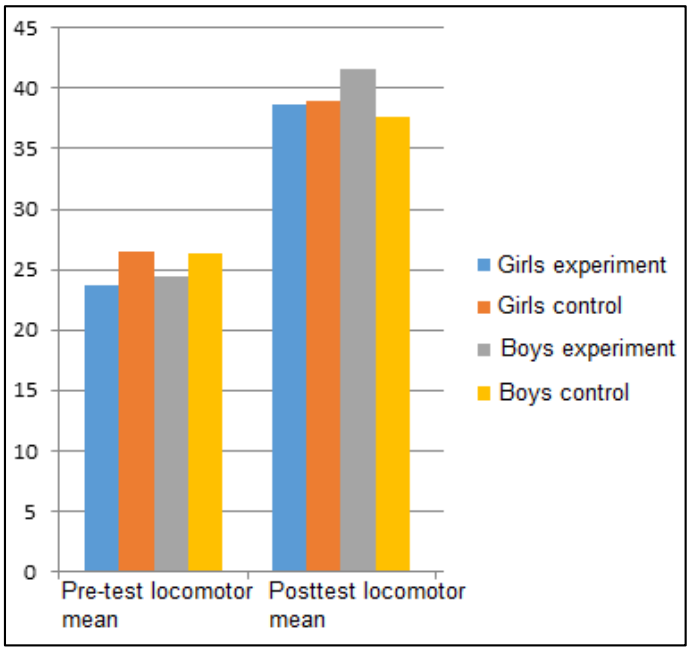

Figure 1 .The mean of locomotor skills in pre-test and post-test in control and experiment groups based on gender

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RESEARCH ARTICLE

G-Regular and Strongly G-Regular Rings.

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ABSTRACT

In this paper we introduce G-regular and strongly G-regular rings, where are a generalization of π-regular and strongly π-regular rings. Ultimately, we prove some results about abelin G-regular rings.

Keywords: Group, ring, von neumann regular, G-regular, strongly G-regular.

INTRODUCTION

In 1936 Von Neumann defined that an element x in R is regular if x=xyx, for some y∈R, the ring R is regular if each of its elements is regular and an element x∈R is said to be strongly (vonneumann) regular if there exists y∈R such that $x = x^2y$, the ring *R* is strongly regular if each of its elements is strongly regular. Some properties of regular rings and strongly regular has been studied in [7, 12, 17]. A ring R is said to be π-regular if for every element a∈R, there is an element b∈R such that $a^n = a^nba^n$ for some positive integer n. And a ring R is said to be strongly π-regular if for every x∈R, there is a positive integer m with $x^m = x^{(m+1)}R$. In many papers concerned π-regular and strongly π-regular rings, see[2, 3, 4, 5, 6, 9, 13, 14, 15, 16, 18, 20, 21, 23]. Recently in several papers for example [10, 11, 19, 22], commuting regular and strongly commuting regular rings is defined and structured. We shall call a ring is abelian if idempotents in it, to be centeral. Throughout the present article R is an associative ring with identity 1, and G denote a group, Id(R) the set of idempotents and $M_n(R)$ the ring of all n×n matrices over R. Let X be a set. Group action is a mapping μ:X×G⟶X (If there is no fear of confusion, we write $\mu(x,g)$ simply as x^g) such that(i) $(x^g)^h = x^{gh}$ for all x∈X and g, h∈G,(ii)$x^1=x$ for all x∈X .For every element g∈G we set $X^g= \{x^g | x\in X\}$.

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Group-regular rings

At first we define G-regular and strongly G-regular rings.We define an element $x\in R$ to be G-regular if there exists an element $g\in G$, depending on x, and $r\in R$ such that $x^g = x^g r x^g$. R is said to be G-regular if all of its elements are G-regular.For each $n\in\mathbb{N}$ by a^{ng} we mean $(a^g)^n$.We define an element $x\in R$ to be strongly G-regular if there exists an element $g\in G$, depending on x, and $r\in R$ such that $x^g=x^{2g}r$ with this property that $(x^2)^g = (x^g)^2$. R is said to be strongly G-regular if all of its elements are strongly G-regular.

Here we give some examples of group-regular rings. It is trivial that if G is trivial group (group with only one element) then in R is G-regularity is equivalent to von neumann regularity.Let G=U(R) (where U(R) is the group of units of R). We call the action $(x,g)\longrightarrow gx$ from R×G to R, regular action and the action $((x, g) \rightarrow gxg^{-1})$ from R×G to R is called conjugate action.For example Let G=U(R). We define an element $x\in R$ tobe unitary regular (resp. strongly unitary regular) element if there exists an element $g\in G$, depending on x, and $r\in R$ such that xg=xgrxg (resp. xg = $(xg)^2r$). R is said to be unitary regular (resp. strongly unitary regular) if all of its elements are unitary regular (resp. strongly unitary regular).Let G=U(R) . We define an element $x\in R$ tobe conjugate regular (resp. strongly conjugate regular) element if there exists an element $g\in G$, depending on x, and $r\in R$ such that $x=xg^{-1}rgx$ (resp.$xg=x^2gr$). R is said to be conjugate regular (resp. strongly conjugate regular) if all of its elements are conjugate regular (resp. strongly conjugate regular).Let Aut(R) be automorphism group of R. We define an element $x\in R$ to be Automorphic-regular ((Aut)-regular) if there exists an element $\alpha\in$Aut(R), depending on x, and $r\in R$ such that $x^\alpha=x^\alpha rx$, where $x^\alpha=\alpha(x)$. R is said to be automorphic regular if all of its elements are automorphic regular. If choice of α is independent of x we say that R is α-regular.Also we define a G-regular ideals as follows:A two sided ideal J in a ring R is G-regular provided that for each $x\in J$, There exists $y\in J$ and $g\in G$ such that $x^gyx^g=x^g$.Let $\mu:R\times G\longrightarrow R$ be a group action and I be a two sided ideal of R. Then G can acts naturally on R/I by the rule $\mu(r + I, g)=\mu(r,g)+I$ (i.e. $(r+I)^g=r^g+I$) .

Theorem : Every factor ring of a G-regular (resp. strongly G-regular) ring is G-regular (resp. strongly G-regular). In particular a homomorphic image of a G-regular ring is G-regular. Let R be G-regular (resp. strongly G-regular) and I be a two sided ideal of R. Let $x=x+1\in R/I$ since R is G-regular, there exists $g\in G$ and $r\in R$ such that $x^g=x^grx^g$ (resp. $x^g = x^{2g}r$). So $\overline{x^g}=\overline{x^g}\overline{r}\,\overline{x^g}$ (resp.$\overline{x^g}=\overline{x^{2g}}\overline{r}$). Thus by definition we have $\bar{x}^g=\bar{x}^g\bar{r}\bar{x}^g$ (resp. $\bar{x}^g=\bar{x}^{2g}\bar{r}$) as we want.

Lemma : Let G be a group acts on the ring R by this property that $(xy)^g=x^gy^g$ for each $x,y\in R$. If $x,y\in R$, $g\in G$ and $x'=x^g-x^gyx^g$, and if $x'^h=x'^hax'^h$ for some $a\in R$ and some $h\in G$. Then $x^g = x^gbx^g$ for some $b\in R$.

Proof. We have

$x^g=x'+x^gyx^g$

$=(x'^hax'^h)^{h^{-2}}+x^gyx^g$

$=(x'^h)^{h^{-2}}a^{h^{-2}}(x'^h)^{h^{-2}}+x^gyx^g$

$= x'a^{h^{-2}}x'+ x^gyx^g=(x^g-x^gyx^g)a^{h^{-2}}(x^g-x^gyx^g) + x^gyx^g$

$= (x^ga^{h^{-2}}-x^gyx^ga^{h^{-2}})(x^g-x^gyx^g)+x^gyx^g$

$= x^ga^{h^{-2}}x^g- x^gyx^ga^{h^{-2}}x^g- x^ga^{h^{-2}}x^gyx^g + x^gyx^ga^{h^{-2}}x^gyx^g + x^gyx^g$

$= x^g(a^{h^{-2}}-yx^ga^{h^{-2}}-a^{h^{-2}}x^gy + yx^ga^{h^{-2}}x^gy + y)x^g.$

Now by taking $b=a^{h-2}-yx^{g}a^{h-2}-a^{h-2}x^{g}y+yx^{g}a^{h-2}x^{g}y+y$ we have $x^{g}=x^{g}bx^{g}$.□

Theorem : Let $J\leq K$ be two sided ideals in a ring R. If J and K/J are both G-regular then K is G-regular.
Proof. Assume that J and K/J are both G-regular. Given $x\in K$, it follows from the G-regularity of K/J that $x^{g}-x^{g}yx^{g}\in J$ for some $y\in K$. Consequently, $(x^{g}-x^{g}yx^{g})^{h}=(x^{g}-x^{g}yx^{g})^{h}z(x^{g}-x^{g}yx^{g})^{h}$ for some $z\in J$ and $h\in G$, from which by lemma 2.10 we conclude that $x^{g}=x^{g}wx^{g}$ for some $w\in K$. Thus, K is G-regular.

Theorem : Let $J\leq K$ be two sided ideals in a ring R. If K is G-regular then K/J is regular.
Proof. It is trivial.
We define action of G on $\prod_{i\in I}R_i$ by the following manner:
For each $g\in G$ and $(x_i)\in\prod_{i\in I}R_i$ we define $(x_i)^{g}=(x_i^{g})_{i\in I}$ Thus
we have;

Lemma : A finite direct product $\prod_{i\in I}R_i$ (I is a finite set) of G-regular rings $\{R_i\}_{i\in I}$ is G-regular, where G is an abelian group and for any $a,b\in R_i$, $g\in G$ and $i\in I$ we have $(ab)^{g}=a^{g}b^{g}$.Proof. At first we prove that direct product of two G-regular rings is G-regular. Let R_1 and R_2 be two G-regular rings. Then for every $(a_1, a_2)\in R_1\times R_2$ there exists $g_1, g_2\in G$, $(r_1, r_2)\in R_1\times R_2$ such that $a_1^{g_1}=a_1^{g_1}r_1a_1^{g_1}$ and $a_2^{g_2}=a_2^{g_2}r_2a_2^{g_2}$. Now by setting $g = g_1g_2$ we have
$(a_1,a_2)^{g}=(a_1^{g},a_2^{g})=((a_1^{g_1})^{g_2},(a_2^{g_2})^{g_1})=((a_1^{g_1}r_1a_1^{g_1})^{g_2},(a_2^{g_2}r_2a_2^{g_2})^{g_1})=(a_1,a_2)^{g}(r_1^{g_2},r_2^{g_1})(a_1,a_2)^{g}$
Thus by induction any finite direct product of G-regular rings is G-regular.

Theorem :(1) Let $x\in R$ be G-regular then there exists $g\in G$ and $r\in R$ such that $x^{g}r$ is idempotent.
(2) If an element $x\in R$ is von neumann regular, then it is G-regular by taking G to be trivial group.
(3) If an element $x\in R$ is π-regular, then it is $\mathbb{Z}$-regular in which $\mathbb{Z}$ acts on R by the rule $\mu(x,n)=x^{n}$ for any $n\in\mathbb{Z}$.
(4) An element $x\in R$ is G-regular if there exists $g\in G$ such that x^{g} is von Neumann regular.
Proof. (1) Since $x\in R$ is G-regular thus there exists $g\in G$ and $r\in R$ such that $x^{g}=x^{g}rx^{g}$ therefore $x^{g}r=x^{g}rx^{g}r=(x^{g}r)^{2}$.
(2),(3),(4) are trivial.

Theorem : Let R be a commutative ring. Then the following statements are equivalent for $x\in R$:
(1) x is von neumann regular.
(2) $x^{2}u=x$ for some $u\in U(R)$.
(3) $x=ue$ for some $u\in U(R)$ and $e\in Id(R)$.
(4) $xy=0$ for some von neumann regular element $x\neq y\in R$ with $x+y\in U(R)$.
(5) $xy=0$ for some $y\in R$ with $x+y\in U(R)$.
Proof. see [1].□
Theorem : Let R be a commutative ring. Then the following statements are equivalent for $x\in R$:
(1) x is G-regular.
(2) x^{g} is von neumann regular for some $g\in G$.
(3) $x^{g}=ue$ for some $u\in U(R)$, $e\in Id(R)$, and $g\in G$.
Proof. we deduce from theorem 2.15.
Theorem : Let S be the center of G-regular ring R with the property that $S^{g}\subset S$, $\forall g\in G$. Then S is G-regular.
Proof. Let R be a ring with center S, and let $x\in S$. There exists $y\in R$ and $g\in G$ such that $x^{g}yx^{g}=x^{g}$, and we set $z=yx^{g}y$. Note that

$$x^{g}zx^{g}=x^{g}yx^{g}yx^{g}=x^{g}$$

given any $r\in R$, we have $zr=yx^{g}yr=y^{2}rx^{g}=y^{2}rx^{g}yx^{g}=yx^{g}yx^{g}ry=yx^{g}ry$ Similarly we have $rz=yrx^{g}y$, so $rz=yrx^{g}y=yx^{g}ry=zr$, therefore $z\in S$. Thus S is also G-regular.□
Theorem : Let R be a strongly G-reguler ring such that for any $g\in G$, $a^{g}=0$ implies that $a=0$. Then R is G-regular.
Proof. Assume R is a strongly G-regular ring. Then for any $a\in R$ there exists $r\in R$ and $g\in G$ such that $a^{g}=a^{2g}r$. so if $a^{2}=0$, then we have $a^{g}=0$ and consequently $a=0$. Thus R is reduced. Therefore, we obtain
$(a^{g}-a^{g}ra^{g})^{2}=a^{2g}-a^{g}a^{g}ra^{g}-a^{g}ra^{g}a^{g}+a^{g}ra^{g}a^{g}ra^{g}=a^{2g}-a^{2g}-a^{g}ra^{2g}+a^{g}ra^{2g}=0$,

So we have $a^g = a^g r a^g$.
For example every strongly (Aut)-regular (Example 2.7) ring is (Aut)-regular.
Theorem: If R is a G-regular domain, then R is a strongly G-regular.
Proof. Since R is G-regular, for each $x\in R$, there exists $r\in R$, $g\in G$ such that $x^g=x^g r x^g$. If $x^g=0$ for some $g\in G$ Then trivialy $x^g=x^{2g}r$ for any $r\in R$ so R is strongly G-regular as we wants.
Otherwise if $x^g\neq 0$ for any $g\in G$ then $x^{2g}=x^{2g}rx^g$, i.e.,$(x^{2g}-x^{2g}rx^g)=0$. So $(x^g-x^{2g}r)x^g=0$. Since R is domain, this implies that $x^g = x^{2g}r$, therefore R is strongly G-regular.

abelian G-regular rings

Lemma : Let R be an abelian G-regular ring. Then for each $x \in R$, there exists $r\in R$, $g\in G$ such that $x^g r = rx^g$.
Proof. Since R is G-regular, then $x^g r, rx^g \in Id(R)$ and since R isabelian then $x^g r, rx^g \in Z(R)$, therefore we have;

$$x^g r=(x^g rx^g)r=x^g(rx^g)r=x^g r(rx^g)=r(x^g r x^g)=rx^g \square$$

Theorem : Let R be an abelian G-regular ring. Then for each $x\in R$, there exists $g\in G$, $r\in R$ such that $x^{2^n g}=x^{2^n g}rx^{2^n g}$, for each $n\in\mathbb{N}\cup\{0\}$.Proof. We proceed by induction on n. let n=0. Then by definition, is clear. suppose n=1, then since x is G-regular, we have $x^{2g}=x^g rx^g x^g rx^g$ and since R is abelian then by lemma 3.1, we deduce that:

$x^{2g}=x^g rx^g x^g rx^g$
$=x^g x^g rx^g rx^g$
$=x^{2g}rrx^g x^g$
$=x^{2g}\, r' x^{2g}$.

Where $r'=r^2$. We assume that the theorem is true for n = k. Now we have:

$$x^{2^k g}=x^{2^k g}rx^{2^k g}\Longrightarrow x^{2^k g}x^{2^k g}=x^{2^k g}rx^{2^k g}x^{2^k g}rx^{2^k g}$$
$$=x^{2^k g}x^{2^k g}rx^{2^k g}rx^{2^k g}=x^{2^k g}x^{2^k g}rrx^{2^k g}x^{2^k g}\text{ (by lemma 3.1)}$$
$$\Longrightarrow x^{2^{k+1}g}=x^{2^{k+1}g}r'x^{2^{k+1}g}$$

Thus the theorem is true for n=k + 1, i.e the lemma is true for each n and this completes the proof.
Lemma : Let R be an abelian G-regular ring. The following are equivalent.
1) For each $x \in R$, there exists $g\in G$, $r\in R$ such that $x^{2^n g}=x^{2^n g}rx^{2^n g}$, for each $n\in\mathbb{N}\cup\{0\}$.
2) For each $x\in R$, there exists $g\in G$, $r\in R$ such that $rx^{2^n g}, x^{2^n g}r\in Id(R)$, for $n\in\mathbb{N}$.
3) For each $x\in R$, there exists $g\in G$, $r\in R$ such that $x^{2^n g}r=rx^{2^n g}$,for each $n\in\mathbb{N}\cup\{0\}$.
Proof. (1⟹2) Since R is G-regular then for each $x\in R$ there exists $g\in G$, $r\in R$ such that $x^{2^n g}=x^{2^n g}rx^{2^n g}$, for each $n\in\mathbb{N}\cup\{0\}$. Thus we have:

$$x^{2^n g}r=x^{2^n g}rx^{2^n g}r\Longrightarrow x^{2^n g}r=(x^{2^n g}r)^2 \text{ and}$$
$$rx^{2^n g}=rx^{2^n g}rx^{2^n g}\Longrightarrow rx^{2^n g}=(rx^{2^n g})^2$$

so $rx^{2^n g}, x^{2^n g}r\in Id(R)$.
(2⟹3) Since R is a G-regular ring, then for every $x\in R$, there exists $g\in G$, $r\in R$ such that $x^{2^n g}=x^{2^n g}rx^{2^n g}$ and since R is abelian and $rx^{2^n g}, x^{2^n g}r\in Id(R)$ then $x^{2^n g}r, rx^{2^n g}\in Z(R)$. So we have,

$$rx^{2^n g}=r(x^{2^n g}rx^{2^n g})=r(x^{2^n g}r)x^{2^n g}$$
$$=(x^{2^n g}r)rx^{2^n g}=x^{2^n g}r(x^{2^n g}r)$$
$$=x^{2^n g}(rx^{2^n g})r=(x^{2^n g}rx^{2^n g})=x^{2^n g}r.$$

(3 ⇒ 1)Since R is abelian G-regular then by (3), $rx^{2^n g}, x^{2^n g}r\in Id(R)$, thus we have:

$$x^{2^n g}=x^{2^{n-1}g}x^{2^{n-1}g}$$
$$=(x^{2^{n-1}g}rx^{2^{n-1}g})(x^{2^{n-1}g}rx^{2^{n-1}g})$$
$$=(x^{2^{n-1}g}x^{2^{n-1}g}r)(rx^{2^{n-1}g}x^{2^{n-1}g})$$
$$=(x^{2^n g}r_1x^{2^n g})$$

Where $r_1=r^2$
Theorem : Let R be an abelian G-regular ring, then R is a strongly G-regular ring.
Proof. Let R be a G-regular ring, then for every $x\in R$, there exists $r\in R$, $g\in G$, such that $x^g=x^g rx^g$. Since R is a abelian ring by previous lemma, $x^g r=rx^g$. Then we have $x^g=x^g rx^g=x^g x^g r=x^{2g}r$ So R is strongly G-regular.

Definition : We define an element $x\in R$ to be unit G-regular if there exists an element $g\in G$, depending on x, and $u\in U(R)$ such that $x^g=x^gux^g$. R is said to be unit G-regular if all of its elements are unit G-regular.

Theorem : Let R be an abelian G-regular ring, then R is unit G-regular.

Proof. Since R is abelian G-regular by lemma 3.3, for each $x\in R$, there exists $g\in G$, $y\in R$, such that $x^gy=yx^g$.

Let $u=x^g + x^gy -1$ and $v=x^gy+x^gy^2-1$. Since $x^gy=yx^g$, wehave;

$uv=(x^g+x^gy-1)(x^gy+x^gy^2-1)$

$=x^g(x^gy)+x^gx^gy^2-x^g+(x^gy)(x^gy)+(x^gy)(x^gy^2)-x^gy-x^gy-x^gy^2+1$

$=x^g(yx^g)+(x^gyx^g)y-x^g+(x^gyx^g)y+(x^gyx^g)y^2-x^gy-x^gy-x^gy^2+1$

$=x^g+x^gy-x^g+x^gy+x^gy^2-x^gy-x^gy-x^gy^2+1=1$

And

$vu=(x^gy+x^gy^2-1)(x^g+x^gy-1)$

$=x^gyx^g+x^gyx^gy-x^gy+x^gy^2x^g+x^gy^2x^gy-x^gy^2-x^g-x^gy+1$

$=x^gyx^g+(x^gyx^g)y-x^gy+x^gy(yx^g)+x^gy(yx^g)y-x^gy^2-x^g-x^gy+1$

$=x^g+x^gy-x^gy+(x^gyx^g)y+x^gyx^gy^2-x^gy^2-x^g-x^gy+1$

$=x^g+x^gy-x^gy+x^gy+x^gy^2-x^gy^2-x^g-x^gy+1=1$

Therefore, $uv=vu=1$. Moreover,

$$x^gvx^g=x^g(x^gy+x^gy^2-1)x^g$$
$$=x^gx^gyx^g+x^gx^gy^2x^g-x^gx^g$$
$$=x^gx^g+x^gx^gyyx^g-x^gx^g$$
$$=(x^gyx^g)yx^g=x^gyx^g=x^g.\square$$

Theorem : Let R be an abelian G-regular ring, and $x\in R$. Then there exists $g\in G$, such that $x^g = eu$, for some $e\in Id(R)$ and $u\in U(R)$.

Proof. By theorem 3.6, R is unit G-regular. Thus for some $v\in U(R)$, $x^gvx^g=x^g$. Thus $e=x^gv\in Id(R)$. Let u be the multiplicative inverse of v in R , then $x^g=x^guv = x^gvu = eu$ a product of an idempotent, and a unit of R.

Theorem : For any abelian ring R, show that the following are equivalent:

1) R is a unit G-regular ring.

2) For every $a\in R$, there exists $g\in G$ such that a^g can be written as a product of a unit, and an idempotent of R.

Proof. (1$\Longrightarrow$2) By before theorem, is clear.

(2$\Longrightarrow$1) Suppose there exists $g\in G$ such that $a^g=ve$ where $v\in U(R)$ and $e^2=e$. The latter implies $v^{-1}a^g=v^{-1}a^gv^{-1}a^g$, so $a^g=a^gv^{-1}a^g$, as desired.

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RESEARCH ARTICLE

Relationship of Intellectual Capital and Quality of Working Life among the Employees of Physical Education Organization.

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ABSTRACT

Intellectual capital, especially the human capital, is one of the intangible organizational assets and refers to knowledge, information, experiences, skills, innovations and creativities of employees within an organization which would lead to increase in quality of working life. Thus, the purpose of this research is to study the relationship of intellectual capital and quality of working life among the employees of physical education organization. Participants of research were 305 persons from the employees of physical education organization departments in three Northern provinces of the country that had separately been selected through available sampling. Instrumentation included a questionnaire on personal particulars, Bontis' intellectual capital questionnaire and Walton's quality of working life questionnaire. Kendall's correlation coefficient was used to analyze the data at α<0.05 significance level. The results suggested that there exists a significant relationship between intellectual capital and quality of working life and its components (fair pay, safe workplace, secure growth, individual rights, social solidarity, work and lifestyle, social ties of working life, development of human capabilities) such that increase in intellectual capital leads to higher quality of working life and its components. Quality of working life as a means of people's approach towards their jobs affects their performance and productivity within an organization, therefore it may increase the intellectual capital through correct planning in the workplace and provision of training situations so that the employees may become sufficient in terms of controlling of feelings, emotions and thoughts while intellectual capital is one of the most influential mental constructs for increase in quality of working life.

Keywords: Intellectual capital, fair pay, safe workplace, secure growth, individual rights.

INTRODUCTION

Manpower is the most important factor in achievement of objectives in every organization and success and prosperity of each organization depends on its manpower since humans are the most precious treasure and resource for organizations as they shape organizational decisions, propose solutions and ultimately resolve the problems, enhance the productivity and give meaning to efficiency and influence. So, work carried out through human resources has an important place in survival and enhancement of an organization and the role of humans as a key and strategic figure in the life of organizations is more highlighted and in case the organizations are concerned with concerns human resources development and achievement of stable competitive advantage in the market, then it is necessary for them to satisfy the spiritual and material needs of their employees.

To this end, the concept of quality of working life is one of the organizational theories that have been a matter of attention in recent decades. The theory of quality of working life is on the one hand a factor affecting the organizational growth and development and on the other hand, supplied solutions for increase of productivity of employees and organizations. The concept of quality of working life was introduced in the 1980s which refers to the approach of people toward their jobs i.e. the extent to which mutual trust, care, gratitude, interesting task and appropriate opportunities for investments are provided for the employees in the workplace. The degree of quality of working life within an organization may be estimated through measurement of satisfaction, absence and motivation among employees.

The quality of working life or the quality of work system is one of the most interesting methods of stimulation and an important solution in design and enrichment of jobs which originates from the approach of employees and directors toward motivation. Quality of working life is an expansive work schedule that increases employees' satisfaction, boosts their learning in the workplace and assists them in management of changes and evolutions. Dissatisfaction of employees with quality of working life is a problem which nearly hurts all the employees regardless of their positions. The purpose of many organizations is to increase employees' satisfaction at all levels but this is a complicated situation since it is difficult to determine and discern the relevant features of quality of working life. Study of quality of working life and its relevant variables among the employees of various organizations is of high significance in improvement and enhancement of organizational productivity.

External factors (salary and wages) and internal factors (internal rewards) and the orientation toward the job (priority of internal or external rewards being dependent on personnel) may be regarded as factors having impact on quality of working life with each of these factors discussed as the most important influential factors on quality of working life through a different perspective (scientific management, humanitarian approach, orientation toward job while the three perspectives are unanimous in terms of relevance of personnel performance with quality of working life but it should be noted that a variety of mental constructs apart from external factors may be discussed as the influential internal factors affecting the quality of working life.

Intellectual capital is a valuable resource for countries and organizations as its rate of growth and development is quickly turning into an index of development in countries. On the other hand, this intangible resource has been regarded as one of the value-adding resources of corporate and a key capital in growth of entrepreneurship.Simply put, intellectual capital may be considered as a package of knowledge consisting of a series of intangible and concealed resources of principles, cultures, behavioral patterns, capabilities, merits, structures, communications, processes and procedures which are altogether based on mental inferences. In knowledge-based economy as opposed to industry-based economy, intellectual assets and human capitals are considered the most important assets of organization and the potential success of organizations originates from their intellectual capabilities. Therefore, management of intellectual capital in organizations and their role in acquisition of competitive advantage are of high importance in promotion of organizational objectives. Since intellectual capital comprises innovations, ideas, fundamental knowledge and various design methods of products and it has been discussed as a novel approach to

increase of productivity in organizations. It seems to play an important role in enhancement of quality of working life which is in the first place dependent upon satisfaction of their needs. On the other hand, there are scarce research that study the relationship of intellectual capital and quality of working life. It is anticipated that the results of this research open a new horizon in improvement of quality of working life as the main factor of better performance and productivity of individuals.

Since the Ministry of Sports and Youth is the supreme authority in charge of the issues related to youngsters and sports in Iran, it is obliged with development of a comprehensive national plan for organization of youth affairs with respect to roles and essential missions of public and private sectors institutes while taking into account the cultural, social, political, vocational, academic, recreational and educational needs of youngsters and this calls for capable human resources within the organization. Thus, it is necessary to study the influential factors on quality of working life of employees as it would theoretically strengthen self-sufficiency and improves social and personal relationships while practically speaking, it may increase the productivity of employees such that the financial problems of company may be resolved or compensated.

So, the objective of this research is to study the relationship of intellectual capital and quality of working life and its micro-scales (sufficient and fair pay, safe and hygienic workplace, social ties of working life, continuous growth, legal positivism in labor organization, human resources development, consistent security and social integrity and solidarity) among the employees of physical education organization departments in three Northern provinces of Golestan, Gilan and Mazandaran.

METHODOLOGY

This is a correlative-descriptive research wherein the data have been collected in the field. The statistical population of research consists of the entire employees of physical education organization from the three Northern provinces of Iran as 305 of them were separately selected as samples through available sampling technique and questionnaires were distributed among all of them and the entire handed in questionnaires were deemed applicable. Research instrumentation included a questionnaire on personal particulars, Bontis' intellectual capital questionnaire and Walton's quality of working life questionnaire.

Personal particulars questionnaire: Developed by the researcher, this questionnaire would yield data such as age, gender, qualifications and work experience of employees.Bontis' intellectual capital questionnaire (1998): it consists of 52 questions reduced to 42 due to similarity of some questions as it evaluates three components of human, capital, structural capital and client capital. The validity and reliability of this questionnaire has been verified in Iran.

Walton's quality of working life questionnaire (1973): this one consists of 16 questions drafted based on the 5-point Likert scale as it measures the quality of working life in eight dimensions (sufficient and fair pay, safe and hygienic workplace, social ties of working life, continuous growth, legal positivism in labor organization, human resources development, consistent security and social integrity and solidarity). Walton reported a reliability coefficient of 0.88 for this test. Validity and reliability of this questionnaire in Iran have been verified by another research.

To determine the initial reliability, the research questionnaire was first distributed among 10 university professors and experts in this area as their comments were applied to the final edition while a pilot test was conducted on a 30-person selected sample to determine the validity of questionnaire whereby 0.87 and 0.88 Cronbach's alpha coefficients were respectively derived for the intellectual capital and quality of working life which verified the internal consistency of questionnaires.Due to the nature of the research, descriptive statistics was used to describe, classify and derive raw scores through calculation of mean values, standard deviations and plotting of diagrams while the Kolmogorov-Smirnov normality tests was used in the inferential statistics and Kendall correlation coefficient was applied to test the hypotheses. Statistical software SPSS v.21 was used to analyze the data. A significance level of α<0.05 was considered for the entire hypotheses.

RESULTS

Demographic features included: gender (70 female and 235 male), age (120 people below than 30, 125 people between 30 and 40, 60 people beyond 40), education (35 people with high school diploma, 40 people with associate degree, 195 people with bachelor degree and 35 people with master degree) and work experience (100 people with less than 5 years, 106 people between 6 and 10 years, 99 people with more than 10 years).Kolomogorov-Smirnov test was used to assess the normality of data whereby the normality of data was rejected (significance less than 0.05)Table1.

Results suggested a significant relationship between fair pay and intellectual capital of employees (0.38 Kendall correlation coefficient). ($p<0.05$).

Results suggested a significant relationship between safe workplace and intellectual capital of employees (0.42 Kendall correlation coefficient). ($p<0.05$).

Results suggested a significant relationship between secure growth and intellectual capital of employees (0.58 Kendall correlation coefficient). ($p<0.05$).

Results suggested a significant relationship between individual rights and intellectual capital of employees (0.38 Kendall correlation coefficient). ($p<0.05$).

Results suggested a significant relationship between social solidarity and intellectual capital of employees (0.56 Kendall correlation coefficient). ($p<0.05$).

Results suggested a significant relationship between lifestyle and intellectual capital of employees (0.36 Kendall correlation coefficient). ($p<0.05$).

Results suggested a significant relationship between social ties of working life and intellectual capital of employees (0.37 Kendall correlation coefficient). ($p<0.05$).

Results suggested a significant relationship between human resources development and intellectual capital of employees (0.32 Kendall correlation coefficient). ($p<0.05$).

Finally, the results between intellectual capital and quality of working life among employees is significant (0.49 Kendall correlation coefficient) ($p<0.05$).

DISCUSSION

Study of research variable and results suggested a positive significant relationship between intellectual capital and quality of working life i.e. the quality of working life and its components increases per increase in intellectual capital of employees. Considering the few research carried out on intellectual capital in behavioral sciences, no research was found with regards to determination of relationship between these two components. Intellectual capital as the intangible asset of organizations is a series of knowledge-based assets belonging to an organization and regarded as features of organization and may add value to beneficiaries and enhance the quality of their working life which leads to competitive advantage.

It should be noted that in knowledge-based economy as opposed to industry-based economy, intellectual assets are considered the most important assets and the potential success of organizations originates from their intellectual capabilities. Manpower is the backbone of intellectual capital and a significant element in value-adding of organizations and comprises all the intellectual assets such as knowledge, skill and other abilities. Therefore, management and training of intellectual capital in organizations may not only lead to competitive advantage and progression of organizational objectives but also promote internal rewards for employees which results in higher quality of working life.

Study of research variable and results suggested a positive significant relationship between intellectual capital and quality of working life and its eight micro-scales (fair pay, safe workplace, secure growth, individual rights, social solidarity, work and lifestyle, social ties of working life, development of human capabilities) i.e. the quality of working life and its components increases per increase in intellectual capital of employees. Quality of working life as a human resource-based and stimulant approach establishes balance between personal and vocational lives and

improves individuals and organizations. Enhancement of quality of life among employees requires recognition of its components. Mental perception and inference of employees of components of quality of working life represents the appropriate or poor status of organization. Taking into account the results obtained from data analysis it may be deducted that the intellectual capital is related to components of quality of working life with the highest relevance related to secure growth for employees. Security in terms of income and employment is a continuous demand of employees in different organizations and job security is a basic component in the lives of employees as the higher it is, the higher satisfaction and performance of employees will be strengthened.Following job security, intellectual capital is mostly related to social solidarity which is probably due to structural capital of the organization. The higher the level of an organization is in terms of software and hardware systems as well as concrete distributed networks, the more taskforces and collaboration will be. As a result, employees feel more belonging and their solidarity and integrity will be strengthened.

But other components of quality of working life (fair pay, safe workplace, secure growth, individual rights, social solidarity, work and lifestyle, social ties of working life, development of human capabilities) had lower than average yet significant relationship with intellectual capital.Fair pay consists of equal wages for identical tasks and proportionality of payments with criteria set by employees. Accordingly, no identical wage should be allocated for different tasks, therefore the must be a fair salary and wage disbursement at the physical education department in return for a fulfilled task such that the employees would be satisfied with their paychecks and consider their jobs as part of their lives and take pride in it. But the intellectual capital of employees has a significant effect on their interpretation of fair pay. Establishment of safe physical working conditions and also setting reasonable working hours would definitely increase job satisfaction among employees. Employees with higher intellectual capital may better resolve their mental contradictions about salary and wages and therefore create quality of working life.

Providing for freedom of speech without fear of reactions from authorities and dominance of law over human power are symptoms of particular rules and regulations of an organization that need to be observed by both directors and employees. Therefore, higher intellectual capital would lead to more employees abiding by the rules and increase in legal positivism and the employees would perceive that the adopted decisions about various vocational issues are legal and that the conditions are similar for everyone and this would enhance the quality of their working life. Social ties are the interpretation of employees of their social responsibilities within an organization, an index that has a significant and positive relationship with emotional intelligence. Employees' interpretation of social responsibility may differ from one another but they may pave the way for compatibility of individual emotion with social responsibilities. Moreover, improvement of human and individual capabilities, opportunities to progress and application of acquired skills is referred to as continuous growth. Growth and progress is the demand of majority of employees which differs based on individual capabilities and thus it would have a direct effect on the quality of their working lives

CONCLUSION

Improvement of quality of working life requires a comprehensive and extensive plan designed to meet their satisfaction, help them manage changes, retain the personnel and increase their productivity but this research showed that increase in intellectual capital as a mental construct may lead to increased quality of working life. Since directors and policy-makers of Ministry of Sports and Youth are seeking the organizational objectives and the quality of working life is one of the most influential components to that end, they may use the findings of this research to raise the quality of working life among their employees based on their intellectual capital so that they may increase job satisfaction and efficiency. Due to few research conducted in this area, these results must be interpreted with caution and further supplementary studies are still required but it was quite evident in this research that there exists a positive relationship between intellectual capital and quality of working life and its micro-scales.

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Table1.Kolomogorov-Smirnov test

Number	Significance	Test statistic	Standard variation	mean	Variable
305	<0/010	0/301	0/70	2/81	**Intellectual capital**
305	<0/010	0/280	0/78	3/07	**Quality of working life**

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RESEARCH ARTICLE

Assessment of Soil Contamination in the Area of Iron ore Choghart City Bafg using Contamination Factor, the Geoaccumulation Index and Pollution Load Index.

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ABSTRACT

Bafg of iron ore mines in the country as one of the most important in the production of industrial minerals have been exploited for a long time and to this day it continues. But with regard to sustainable development and environmental issues, the contaminated area have not been studied And lack of attention to environmental issues and lack of attention to environmental issues causes irreparable damage to the environment, especially in residential areas. This study concentrates on estimation and modeling of rating of Fe, P, S, Zn and SiO2 contents with using geostatistical approach. An exploration database was made based on data gathered from 36 samples of soil (0-20 cm depth) and also using three index of pollution factor, the Contamination Factor, the Geoaccumulation Index and Pollution Load Index.As result based on these factors, contamination of this area of interest is low to moderate that Fe is the most polluted element between others and other elements are near to border of low to moderate level of pollution. Finally, the estimation map of the study area was produced by the Pollution Load Index and Geoaccumulation Index that show the dispersion of pollution as well.

Keywords: Assessment of soil contamination, Contamination Factor, Geoaccumulation Index,Pollution Load Index, Kriging, Soil Pllution estimation, Choghart Iron mine of Bafgh.

INTRODUCTION

Entrance of any external material to water, air, soil, and earth as much as it may change their physical, chemical or biological quality so that causes damage to human or other live creatures such as plants or in other words addition of any material to the environment so that its natural balance is changed is called contamination. This contamination might be created in any parts of the environment.All of the human activities affect the environment in different ways. Among various processes of mineral activities, exploration process has the least effect on the environment and its effects are restricted to small disorders of surface scales, establishing access roads and in some more advanced stages to drilling and excavation. Since the effects of mineral operations on environment should be minimum whereas some of these effects are inevitable and they occur in every developmental activity, these effects should be decreased to the minimum amount with a proper management. But during the extraction process the effects are more severe and irreparable.One of the problems related to the activities of this mine which should be dealt with seriously is contamination caused by dusts in this area.

According to the fact that spatial analysis models in Iran are modern and they have been used for 12 years in European countries such as England as well as the United States, regarding the spatial superiority of this model, a lot of studies have been conducted in this area. The history of air pollution and its discussion backs to the middle ages and even before that. Therefore, air pollution and the established laws in this regard are not considered as a new phenomenon. Nowadays, various consequences of air pollution have led to surveillance and control of air quality as an inevitable issue around the world to be on the foremost position of the national problems. More than 4000 deaths in London in 1952 due to photochemical fogs is one of the most horrible events that have ever happened because of air pollution. Also, in 1948 in the United States, air pollution and its stability for 4 days over Donora city of Pennsylvania caused 20 deaths and 14000 ills in this city. The present study attempts to put emphasis on the areas affected by the mine activities as well as the proper method for estimating the soil contamination.

Choghart Iron Mine of Bafgh

Choghart mine is located 12 kilometers away from north east of Bafgh city, 125 kilometers away from south east of Yazd, and 75 kilometers away from south west of Behabad city. It is on the margin of Iran Desert and its weather is very hot with meager moist. The original height of Choghart mass has been 1286 meters above sea and about 150 meters higher than the area around it. This mine is connected to Tehran through 1000 kilometers railroad, 470 kilometers to Isfahan Steel Company, and 610 kilometers to Bandarabbas through Sirjan (figure 1).

Air currents are considered as effective factors on the climate of the region. In sum, 5 air currents with different characteristics affect the region's climate that because of the differences in their characteristics, sometimes they bring about abrupt changes in the climate such as the subtropical high pressure of Arezoo, western winds, long Mediterranean landing, synoptic systems of external subtropical.According to the above-mentioned cases, the major source of the precipitations of Orumyeh region is the desirable weather which along with immigrant low pressure centers penetrates to the region from western geographical sector. The conditions of frequent and connective precipitations are also present in the region during spring and fall seasons.Based on Domarton's classification, the climate of the region is dry. Therefore, during the seasons except spring and fall with the most precipitation in this region and occurrence of seasonal floods, the main reason of displacement of the polluted particles of soil is air currents.

MATERIALS AND METHODS

The data used in the operation of estimating the soil pollution include sample information from ground's surface and the topography maps.

Statistical Analysis

Statistical analysis of the raw data which are used in estimation and recognition their statistical features especially the nature of data distribution are great help in accurate estimation as well as the analysis of its achieved results (Madani, 1994).In this study, weight percent of the elements as the most important qualitative parameter of the soil pollution are taken for statistical evaluation and estimation. Gaussian statistical analysis assumes that the distribution of the data is normal. Prerequisite of some concepts of statistical ground such as using reliability of the hypotheses and sketching variogram are present on the condition of normal distribution of the data (Hasani-pak, 2000). Analyzing the histogram and normality test, it was clarified that the amounts of the two ferrous and silica are near the normal distribution but other elements such as phosphor, sulfur, and zinc were not normal. For normalizing these data, box-cox method was used. In order to discover and omit the data out of the row, Box-plot diagrams were used because existence of the amounts out of row in the data causes high increase of errors in estimation (Molayenat, 2012).

Assessing the Soil of the Region

Various criteria (contamination factor, geoaccumulation index, and pollution load index) were used in order to evaluate the amount of soil contamination with metals. Geoaccumulation index which has been introduced by Muller et al. (1969) is an index by which the degree of pollution in soil can be determined and it is calculated by the following relation:

$$Igeo = \log_2((C_n)/1/5\times B_n)$$

Based on geoaccumulation index (Igeo) of Muller C_n is the density in sediment and soil, and B_n is the density of background (Muller et al. 1969). Using the relation, geoaccumulation index was calculated for the samples of the studied soil. In order to correct the effects of the mother materials of the soil, natural fluctuation of the content of the given material in the environment, and the few made changes by human actions, coefficient of 1.5 was used. Muller has considered 6 classes for geoaccumulation indices. The unit used in pollution assessment and universal standard is (Mg/ Kg) that its amount is one in ten thousands while our assessment unit is percentage (i.e. one percent). Therefore, with multiplying our results with 100, our unit will be changed into (Mg/ Kg), too.

For determining the assessment of soil contamination with usage of pollution factor relation was used (Abrahim et al. 2008) pollution levels can be divided based on the severity of the pollution from 1 to 6 (Table 1-4).CF= [C] heavy metal/ [C] background.For analyzing the quantity of pollution risk and awareness of pollution potential in the region, combined load index of Nemerow was used (relation 2-3) (Liang et al. 2008). The advantage of this index in relation to other ones is that in this index pollution risk of all of the studied metals in the region is determined. Based on this index, the quality of soil is classified into 5 levels (Table 1-4).

$$P = \sqrt{\frac{((\frac{C_i}{S_i})\max)^2 + ((\frac{C_i}{S_i})avg)^2}{2}}$$

P is the achieved amount of pollution load index for sample C_i of measured amount of metal in each soil sample, $_i$ is each element and S_i is the amount of metal reference (background density). In order to determine the amount of soil pollution by heavy elements of a region, the density of elements of that region need to be compared with a reliable standard. The best type of comparison is the one with the present standards of the same region because various geological and climatic conditions in different parts of the world create different densities. Because there is not a special standard for degree of soil pollution in Iran, standards of other countries or universal standards (Table 2-6) are used

RESULTS

Estimation of soil contamination

For achieving the background density, mean of 25 soil random samples of the regions without any agricultural activity which were on the alluvial geological bed was used (Shahabi, 2011). The term geochemical background is defined as frequency if normality of one element in a barren and empty land or in a land without effects of human activities (McGrath et al,1995). Background density for ferrous, phosphor, sulfur, silica and zinc were 300.44, 54.55, 88.08, 4473.71, 68.84 Mg.Kg respectively.

Pollution Load Index

The results of pollution factor for ferrous, phosphor, sulfur, silica, and zinc elements are 1.95, 1.16, 1.28, 1.23, 1.07 respectively. These results revealed that most of the samples are included within the class of slight to average pollution. It should be mentioned that for ferrous element this factors is very close to 2, i.e. the pollution is average that shows the effects of open extraction and the region's soil is polluted with this element. Due to the conclusion of this index, pollution risk for ferrous element in the region is close to average pollution. The order of pollution in others metals is as follows: Fe>S>SiO2>P>Zn(Fig 14).

Pollution factor index

Based on pollution load index, the data were put in one class, i.e. class three which means pollution is low so that the amount of this index for ferrous, phosphor, sulfur, silica, and zinc elements are 1.08, 1.01, 1.03, 1.01, and 1 respectively, and all of them are between 1 to 2 (that includes number 1) (class three). Pollution of ferrous is more than the others and the least amount of pollution is for zinc. The order of pollution for the metals is as follows: Fe>S>SiO2=P>Zn

According to the density map of the elements of the region and table of density range of the heavy elements in unpolluted soils in universal scale, one can reach this conclusion that the amount of density of lead in the region is lower than 1 Mg/Kg while this amount in unpolluted soils of the world is approximately 76 Mg/Kg. this shows that the region's soil is unpolluted by this heavy metal.Khodakarami (2009) conducted a study on density of 14 heavy metals in different applications in a part of Hamedan province. The results of his study indicated that the main effective factor on increase of density in chrome, copper, nickel, and zinc in the studied region is the structure of geology, but because of heavy metals in chemical structure of urea, phosphate, and potash fertilizers, excessive usage of fertilizers on agricultural lands can be the cause of increase on density of these metals in soil (Khodakarami, 2009). (Fig.4-8)

Geoaccumulation index

The amount of geoaccumulation index indicated that the amounts of the studied elements, except in two areas of sampling for ferrous element (areas number 1 and 4), was between 0 to 1 that shows the soil was unpolluted to slightly polluted with the studied elements. Therefore, the elements' density was attributed to their natural source.
Liu et al. (2005) estimated pollution load index (PLI), Enrichment Factor (EF), and Contamination Factor (CF) in five metals including Cd, Cr, Cu, Zn, and Pb. The results of enrichment index showed that density of each metal in soil had increasing progress in comparison to background levels (EF more than 1). Pollution factor index was indicative of metal pollution during last 20 years and also pollution load index showed metal accumulation during 20 last years. The achieved amount from pollution load index and geoaccumulation index were estimated by usage of geostatistics method and the accuracy was acceptable. The achieved map from estimation of load index indicated that ferrous element had the most pollution (low to average pollution) and risk of pollution is close to average which provides

danger for the region.Other elements are on the border of clean and low to average pollution. Therefore, with environmental managements the increase of pollution should be prevented. The achieved map from estimation of geoaccumulation index showed that ferrous element has the most pollution (low pollution) and other elements have the inpolluted conditions. Also, amount of accumulation of the elements in the region indicated the increasing process of the elements in the region(Fig.9-13) and (Fig 15).

DISCUSSION

Based on the studies and analyses of this article the following results were achieved:

1. Based on the pollution load factor, most of the samples are in class of low to average pollution. It should be mentioned that for ferrous element this factor is very close to 2, i.e. the pollution is average which is indicative of open extraction effects and pollution of the region's soil with this element.
2. Amount of pollution factor index for ferrous, phosphor, sulfur, silica, and zinc is between 1 to 2 (that includes number 1) (class three). And amount of pollution of ferrous was more than the other elements while the least amount of pollution was related to zinc.
3. Geoaccumulation index indicated that the amounts of the studied elements, except in two areas of sampling, for ferrous were between 0 to 1 in other areas that shows the soil was unpolluted to slightly polluted with the studied elements. Therefore, density of the elements was attributed to their natural source.
4. The most important findings from application of metals spatial distribution map, land use map and geology of the region, in brief, show that the major factors of high density of heavy metals in the region are the present mineral materials in mine such as phosphor, ferrous (including storage place of minerals of ferrous that their phosphor percentage is very high and located on the west side of the mine) and waste materials in the mine tailings dam which is on the west side of the mine. Factors such as raining, wind blowing from north west to south and east south, as well as transportation vehicles and loading the mineral materials disperse the materials from pollution sources to the residential regions. According to spatial distribution maps, phosphor and ferrous elements have increased the risk of pollution.

SUGGESTIONS

1. As there are multivariable methods in classic statistics for estimation, with cockriging method in geostatistics estimation can be done based on correlation between various variables. This characteristic could increase the accuracy of the estimations and economize the costs (with less sampling). The areas in which there is shortage of sampling, estimation can be carried out by the help of secondary variables and usage of mutual correlation between major and secondary variables. When a number of correlated variable are estimated together, based on cockriging theory, they are in priority in relation to one-variable kriging. Even when the variables are enough available in samples, combined cockriging is better than one-variable kriging. It is suggested that for increasing the accuracy of estimation, cockriging method be used (especially for silica for which an appropriate variogram was not found).
2. It is suggested that the soil of this region be studied about other heavy metals such as cadmium, nickel, and chrome.
3. In order to blend remote sensing and geostatistics method by cockriging to increase accuracy of the estimation, in the areas without earth sampling, satellite images with high resolution can be used.

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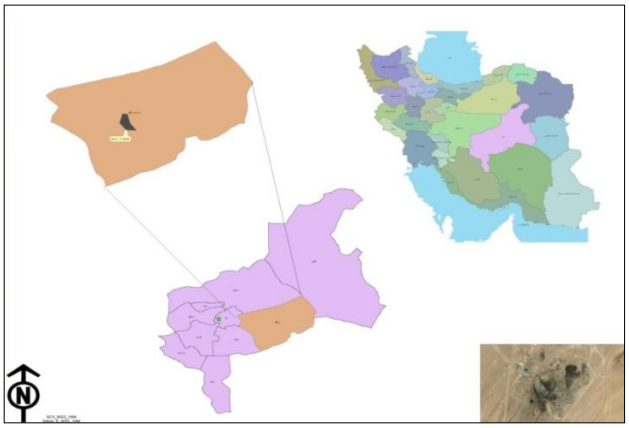

Figure 1. Geographical position of Bafgh Iron Mine

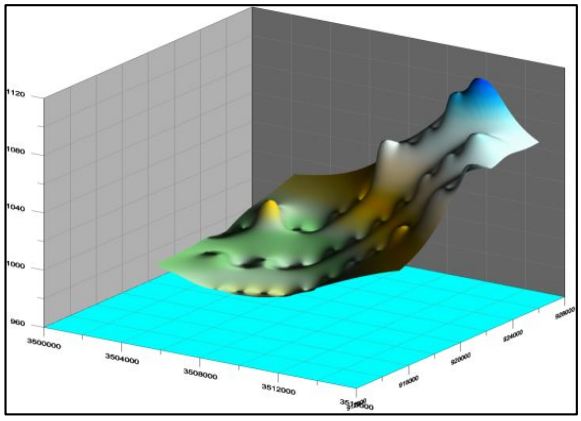

Figure 2. Topography map of the region (the mine is located on the top side of the slope and the residential region on the down side)

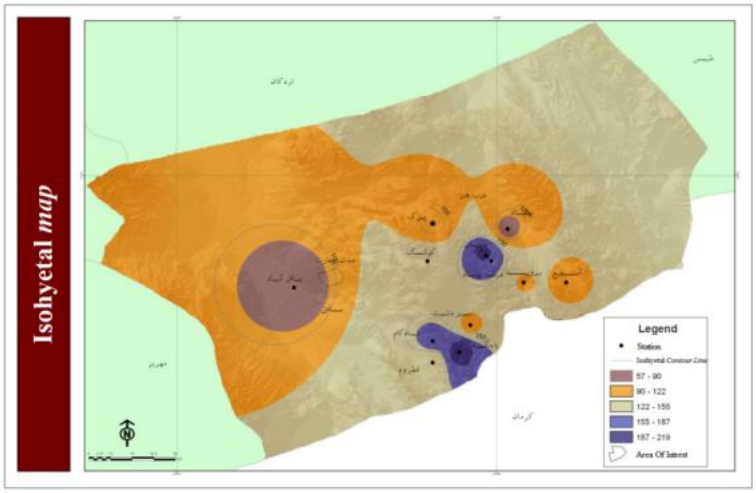

Figure 3. Precipitation map of the region

Table 1. Classifications of geoaccumulation index

Pollution degree	Geoaccumulation index
Unpolluted	0>
Unpolluted to slightly polluted	0-1
Slightly polluted	1-2
Slightly polluted to much polluted	2-3
Much polluted	3-4
Much polluted to severely polluted	4-5
Severely polluted	5<

Table 2. Classification of amounts of pollution factor (Bhuiyana et al, 2010)

Pollution degree	Amount of factor
Without pollution	0
Without pollution up to average pollution	1
Average pollution	2
Average up to heavy pollution	3
Heavy pollution	4
Heavy to very heavy pollution	5
Very heavy pollution	6

Table 3. Standardized amounts of pollution load index

Class	Pollution load index	Pollution level
Class one	$P \leq 0.7$	Excellent
Class two	$0.7 < P \leq 1$	Clean
Class three	$1 < P \leq 2$	Low pollution
Class four	$2 < P \leq 3$	Average pollution
Class five	$P > 3$	High pollution

Table 4. the range of calculated density of some heavy metals in polluted soil in universal scale (Mg/Kg) (Manta, 2002).

Average of density range		
Element	**Near the road**	**Open space**
Zinc	14.03	14.02
lead	122.90	76.46

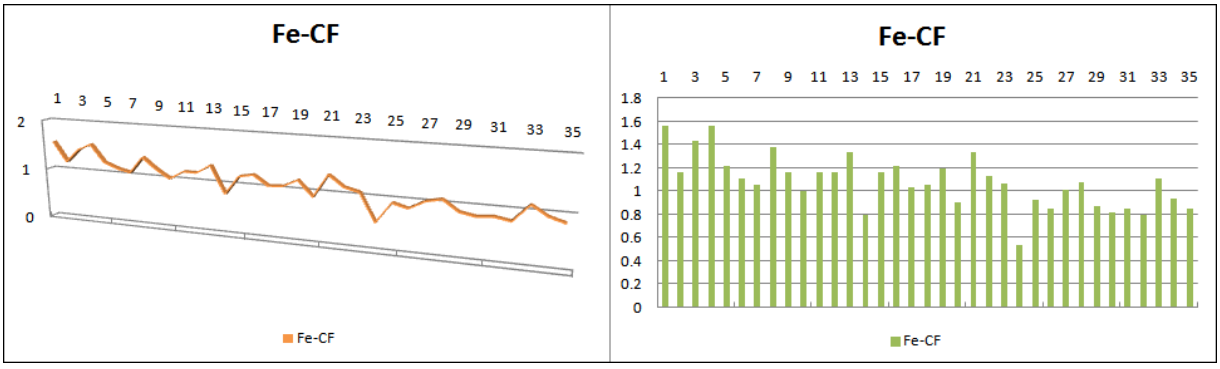

Figure 4. Amounts of pollution factor index for ferrous element in the region

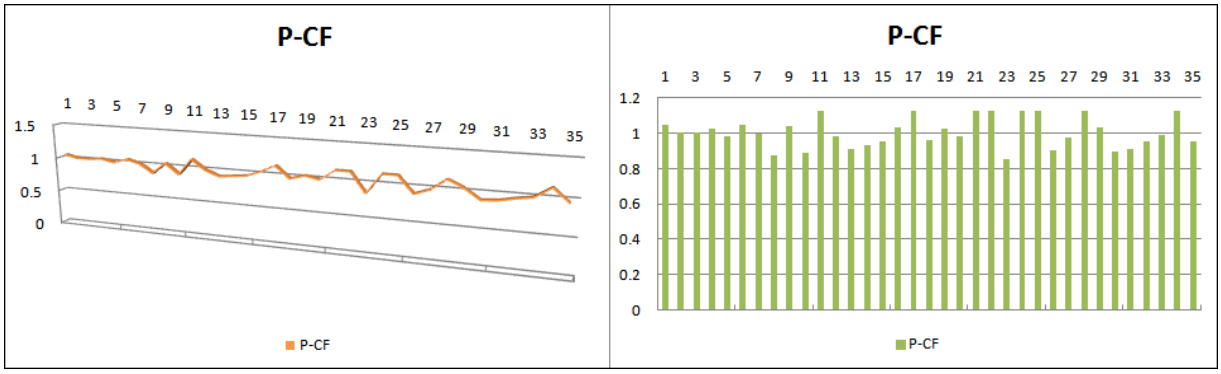

Figure 5. Amounts of pollution factor index for phosphor element in the region

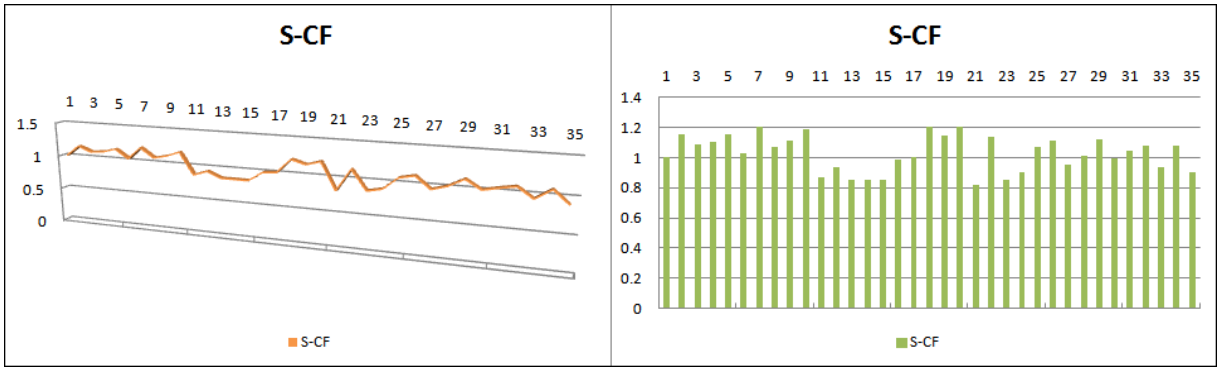

Figure 6. Amounts of pollution factor index for sulfur element in the region

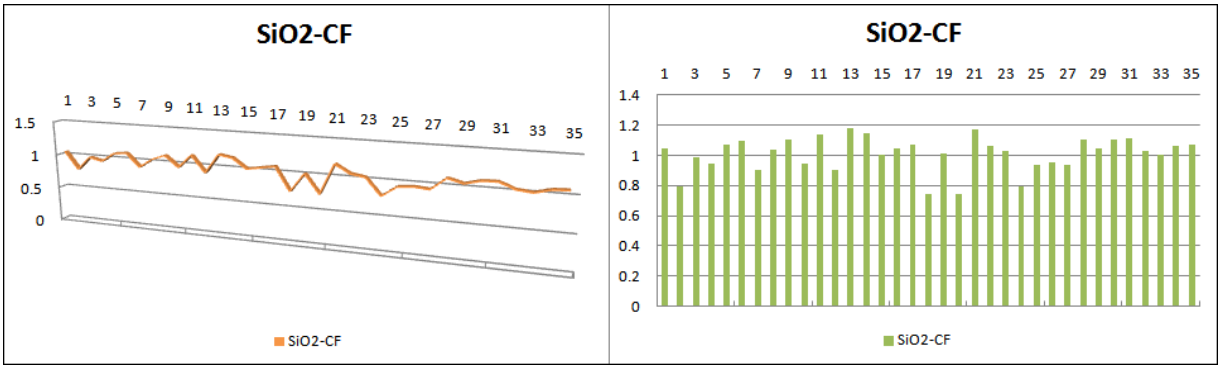

Figure 7. Amounts of pollution factor index for silica element in the region

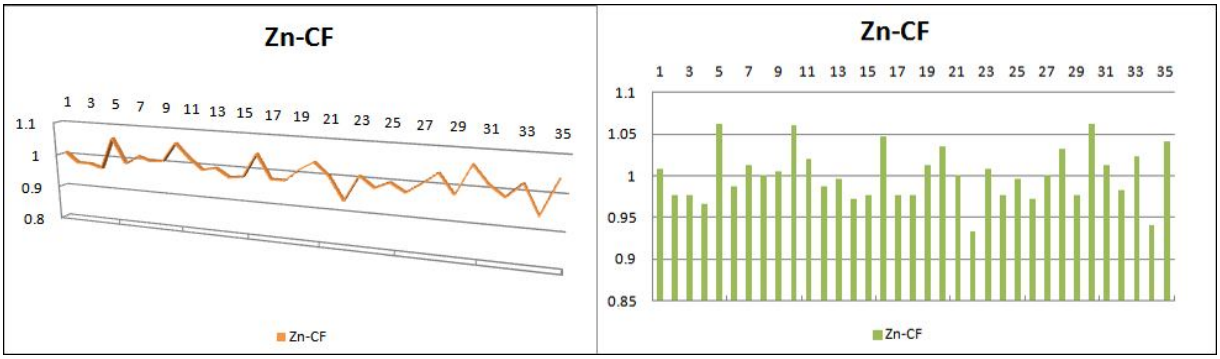

Figure 8. Amounts of pollution factor index for zinc element in the region

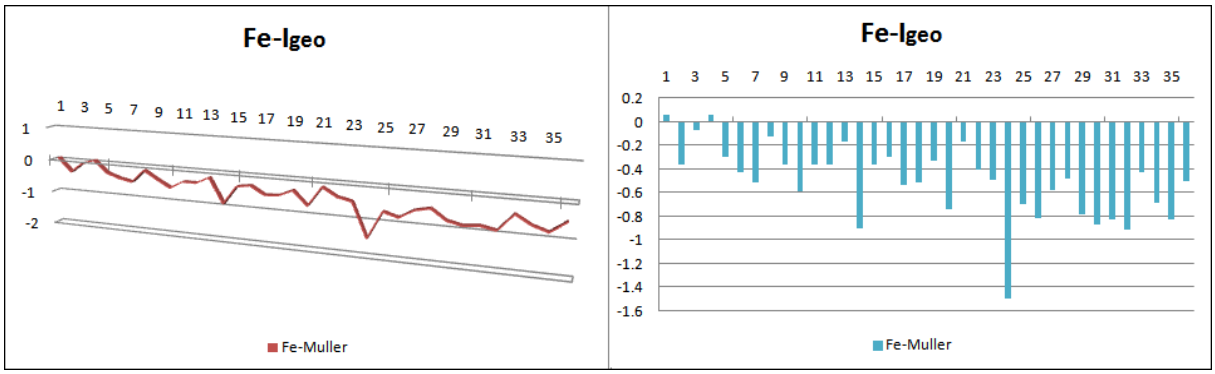

Figure 9. Amounts of geoaccumulation index of ferrous element in the region

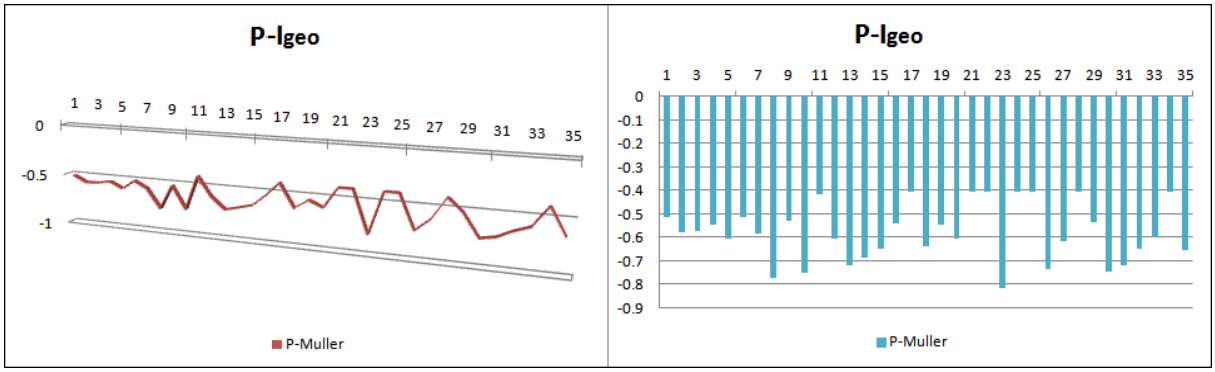

Figure 10. Amounts of geoaccumulation index of phosphor element in the region

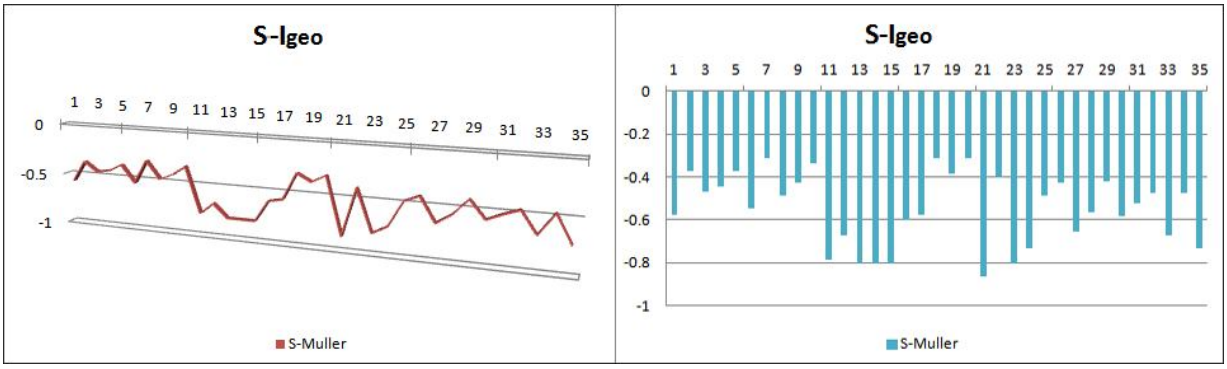

Figure 11. Amounts of geoaccumulation index of sulfur element in the region

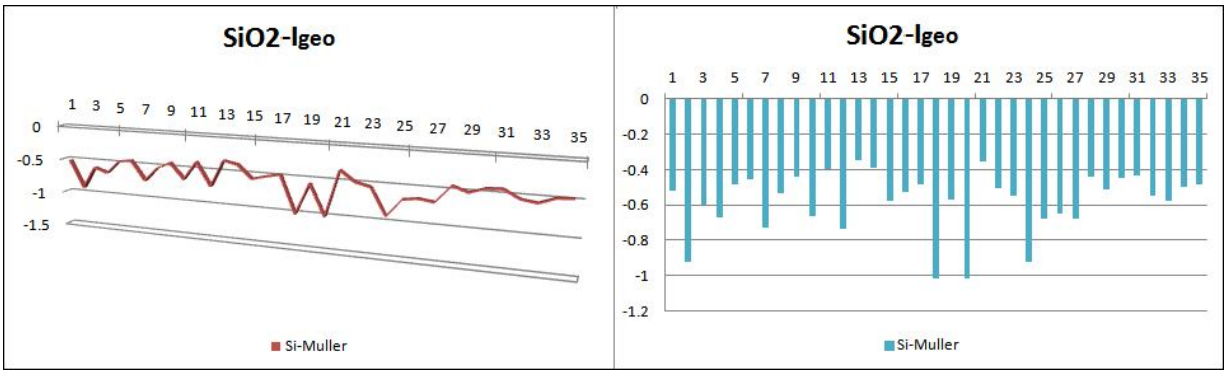

Figure 12. Amounts of geoaccumulation index of silica element in the region

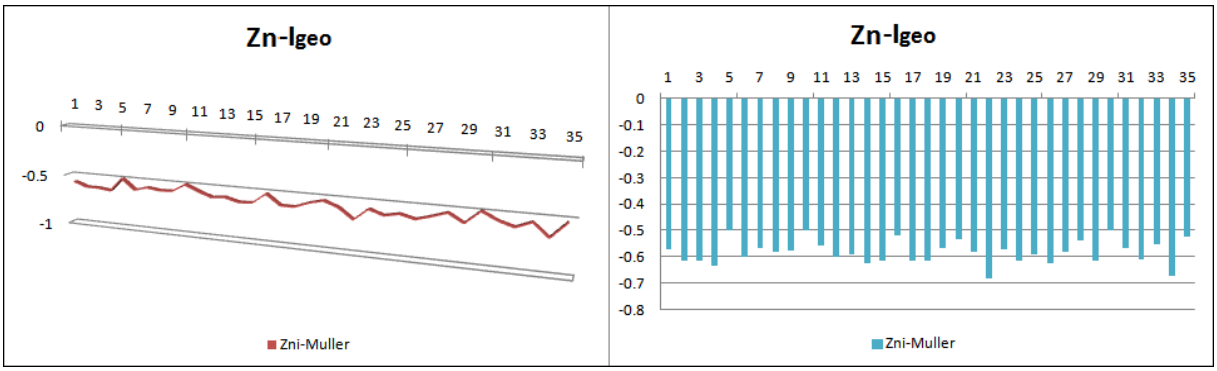

Figure 13. Amounts of geoaccumulation index of zinc element in the region

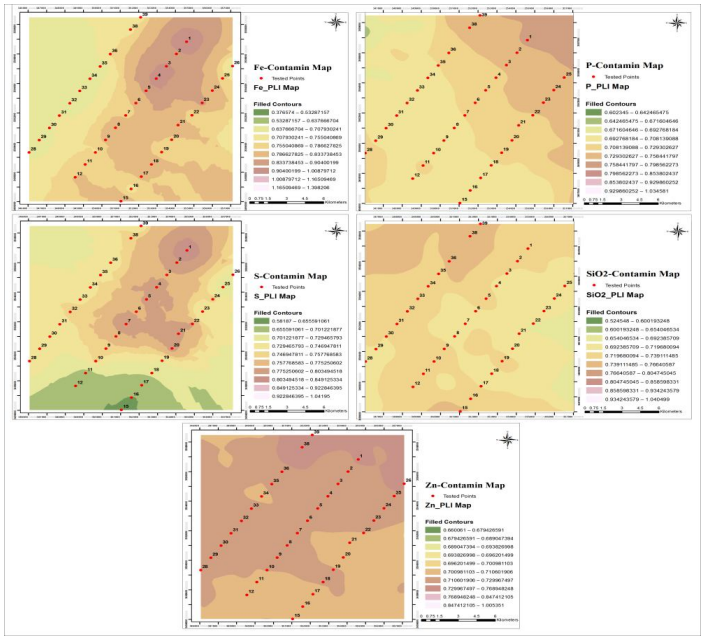

Figure 14. Estimation of Pollution Load Index in the region

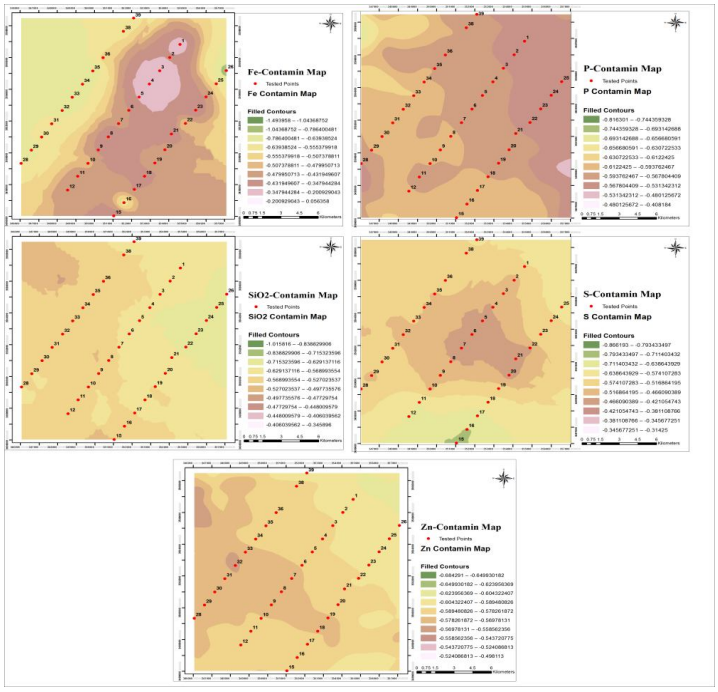

Figure 15. Estimation of Geoaccumulation Index in the region

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RESEARCH ARTICLE

Comparison of Postoperative Sore Throat in Patients Undergoing Anesthesia by Succinylcholine using Intubation and Anesthesia Mask Methods.

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ABSTRACT

Postoperative sore throat, as a side effect of anesthesia, depends on several factors such as the type of endotracheal tube and its` diameter, the use of succinylcholine, nitrous oxide and other factors. Since the recognition of these differences is very important, and a study in this regard has not been conducted in Shahroud city, in this research, we decided to study the relationship between the sore throat, with two airway instruments, endotracheal tube and facial mask.In this study, was conducted randomly as a double-blind, prospective clinical trial, on 80 patients on with class I and II ASA (American Society Of Anesthesia), whom electively underwent small Urology surgery. Patients were randomly divided into two groups of 40. After premedication and induction of anesthesia, an endotracheal tube with cuff in group 1 and the face mask in the second group were used, to provide the airway. 6 hours after surgery, patients were questioned about the presence of a sore throat and myalgia. Each patient`s information entered into the computer, and then were analyzed using version 16 of SPSS statistical software and related statistical tests such as Chi-square. In this study, P <0.05 was considered significant. The results of this study showed that the incidence of sore throat in both groups was significantly greater in males (p <0.02), and patients suffer from sore throat were aged from 50-59 years old, which significantly was different from other groups (P <0.04). About body mass index, the results of this study showed that, in

both groups (Endotracheal Tube) ETT and (Face Mask) FM, the incidence of sore throat in those who had higher BMI, was significantly greater (P <0.05). The most common jobs in two groups of patients, was housekeeping job, with 31.3% , and the most abundant educational degree in both groups were diploma and Associate's degree with 38.8%. Averagemyalgia score, in the ENDOTRACHEAL TUBE Group was 1.0± 0.2,and in the Face Mask group was 1.0 ± 0.3, that the scores were not significantly different.Also the most common myalgia status in the two groups was mid pain, which, no difference was found between the two groups. The average score of sore throat after anesthesia, was, 1.1 ± 1.8 and 1.1 ± 0.3, in the case and control groups, respectively, which significantly differed (P <0.03) and in the case group was more than the control group. About the severity of sore throat, in the endotracheal tube group, 47.5% and in the group using face masks, 12.5% of patients had various degrees of sore throat that were significantly different (P <0.03). The results showed that the incidence of postoperative sore throat using face mask considerably less than endotracheal tube, but its use has got limitations .

Keywords: Endotracheal tubes face masks, sore throat, Anesthesia.

INTRODUCTION

Postoperative sore throat or, better postoperative sore throat symptom include pain, itching, or irritation of the throat, and possibly hoarseness of voice, is considered as a minor complication of anesthesia, that usually would disappear spontaneously, within a few days after surgery (48-72 hours) [1].Postoperative sore throat may have Pharyngeal,laryngeal or tracheal origin [2]. The problem is associated with endotracheal intubation. However, it has been seen in 8% of patients that their anesthesia has been maintained with Face mask.

However, the problem also has been reported with Laryngeal mask airway as a new device used in providing the airway [1]. Several studies, factors other than the above mentioned factors are implicated in the development of postoperative sore throat and incidence of this complication has between 20 to 100 percent. But if you check the condition without asking them about their symptoms and sore throat, in this state it would be about 6% [4].As in previous studies, different results were obtained regarding the amount of sore throat after intubation, and in recent years, the use of facial mask airway is also on the rise in our country, and on the other hand , the sore throat after the operation, as a nuisance factor occurs in a significant number of patients after anesthesia, this study was designed to evaluate comparatively the occurrence of sore throat, in both airway providing methods, endotracheal tube or face mask, in the Khatamol` anbia hospital in shahroud. In general, muscle relaxants may be classified into two categories: depolarizing and non-depolarizing. Succinylcholine is the only depolarization relaxant which has got rapid onset and short duration of effect (Ultra short) [6]. Administration of 1mg/kg of succinylcholine would completely suppress, neuromuscular stimulation within 60 seconds, while non-depolarizing muscle relaxants need to do this for at least two minutes. Thus the use of succinylcholine, especially in patients who require emergency surgery and also are not NPO, is necessary in order to reduce the risk of aspiration pneumonia [7].Butiryl-cholinesterase enzyme, hydrolyzes succinylcholine. One of the effects of succinylcholine is myalgia which its` incidence differs between 0.2 to 89% . Myalgia is more common after minor surgery, especially in women and outpatients, or those, whom walk fast after the surgery compared with whom, are in bed [8]. Some researchers have found that even in the absence of succinylcholine in outpatient They would have myalgia.

Succinylcholine can cause inflammation of the throat, that its` reason, has been mentionedmyalgias, induced by pharyngolaryngealmuscles fasciculation, as a result of using this medication [8-7]. Use sub-paralytic non-depolarizing doses beforesuccinylcholine, decreasedthe incidence of sore throat from 68% to 45%. The use of an endotracheal tube which is essential to create a secure airway is associated with the sore throat [9].

However, in 8% of patients, that their anesthesia was maintained with a face mask, this effect is also seen. Sore throat, is one of the complications of anesthesia, which may be have the pharyngeal, laryngeal or tracheal origin, and could also occur in the absence of tracheal intubation [10]. Factors, which affect the incidence of sore throat, include the trachea and the cuff contact area, tracheitis due to the use of lidocaine ointment , the tracheal tube size and succinylcholine administration[9-10].

In this study, we study the myalgia and sore throat rates between the two methods of endotracheal intubation and anesthesia mask in patients for whom the same anesthetic had been used. In fact, we would see that how much is the role of endotracheal intubation,in the rate of succinylcholine-induced sore throat. In addition, by this study, the prevalence of sore throat among men and women and also in different ages could be obtained, and compared with other, and the best method of airway preparation in anesthetized patients could be chosen.The purpose of this study was to compare postoperative sore throat in patients undergoing anesthesia with succinylcholine, by two methods of intubation and anesthetic mask, which is divided into more detailed objectives:

- Comparison of postoperative sore throat in patients undergoing anesthesia with succinylcholine, by two methods of intubation and anesthesia mask in two , by sex
- Comparison of postoperative sore throat in patients undergoing anesthesia with succinylcholine, by two methods of intubation and anesthesia mask, according to the age
- Comparison of sore throat rates, after surgery in patients undergoing anesthesia with succinylcholine, by two methods of intubation and anesthesia mask, according to the duration of anesthesia
- Comparison of postoperative sore throat in patients undergoing anesthesia with succinylcholine, by intubation and anesthesia mask, according to the body mass index (BMI)

Given the above objectives, the following hypotheses are suggested:

- The incidence rate of sore throat in patients after anesthesia, especially by intra-tracheal method is reduced by increasing the patient`s age.
- Higher body mass index is a risk factor for increased sore throat complication, after anesthesia, especially by intra-tracheal intubation method.
- Succinylcholine is associated with myalgia, sore throat and hoarseness .
- Myalgia and sore throat is significantly different in patients under anesthesia by succinylcholine with endotracheal tube compared anesthesia with face mask method.

In this study it has been attempted to answer the following questions:

- Does, lower age, causes increasing the likelihood of sore throat, with endotracheal intubation?
- Doesthe use of succinylcholine is associated with increased risk of sore throat ?
- Do demographic factors such as body mass index, sex and age could be as a factor in the development of postoperative sore in these patients ?
- Isthere a significant difference between the intubation and face mask method, in the incidence of sore throat?

Up to now, several studies, about the effectiveness and relevance of the various methods of managing the airways, in order to reducing postoperative complications was performed, the results are, unfortunately, very diverse. Due to the large number of them, we explain some of these studies` results: In an articleby Dr.Menckeetal,with the title of the ways to reduce throatproblems and sore throat after anesthesia,meanwhile explaining the different stages of anesthesia and intubation importance, mentioned that both the equipment used for intubation, and also medications used in anesthesia, could cause sore throat and muscle problems, in anesthetized patients. So this is necessary to be considered, all aspects of the patient,before intubation [2]. In another study Dr. Agarwal et al, entitled, The effect of some drugs in reducing throat problems such as sore throat and hoarseness, additionally to emphasize on quick detection of problems in patients, especially in children, noted that early detection , and timely and appropriate treatment can reduce the intensity and severity of these side effects and some drugs, such as aspirin and some sedatives, can play an effective role in this regard, but these findings are not , has not been fully confirmed yet [3].In the article,by Dr. Chen and colleagues, entitled ,Factors affecting the incidence of postoperative sore throat, stated that genetic, environmental, and surgery and anesthesia factors, could cause or aggravate a sore throat, which the most important of them could be pointed , gender, weight, duration of anesthesia and the type of used airway, that

by controlling any of them,one could reduce the chance of sore throat [4]. In the article of Dr. Minoque et al, entitled, the effect of using Lidocaine gel before endotracheal intubation, for reduction of postoperative cough and sore throat, pointed out that this drug could be very helpful and simultaneously have a good effect on embedding the tube and postoperative problems, such as sore throat, hoarseness and cough. But it had been emphasized that, now it is not possible to use that, in all cases [5].

METHODOLOGY

This study is a randomized double-blind clinical trial, and conducted on 80 patients with ASA class I and II whom electivelywere undergone minor Urology surgeries (with a duration of less than one hour). Patients were randomizely, using a random number table, were studied in two groups of 40 people. Patients with a history of cardiovascular disease, hypo-and hypertension, neuromuscular disorders, high intracranial pressure, high intraocular pressure, malignant hyperthermia, hyperkalemia, background of use drugs that interfere with neuromuscular function, anesthesia class 3 and 4, different sizes of tracheal tube,using lubricants to facilitate the intubation, more than one attempt at intubation, difficult intubation, the difference in the time ofinterviewafter the surgery, the presence of diabetes, presence of addiction, changing endotracheal tube cuff pressure, having nasal-gastric tubes and pharyngitis and laryngitis before the surgery, were excluded from the study.Selection of the airwayinstrument was done randomly and patients were unaware of the used type. All patients initially were hydrated with Ringer's solution (5ml/kg) and received fentanyl (1mg/kg) and midazolam (0.015mg/kg) as premedication. Induction of anesthesia was performed with propofol (2mg/kg) and muscle relaxation with succinylcholine (2mg/kg). For anesthetic management in the group one, an endotracheal tube with cuff (ETT) and in the group two, face mask, were used. Maintenance of anesthesia was performed using propofol 10mg/kg/h, in the first 10 minutes, 8mg/kg/h inthe second 10 minutes and then end 6mg/kg/h with a mixture of nitrous oxide and oxygen,to the end of the operation.

Breathing patients during anesthesia is spontaneous, and at the end of surgery, anesthetics discontinuation and returnof airway reflexes, oral and pharyngeal secretions emptied, and the airway device was removed. 6 hours after surgery, a third person, whom did not know anything about the used airway device, attended patient`s bed side ,asked them about the myalgia and sore throat, by division. All data from patients registered at the computer, and analyzed by the associated statistical tests (chi-square) and with the SPSS software, and two groups were compared. In this study ($p < 0.05$), was considered significant.Due to determine and compare the two airway management methods, endotracheal intubation and face mask, in the sore throat incidence, within the studied patients, this study was a randomized clinical trial, that was conducted in patients needed for small surgeries, reffering to the Urology department at Khatam`olAnbya hospital of Shahrood. Urology wards and operation room in Khatam`olAnbyahospitalofShahrood were chosen for doing the research, the selection was due to the diversity of patients, and the continuous and direct presence of supervisors and counselors at the center, and access to all equipment and supplies needed for the research, as well as the presence of appropriate clinical features.All recorded data recorded into a computer and has been analyzed using SPSS statistical software. Quantitative statistics were analyzed, using average, variance, standard deviation and qualitative tests using the chi-square test(K^2). In this study, $p < 0.05$ was considered significant.

RESULTS

In this study, all patients were assessed for severity of sore throat results are presented in Table 1.The mean and standard deviation of sore throat severity of two groups is shown in Table 2.All patients were assessed for severity of muscle pain the results are presented in Table 3.The mean and standard deviation of muscle painrating for two groups is shown in Table 4. The average body mass index and standard deviation of two groups is shown in the table 5. In this study, 14 male patients (35%) formed the case group and 3 male patients (5.7%) formed the

controls group for sore throat, gender distribution results are presented in Table 6.we found that most of the age range of the patients in both groups which had a sore throat related to the age of 50-59 years. Table 7 presents the results .The mean age of the patients of two groups with standard deviationis presented in Table 8 .All patients were examined in terms of jobs. Results are provided in Table 9.all patients in the study were examined in terms of education. Results are provided in Table 10 .

Postoperative sore throat includes pain, itching, or irritation of the throat, and possibly hoarseness, is a minor complication of anesthesia which is usually removes spontaneously within a few days after the operation. The complication is associated with endotracheal intubation, but in many patients, that their anesthesia is maintained with a face mask has been also seen (11). In addition to the method of airway management in the incidence of postoperative sore throat, some anesthetic agents such as succinylcholine could also cause postoperative sore throat, that is due to myalgia, caused by Pharyngo-laryngeal muscle fasciculation (12).

DISCUSSION

In the present study, the incidence of postoperative sore throat, in the a endotracheal intubation group(ETT),was47.5% and in theface mask group(FM),was12.5%, respectively, which were significantly higher in ETT group ($p < 0.03$). In a study performed by Wong on young peopleneededminor surgeries, the incidence of severe sore throat, in endotracheal intubation with 17.5%, was much higher than the face mask with 2%[13].In the Chestnut study incidence of severe post-operative sore throat in ETT Group, was17%, and the users of face mask have been reported 3.5% .In a study by Szalados on the postoperative complications of anesthetesiain cesarean surgery, incidence of sore throat from intratracheal intubation, was 10%, and after the use of a face mask was reported 4.3%[14-15]. In a survey performed by Taboada and colleagues, entitled, Evaluation of throat pain after minor surgeries, the incidence of postoperative sore throat in endotracheal tube users, was 45.4% and in the face mask users, was expressed 3.3%, [16].In a research performed by Baker, entitled, the amount sore throat, followed by endotracheal intubation, its` incidence was reported 63.9% and in Viby-Mogensen study on women were undergoing a short time surgery, showed that the incidence of postoperative sore throat, while using face mask was significantly less, compared with ETT [17-18],thatthese results were consistent and somewhat coordinated with the findings of our study.In the recentstudy,we found that the incidence of sore throat in males in both study groups was significantly higher than in females ($p < 0.02$),that this is consistent with Kopman study finding that declared the incidence of sore throat after intubation and face mask in the males was2.3 times more than females[19]. The present study showed that in patients of endotracheal intubation group, incidence of postoperative sore throat compared with patients with face maskwas about 4 times higher ($p = 0.03$).

Postoperative mialgia is one of the unintended complications, which is seen in some patients following surgery. The exact cause is unknown, but the types of airway management, as well as some anesthetic drugs, are involved in the development of this. In 1954, the first reports of muscle pain following the use of succinylcholine was published, this clinical problem has been remained unresolved yet [20-21]. The main pathophysiology of myalgia is not fully understood, but increasing myoplasmic calcium concentration, loss of cell membrane phospholipids, fatty acids and free radicals release,are concerned to be involved in the development of myalgia [22]. To handle this problem, numerous suggestionshave been given, that among themusingdefasciculating dose of atracuriumandpropofolbefore the injection of succinylcholine, has had the best results.The results of the present study showed that the incidence of myalgias,in the endotracheal intubation group was 15%, and in face mask group was 17.5% ,respectively, thatwere not significantlydifferent.It was perhaps due to the use of midazolam and fentanyl, which were received as premedication, and may the useofpropofol [23]. Given the same circumstances between two groups, and using the same dose of succinylcholine in all patients, the most common cause of muscle pain, could be attributed to the injection of succinylcholine.

CONCLUSION

The most of the age range of the patients in both groups of sore throat was significantly 50-59 years (P <0.04).sore throat incidence, as in males was higher in both groups (P <0.02).In the term of comparison sore throat after anesthesia, we found that in the endotracheal intubation, this complication was clearly greater than the face mask(p = 0.03).The overall conclusion of this study suggest that the incidence of sore throat, especially its severetype ,in the patients using endotracheal tubes is greater than the face mask group. In our study, as in most other studies in this area, the incidence of postoperative sore throat, was considerably less, in face mask airway users compared with users of the endotracheal tube, so it is recommended for fasting patients with no underlying lung disease, whom underwent elective surgeries with duration of less than half an hour, use of face mask (FM), compared to the endotracheal tube (ETT), should be in the priority.

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Table 1. The frequency distribution of two groups`patients in terms of the severity of sore throat

Patients / Sore throat	ETTGroup Number (percent)	FMGroup Number (percent)	Total Number (percent)	p-value
Not have	21(52.5)	35(87.5)	56(70)	P<0.03
Slight	11(27.5)	4(10)	15(18.8)	
Medium	6(15)	1(2.5)	7(8.7)	
Severe	2(5)	-	2(2.5)	
Total	40(100)	40(100)	80(100)	

Table 2. Frequency distribution of the two groups in terms of mean sore

Anesthesia duration (Minutes)	Mean	Standard deviation	Minimum	Maximum	p-value
ETTGroup	1.1	1.8	0.0	3.0	P<0.03
FMGroup	0.3	1.1	0.0	2.0	

Table 3. The frequency distribution of patients into two groups according to the severity rating of muscle pain

Patients / Muscle pain	ETTGroup Number (percent)	FMGroup Number (percent)	Total Number (percent)	p-value
No pain	34(85)	33(82.5)	67(83.8)	NS
Mild pain.	4(10)	6(15)	10(12.5)	
Moderate pain	2(5)	1(2.5)	3(3.7)	
Severe pain	-	-	-	
Total	40(100)	40(100)	80(100)	

Table 4. The distribution of patients into two groups according to the severity of muscle soreness

Muscle pain(Score)	Mean	Standard deviation	Minimum	Maximum	p-value
ETTGroup	0.2	1.0	0.0	2.0	NS
FMGroup	0.3	1.0	0.0	2.0	

Table 5. The frequency distribution of the two groups of patients according to body mass index

BMI Patients	Average(kg/m²)		(kg/m²)Standard deviation		p-value
	With a sore throat	without a sore throat	With a sore throat	without a sore throat	
ETTGroup	27.2	26.1	5.5	5.3	P<0.05
FMGroup	26.7	25.9	5.7	5.5	

Table 6. The distribution of patients into two groups according to gender.

Patients Gender	ETTGroup Number (percent)		FMGroup Number (percent)		Total Number (percent)		p-value
	With a sore throat	without a sore throat	With a sore throat	without a sore throat	With a sore throat	without a sore throat	
Male	14(35)	14(35)	3(7.5)	21(52.5)	17(21.2)	35(43.8)	P<0.02
Female	5(12.5)	7(17.5)	2(5)	14(35)	7(8.8)	21(26.2)	
Total	19(47.5)	21(52.5)	5(12.5)	35(87.5)	24(30)	56(70)	

Table 7. Frequency distribution of patients according to age groups

Patients Age group	ETTGroup Number (percent)		FMGroup Number (percent)		Total Number (percent)		p-value
	With a sore throat	without a sore throat	With a sore throat	without a sore throat	With a sore throat	without a sore throat	
>30years	-	1(2.5)	-	2(5)	-	3(6.3)	P<0.04
30-39 years	1(2.5)	3(7.5)	-	3(7.5)	1(1.3)	6(7.5)	
40-49 years	3(7.5)	5(12.5)	2(5)	10(25)	5(6.3)	15(18.8)	
50-59 years	8(20)	5(12.5)	2(5)	12(30)	10(12.5)	17(21.3)	
60-69 years	4(10)	3(7.5)	1(2.5)	6(15)	5(6.3)	9(-11.3)	
>70 years	3(7.5)	4(10)	-	2(5)	3(3.8)	6(7.5)	
total	19(47.5)	21(52.5)	5(12.5)	35(87.5)	24(30)	56(70)	

Table 8. Frequency distribution according to age groups

Patients	Mean (years)	SD (years)	Minimum (years)	Maximum (years)	p-value
ETTGroup	52.37	22.65	28.0	74.0	NS
FMGroup	54.42	21.18	33.0	72.0	

Table 9. Frequency distribution of the two groups in terms of job

Patients / Job	**ETTGroup Number (percent)**	**FMGroup Number (percent)**	**Total Number (percent)**	**p-value**
Retired	8(20)	7(17.5)	17(21.3)	P<0.03
Employee	9(22.5)	11(27.5)	20(25)	
laborer	11(27.5)	9(22.5)	20(25)	
Housekeeper	12(30)	13(32.5)	25(31.3)	
Total	40(100)	40(100)	80(100)	

Table 10. Frequency distribution of the two groups in terms of education

Patients / Education	ETTGroup Number (percent)	FMGroup Number (percent)	Total Number (percent)	p-value
Less than high school diploma	8(20)	10(25)	18(22.5)	P<0.05
Diploma and above	16(40)	15(37.5)	31(38.8)	
Bachelor	12(30)	10(25)	22(27.5)	
Master's degree or higher	4(10)	5(12.5)	9(11.3)	
Total	40(100)	40(100)	80(100)	

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RESEARCH ARTICLE

Financing Mechanisms for of Rehabilitation and Reconstruction Programs of Old Urban Case Study – Shohada Square Great Plan-Mashhad City-Infrastructure).

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ABSTRACT

The urban elements and spaces, has a limited lifetime and with over time caused by the gradual deterioration because of due to human factors and physical environment need to improve and upgrade. Aside from the importance and necessity of regeneration and renewal of old tissues that is evident to everyone, this significance requires a construction macro budget and willingness of governments in the field of construction activities from one side and the expansion and distribution of schemes and plans on the other hand, have made apparent the lack of financing has worn regeneration.Therefore we should do a study on reorganization and review of mechanisms and scientific and practical solutionswith a scientific and expertise perspective of the required financing with Win-win attitude and economical system.In the present paper it is to attempt to introduce Shohada Square giant project of Mashhad City(as one of the reconstructed old arenas) in which the municipality meanwhile benefiting from different mechanisms of required finance sources begun towards the implementation of a giant project in the centre of this city, development, so that with analysis of the characteristics of each of the financing imposed mechanisms to indentify the way in which has the highest efficiency financing the expenses of the modernization of the old tissue of specific sample.The Research methodology of this article, in the dignity dimension and subjective is applied and in point analysis view is placed in the framework of descriptive and analytical research methods.

Keywords: old context, rehabilitation, reconstruction, sanitation, finance, the Shohada Square, more efficiency.

INTRODUCTION

The history of structural intervention and urban renewal is as much as the urbanization life because physical elements of urban tissue have a short life and they are subjected to changes and sometimes burnout over time. So no building or space is able to have long durability and survival without reconstruction and modernization. Urban tissues need continuous reconstruction and renovation due to gradual deterioration caused by weather and natural and devastating disasters such as earthquake, floods, avalanches or caused by human such as forest fires and interventions of rulers' desires or even residents, so city as a living organism has always healed itself. Such tissues require fundamental strategies for major changes in structural, social, economic and environmental dimensions due to problems such as low quality of life, reduced security, traffic problems, defenseless spaces, fear, high rate of crime and misdemeanor (Safari, 2010:2).

People need a context facilitating and supporting his doing work in urban spaces. Conflict between human and environment is also resulted from the gap between the two. A context that isn't able to meet its inhabitants' needs, itsliving clues are faded more and more. Worn-out textureis one of such context. There are many definitions for worn out textures every of which express measures for its quantification. However, by considering the texture as an interconnected physical entity and worn-out as a qualitative concept the intensity and creation of which are affected by many variables, we can generally consider worn out urban texture as a city or part of a city which has been impaired functionally and structurally (Kamanroodi, 2007:12).

Intervention in old fabrics in order for improving its quality of life is necessary; however, since worn out textures are devoid of economic activities due to common characteristics and welcome poor economic classes so the most fundamental problems of intervention in worn out textures are economic matters (Endalib, 2009:35). Now considering more than 60,000 hectares worn out textures in the country and a need for trillions Rial credit for renewal of them while only 2 percent of annual budget of the country is devoted to such regions, it is very important to pay attention to economic needs forreconstructing worn out urban textures and therebymethods of financing renovation projects (Hussein Abadi, 2012:236).In this regard, the first question raised in economic point of view is that how these projects will be financed? And more importantly, which financing method is performed more efficiently? In such a situation, first there must be a good understanding of the type of renovation product. In other words, it is assumed that type of approach and product expected from the renovation process has a great effect on determination of the financing method (Hassan zadeh, 2011:2).It is of note that in the present paper only those financing methods applied in the case study are discussed and due to ownership and acquisition of the project privacy, a questionnaire was formulated and evaluated for Shohada Square project's executive management and related experts.

Basic concepts

Worn-out means inefficiency and reduced performance of aurban texture relative to others. A texture and its internal components are worn out due to aging or lack of development plan and technical monitoring on its formation. The outcome of a texture being worn out which ultimately leads to the loss of its status in the minds of citizens can be manifestedin different forms including reduction or absence of environmental and safety requirements as well as structural, social, economic and infrastructural ravages (Shafaee, 2006:21).In other words, oldand inefficient urban fabrics are the regions of a city its constituent elements including infrastructure and superstructurefacilities, buildings, structures, streets and access roadshave been exhausted and become inefficient during past years and its residents suffer from such problems as social, economic, cultural and structural (law to support the restoration, rehabilitation and refurbishment of old and inefficient urban tissues).Due to the poverty of residents and owners of these tissues, its spontaneous regeneration isn't possible and investors don't have any incentive to invest in such zones (Iran's Supreme Council for Planning and Architecture).

In other words, worn out urban texturesare textures that have retarded from the process of urban development, and renewal and reconstruction of them is beyond the power of market forces and their residents (Habibi, Maghsudi 2002:15).

Fine Grained: it means that plots and dimensions of properties are small (the area of each building is less than 200m^2 in at least 50% of the buildings)

I**mpermeability**: it means lack of availability of appropriate services (relief and infrastructure) in critical conditions (width of pathways in at least 50% of buildings is less than 6m).

Instability: means lack of sufficient strength and instability of structures (at least 50% of buildings aren't resistant) (legislation of Iran's Supreme Council for Urban Development and Architecture).

Statement of the problem

Worn urban textures as a painful range of urban complex have allocated a wide area of the cities especially in metropolises and due to its main problems have turned out to be a major concern of urban managers.Obviously, planning for and implementation of reconstruction projects in such problematic areas require removing executive barriers including access to the best financing methodfor the project.Since reliance on the state and municipalities fundingfor renovating and reconstructing worn textures can hardly meet extensive investments needs in this regard, employinglargeforeign and domestic investors and developers in one hand and attracting public participation and fundraising are inevitable to realize plans of renovation and rehabilitation of worn textures. In the present research, we aimed at finding strategies to attract public micro-investments (in particular owners and residents of old tissues) as well as large investors and developers of the private section to make performing this task possible.

New financing strategies
Available financial and capital resources of investor

With regard to the type of renovation of worn textures, such resources as real estates and apartments of companies play an important role in taking the first step (ownership). Such companies canset off their existing apartments by an agreement for ownership of worn arena and texture.
There are two advantages for using this financing method:
- worn textures inhabitants often prefer to set off their property with an apartment or property rather than cash.
- having owned the lands within the worn texture, the company can easily rent it to a financer or a bank and finances financial resources for the next steps ofthe project (Jafarzadeh Najar, 2012:6).

Meter-based selling

It is a type of presale of units built but the buyer purchases a few square meters of a condominium; however, it is unclear that the area purchased is belonging to which unit.
- Afterthe construction, if the area purchased is equal to one unit, the buyer is delivered a unit otherwise Rial equivalence will be paid (Jafarzadeh Najar, 2012:7).

Presale

One of methods of financing the projects is presale of products (buildings).
- Experiences have shown that if the majority of units of a project are sold before construction, the manufacture's profit will be low; however, if there is no pre-selling,the problems of selling and capital depreciation will be arised and this will also bring down the builder's profit.

- Table adjustment in which presale is performed according to physical progress of the project is optimal. In other words, the best option is " for every percent of physical progress of the project, presale of half of it is performed" (Sharze, Daneshyar, 2011:22).

Domestic financing through the governmentor local financial institutions

a) Usinggovernmental facilities granted for worn tissues
"Such facilities should also be employed step by step in the construction project"
b) Using domestic financial institutions loans (private banks or financial institutions) (Sharzeyi, Daneshyar, 2011:23)

Foreign financing (finance)

Foreign financing (finance) is a reliable method which is currently less used in our country due to some reasons.
In this method, a borrower must provide adequate bank guarantees with the financer. 10 to 12 years is the duration of resource use and the annual interest rate is determined by economic conditions and the risk in the country which is about 1 to 4 percent above the London interbank offered rate.Due to the lower interest rate of finance than that of the banking system of the country, so it would be more profitable for recipients (Hassanzdeh, 2012:18).

banking facilities

- Banks are willing to pay their cash resources as facilitiesin variety of ways to firms and enterprises that have the ability to reimburse the loans.
- Note that immediately after receiving banking facilities, the sandglass is inverted and reimbursements will be due soon.
- It is recommended that companies that want to use banking facilities for improvement of a worn textures project, the facility is purely spent for the second step (construction) rather than the first step (ownership).
Since experiences have proven that agreement and ownership steps usually last longer than planned, it is optimal that the first step (ownership) will be operated by capital and resources of the company or other tools.
- Ifbanking facilities contracts are such that allow pre-transfer of the project products on installment is very good (Novin Capital Financing Company).

Land and Building Fund

-The Fund is established with the aims to finance certain construction projects licensed by the Securities and Exchange.
-For each project, a Fund is established and registered in the Exchange Market and its shares are supplied and traded by the Stock Market monitoring.
- After the completion of the construction project and its sale, its revenues are divided among shareholders and full settlement is done and the Fund is dissolved (Novin Capital Financing Company, 2011:15).

Bonds

It is bearer or registered bonds issued bycentral bank to finance a part of financial resources for creating, completing and developing profitable projects and entrusted to those investors who wish to participate in such schemes (Novin Capital Financing Company, 2011:12).The key factors of tendency of citizens to purchase municipal bonds are in brief: appropriate interest, high credit of the issuer and high liquidity (Marand-Yamchi 2013:25).According to the provisions of article 1 of bonds issuance Act approved in 2007, municipalities can issue bonds directly for financing a part of financial resources required for construction projects in urban renovation and improvement (jafarzadeh Najar; janati; 2012:5).

Civic participation

- Civic participation is the most common type of financing a project in which two or more natural or legal persons apply their resources in order to implement a project and each person will be the owner of the final shares according to his contribution.
- This type of participation is very common in municipalities and there are different combinations of contributions

Shares in the project

This method relied on capital-based financing is performed by attracting investors and capital and firm owners share in profit or loss of the project.In this method, by offering the project shares by issuer for a specific project, project owners become a partner and after the completion of the project, dividends are calculated and paid according to their shares. Guarantees for the repayment of the original and minimum capital profit at the end or during the implementation of the project has led to the attractiveness of this method because most of construction projects make profit after the development of some part or all of the project or presale or sale of some parts of it. In other words:
-It is similar to land and building Funds in terms of basics and principles; however, it isn't required to be listed in Stock Market and its shares aren't negotiable in it.
- Its structure is similar to a joint-stock company; each shareholder owns company stock in proportion evidenced by his or her shares and by completion of the project and division of stocks, the structure is dissolved (Norouzi, 2012:18). The method of project shareholder was first invented and implemented in the country by Eastern Region Construction and Housing Corporation. This has begun since 2004 by implementation of Sara Project at the eastern Holy Shrine of Imam Reza (website of Eastern Region Construction and Housing Corporation).

A combination of possible ways

- A project may be financed by different methods and tools.
- It is possible to combine different methods and tools; however, some of them can't be used simultaneously due to their nature (Ayinee, 2012:6).

An introduction to Shohada Square district (case study)

This district is located in the central part of the city of Mashhad in the direction of the main streets leading to the Holy Shrine. The area of the Square in this project is 22.5 hectares including three areas of Shohada Square with 13 hectares, Hasht Abad Park with 4.5 hectares and Saheb Al-Zaman Street with 5 hectares (Norouzi, 2011:3).

Analysis of pilot area financing mechanisms

Considering the research question on improving the methods and mechanisms of financing renovation of worn textures and selecting the great project of Shohada Square as a sample and pilot, all mechanisms applied in the respective projectwill be examined.Figure 2-1: the report of mechanisms of financing the great project of Shohada Square

Summary the Financial Report of the Shohada Square's Grand Plan

The starting of the Shohada Square project (studies) is since 2002 and its constructing operation has been begun cash balance of this plan till now is 8000 billion riyals (equivalent to 25000000$) the financing method of Shohada Square is as follows:

1. The Mashad municipality where is in charge of cash allocation to start the project and the non-cash construction permits during the project.
2. To take foreign loans from AB bank of Bahrin with Bank Mellatagency (Iran) amounted to 140 billion Riyals (equivalent to $43750000) in 2004 to own the part of surrounding property
3. Public Bonds that have been issued during 6 stage for 17 projects since 2005 and each year one stage of bond and a stage of bond issuance has been done and last one was in2010 and regarding Assets balance to present liabilities according to experts conducted ,the asset of 2476 billion Riyals(equivalent to $7737500) is positive balance.

The first stage Bond

The interest rate of this bond is 15.5% in 10-1-2005 amounted to 2000000000 Rials (equivalent $19996600) and until 10-1-2009 principle and interest of bonds was cleared.

The first stage Bond

The interest rate of this bond is 15.5% that was sold in 10-1-2005 amounted to 20000000000 Rials (equivalent $6250000) and until 10-1-2009 principle and interest of bonds was cleared.

The 2nd stage Bond

The interest rate of this bond is 15.5% that was sold in 8-8-2005 amounted to 3000000000000 Rials (equivalent $9375000) and until 10-1-2009 principle and interest of bonds was cleared.

The 3rd stage Bond

The interest rate of this bond is 15.5% that was sold in 10-1-2005 amounted to 153162000000 Rials (equivalent $4786313) and until 20-2-2011 the principle and interest of bonds was cleared.

The 3rd stage Bond

The interest rate of this bond is 15.5% that was sold in 10-1-2005 amounted to 153162000000 Rials (equivalent $4786313) and until 20-2-2011 the principle and interest of bonds was cleared.

The 4th stage Bond

The interest rate of this bonds is 18% that was sold in 1-2-205 amounted to 1000000000000Rials(equivalent $3125000) and until 1-5-2012 the principle and interest of bonds was cleared.

The 5th stage Bond

These bonds were sold on 6-3-2011 with interest rate of 17% that since 6-5-2011 due to central bank of Iran's policies its interest increased up to20% and was sold totally in amount of200000000000 Rilas (equivalent to $6250000) that 4th march 2015 is end of participation period.

Participation with private sector

The participation contract has been set up for 15 projects that out of them 4 cases were not reach to conclusion.
5-Sale: that will be done unit to unit or in form of the whole of building.

Share percentage of Financing-Foreign Loan-Participation Bond-Participation with private sector-Sale
Strengths and weaknesses of financing mechanisms of renovation of Shohada Square
Cash allocation of Mashhad municipality and non cash licenses issued during the implementation of the project

Mashhad municipality has contributed 110 billion Toomans as initial capital at the beginning of the project (which were mostly spent for acquisition of the ownership of preferred plots of the great project of Shohada Square) and non cash construction permits issued.

Borrowing loans from foreign banks

In 2004, the amount of 140 billion Rial loan was borrowed from ABC bank of Bahrain with the agency of Melat Bank for acquisition of the properties for the great project of Shohada Square.

Bonds

Bonds issued by Mashhad municipality were distributed from 2005 to 2010 in six steps totaling 5153 billion Rials with annual fluctuations of 15.5 to 20% in interest.

Partnerships with the private sector

Nine companies were participated in the great project of Shohada Square for 23 projects with the total value of 800 billion Rials.

METHODOLOGY

Data collection method

Data collection method in this study (considering various aspects of the topic) is a library and field research. Library method was used mainly due to theoretical framework and review of literature. Data required for measuring the situation of the studied area was collected by field research and by referring to executer and trustee of the project and by survey through the questionnaire in the appendix distributed among managers, financial experts, real estates and other management departments of the great project of Shohada Square. The questionnaire respondents were 43 people including urban managers and experts related to the renewal of the great project of Shohada Square in Mashhad. Since the ownership of theresidents' (people) properties are acquired and it is not possible to access to them so theanalysis was limited to expert opinions. To investigate the research question in SPSS software, in addition to descriptive statistics such as average, index, inferential statistics including t-student and Kolmogorov-Smirnov was used.

Research variables

In this study, the efficiency of four financing mechanisms was examined with 19 measuresof efficiency. These mechanisms include selling with 6 measures, finance with 6, bonds with4 and private sector with 5 measures. It is of note that Likert scale ranges from 1: strongly disagree, 2: disagree, 3: no idea, 4: agree, 5: strongly agree.

Validity and reliability of the questionnaire

To establish content validity of the questionnaire, experts and professionals opinions were employed. To this end, it was attempted to resolve objections of the questionnaire according to their opinions. Also, in order to verify

reliability of different questions of the research, Chronbach's alpha coefficient was used the details and values of which are shown in the below table.

Descriptive characteristics of the research population

Gender of respondents: Of 34 respondents, 82.4% was male and 17.6% was female.

Education level of respondents: 88.2% of respondents had bachelor and 11.8% associate degrees.

Respondents' tenure

According to below table, average tenure of respondents was 13.2 years and the most frequent was 10 years. Minimum tenure was 3 and maximum was 30 years with the variation range of 27.

Age of respondents

According to below table, average age of respondents was 37.6 years old and the most frequent was 35. Respondents were aged between 28 and 56 with a range up to 28 years.

Respondents' positions

According to below table, 91.2% of respondents were experts and 8.8% were managers, executive officer and administrative assistant.

Testing research question with the emphasis on the case study

As mentioned, swot technique and positive and negative aspects (strengths and weaknesses) of each financing method for renovation of the pilot zone were employed to prioritize the methods. Also a questionnaire prepared according to the project managers and experts ideas was used to this purpose.

RESULTS

Data analysis

Economic issues in the worn textures are now one of important challenges of urban management. Owners of the plots located in such areas aren't able to renovate with the minimum standards due to insufficient income and adverse economic conditions.On the other hand, limited governmental resources cannot afford the costs of renovation so it is necessary to select the best method of financing worn texture renovation. In the thesis, four financing methods other than municipality budget which were employed for implementing the great project of Shohada Square of Mashhad were measured in order to identify which method has the highest efficiency. To this end, after normalizing data distribution, one sample t-student test was used. Kolmogorov-Smirnov test was used to test the normality of data distribution. Z statistic in the test indicates normal data distribution in all four methods.
Given the scale of measurement and normal distribution of data in the population, one sample student t test was used to examine the efficiency of each mechanism. In this test, average of each mechanism was compared with theoretical mean of 3.

Selling commercial and residential units

According to below table, one sample t test was performed for testing 6 measuresof efficiency of this method for refurbishment and rehabilitation of old textures of Shohada Square.According to the results of the test shown in table 3-2, since significance level for all measures in this mechanism is less than 0.05 except for " By continuing the selling method, buyers will welcome it more " and average of all measures (average efficiency) is more than the mean (3) and on the other hand, the difference value between average and upper and lower bounds is positive for all measures of the mechanism, so the efficiency of this mechanism for financing the project of renovation of old textures of Shohada Square is considered well above the average and relatively good.

Finance (receiving loans from foreign banks)

According to below table, one sample t test was performed for testing 4measures of efficiency of this method for refurbishment and rehabilitation of old textures of Shohada Square.According to the results of the test shown in table 3-3, since significance level for all measures in this mechanism is more than 0.05 except for "Resources of foreign banks should be employed as complementary for rehabilitation of worn textures", it can be concluded that the efficiency of this mechanism for financing the project of renovation of old textures of Shohada Square is considered insignificant by managers and experts.

Bonds

According to below table, one sample t test was performed for testing 4 measures of efficiency of this method for refurbishment and rehabilitation of old textures of Shohada Square.Table 3-4: evaluating the efficiency of the mechanism of bonds in the project of renovation of old textures of Shohada Square.According to the results of the test shown in table 3-4, since significance level for all measures in this mechanism is less than 0.05 and average of all measures s (average efficiency) is more than the mean (3) and on the other hand, the difference value between average and upper and lower bounds is positive for all measures of the mechanism, so the efficiency of this mechanism for financing the project of renovation of old textures of Shohada Square is considered well above the average and relatively good.

Partnership with the private sector

According to below table, one sample t test was performed for testing 5 measures of efficiency of this method for refurbishment and rehabilitation of old textures of Shohada Square.According to the results of the test shown in table 3-5, since significance level for all measures in this mechanism is less than 0.05 and average of all measures (average efficiency) is more than the mean (3) and on the other hand, the difference value between average and upper and lower bounds is positive for all measures of the mechanism, so the efficiency of this mechanism for financing the project of renovation of old textures of Shohada Square is considered well above the average and relatively good.

CONCLUSION

As shown in the table, the average in four mechanisms was significant (sig≤0.05). In fact, according to average t-statistic value and the difference of averages being positive with 95% confidence, averagein all mechanisms is above theoretical mean 3, so according to urban experts and managers, efficiency of selling bonds is ranked first with the average of 4.12 followed by partnership with the private sector with 4.05, selling with 3.4 and finally finance with 3.26. The results of the research indicate thataccording to urban managers and expertsinvolved in the project of Shohada Square of Mashhad, bonds method is the best method in terms of efficiency and Finance (receiving loans from foreign banks) is the worst method of financing the project of renovation and refurbishment of worn textures.

The findings also indicate that Bonds is the most successful method in terms of contribution to financing such that its contribution to financing renovation and refurbishment of worn textures of Shohada Square was 74.7%. Selling commercial and residential units and partnership with the private sector with 11.6 are in the following ranks and finally there is receiving foreign loans with 2%. Below table and diagram indicate that the results of the research are consistent with the contribution of each mechanism confirming the results are close to reality.

Suggestions

Considering the place of bonds mechanism in the project of Shohada Square in terms of efficiency, the followings are suggested:By considering the location, value and municipality facilities (as a performer of innovation projects) using above methods are recommended in urban worn textures.Considering high added value of innovation of worn textures with special potential (such as around holy shrine of Imam Reza and Shohada Square project) in terms of having high economic benefits, selling bonds are recommended; however, given to the breath of respective projects, providing the possibility for selling commercial and residential units facilitate its implementation and management of the projects but profits for the project executive will be reduced.In the projects located in worn textures with low status but a very good urban position which can have high growth and value added in case of renovation, the method of selling bonds is very profitable.what mentioned was about the study and analysis of financing mechanisms of the great project of Shohada Square applied by the policy of renovation of respective area and considering the requirement of creating spaces for two subway lines passing through the Square, so for other worn textures another mechanism may be suggested.The current policies of metropolitan municipalities are provision of the continuing settlement of the residents of such areas and allocation of innovation profits to its residents and a strategy suggested for such zones is based on the participation with residents such that the contribution of owners is their properties located in the old texture, contribution of municipality is construction permits and of investor financing construction costs.

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Table 1: Municipality contributions in participation with investors

d	c	b	a	
Charges + project+ tl land	Charges + project+ pa of the land	Charges + project	Charges	Municipality contribution
construction	construction + part of tl land	The lanc construction	The land +projec construction	Investor contribution

Source: Nadim-Davoud 2009:12

Table 2 : Swot table of financial mechanism of cash allocation and non cash permits issued by municipality during the project implementation

Weaknesses (W)	Strengths)S(
Temporary reduction of municipal revenues due to issui non cash construction permits	The possibility to start the project without payment of participation profits(especially with regards to long term of the acquisition of plots in the area)
Temporary reduction of municipal revenues in the renovati area approved (due to lack of the possibility of issui construction permits)	Benefits from annual price growth of housing and construction for municipality
Changesin most of municipal policies and urban manageme influenced by changes in housing and land market and t potential inadequacy of municipal budget	Benefits from innovation of worn areas resulted from land use change to service-commercial and increased area of buildings
Changes in many municipal and urban management polici influenced by managerial changes (change of mayor ar municipal senior managers)	Benefits of price differencebetweenold buildings and modern renovated ones
Long term blockage of urban management capitals	Renovation and refurbishment of old and inefficient urban textures

(Threats) T	(Opportunities)
Inflation and increased rate construction charges	Increasing growth of real estate price
Changes in management and policies	price difference between released land and low value old texture
Natural disasters (earthquake) and failu of projects	Realization of the duty of municipality in renovation of worn urb textures

Table 3. SWOT table of financing mechanism of borrowing loans from foreign banks

Weaknesses (W)	Strengths)S(
It is granted in a certain conditions and a lengthy process	Low interest rate especially in areas with valuable historical buildings
Limited size of total foreign finance	Development of capital market in the country and district
Legal and budget constraints	Job creation
To convince lenders for granting loans requires high cost and long time	Compliance with technical and executive systems of the country (avoiding from tariffs and using tax exemption
In the conditions of economic sanctions, using such facilities may be not possible	Long repayment period of 10 to 15 years providing long term investment
The project owner should have sufficient liquidity to meet loan repayments. In most cases, loan repayment is met by the project interests. So if the project has a heavy loan it may be more profitable however there is no cash flow indicating its profit.	The project owner doesn't have to lose part of the project ownership and thereby its future profits. In fact, in this method capital financer doesn't have any control on how the project is implemented and only wants the timely repayment of the interest and original loan
To guarantee repayment of borrowed loan, it is necessary to hypothecate adequate collateral and technical skill and knowledge aren't transferred completely.	Using borrowed funds to finance the project allows the interests to be remained in the company or transferred to shareholders. Interest rate of loan borrowed is paid before calculating tax so tax becomes less.
	Development of the services and goods market

Threats) T(	Opportunities) O(
Inflation and increased price of constructi materials and costs	Increasing growth of real estate price
Changes in management and policies	price difference between released land and low value old texture
Sanctions and increased price of foreign currenc	
Natural disasters (earthquake)	

Table 4. SWOT table of financing mechanism of bonds

Weaknesses (W)	Strengths)S(
Brokerage fees reduce part of interest paid by companies to bonds holders	This method has the highest level of participation and funding contribution (over 515 billion Toomans)
If the project isn't profitable, repayment of the original and interest of bonds is a problem	This method has the highest economic rate of return

To guarantee repayment of borrowed loan, it is necessary to hypothecate adequate collateral	It is in the second rank after selling in terms of ease of implementation
The project owner should have enough cash to repay participation profits	Using borrowed funds to finance the project leads to the project interests be remained in the company or transfered to shareholders
Sale price of the bonds is based on nominal price rather than market price	Interest rate of loan borrowed is paid before calculating tax so tax becomes less.
In most cases, loan repayment is met by the project interests. So if the project has a heavy loan it may be more profitable however there is no cash flow indicating its profit.	The project owner doesn't have to lose part of the project ownership and thereby its future profits. In fact, in this method capital financer doesn't have any control on how the project is implemented and only wants the timely repayment of the interest and original loan
Despite the familiarity of investors with government bonds, they still don't have a clear picture of company bonds which are traded in Stock Exchange	If interests repaid in these bonds are more than interests of financing banks it is ruled out automatically so for enforcement it is necessary to the interest be proportional to rival markets conditions.
	Securities Act is the first legislation appeared with strong legal backing.

Threats) T(	**Opportunities) O(**
Inflation and increased price of constructi materials and costs	Increasing growth of real estate price
Changes in management and policies	price difference between released land and low value o texture
Sanctions and Natural disasters (earthquake)	

Table .5 SWOT table of financingmechanism of partnerships with the private sector

Weaknesses (W)	**Strengths)S(**
By participating in a project, some part of management rights and autonomy in decision making is lost. Ideas of other partners may be different from the municipality.	Increased work safety considering increased monitors on proper execution of the project
Pre-tax profits are paid to partners so tax is higher than that of the method of financing the debt.	In case of failure of the project, there is no need to repay the funds received
In this method, complete ownership of the project is lost and the project benefits are shared with other investors	The project has high liquidity since there is no need to debt service
	variety of construction and management methods
	A project with adequate capital is more attractive for lenders and investors
	There is no need to hypothecate the project assets or the company

Threats) T(	**Opportunities) O(**
Inflation and increased price of construction materia and costs	Increasing growth of real estate price
Potential disagreements between partners abo construction, investment, etc.	price difference between released land and low value old texture
Changes in management and policies, sanctions	

Table 6.SWOT table of financing mechanism of transferring (selling)

Weaknesses (W)	**Strengths)S(**
By selling a share percent of a project, some part of management rights and autonomy in decision making is lost. Ideas of other partners may be different from the project owner.	The best method in terms of ease of implementation and according to the managers of great project of Shohda Square, it is the most logical and appropriate way to finance the project.
In this method, complete ownership on the project is lost and the project benefits are shared with other investors	If it is used, the project has a high liquidity so there is no need to debt services.
Interest and added value of refurbishment of old textures are shared by purchasers.	Pre-sale has the highest economic return rate after bonds.
	There is no need to hypothecate the project assets
——	In case of failure of the project, there is no need to repay the funds received
	A project with adequate capital is more attractive for lenders and investors
Threats) T(	**Opportunities) O(**
Disagreements between partners about constructio investment, etc.	Increasing growth of real estate price
Limitations on essential reforms during the implementati of the project due to possible opposition of some buyers	Price difference between released land and low value o texture
Inflation and increased price of construction materials ar costs	
Changes in management and policies and Sanctions	
Natural disasters (earthquake)	

Table 7. Efficiency measures of financing mechanisms of the project studied in the research

Mechanism efficiency measure	**Mechanism**
Selling is the best method in terms of administrative cycle and ease of implementation	**Selling**
The implementation of this method has been successful in renovation projects	
By continuing the selling method, buyers will welcome it more	
There is currently enforcement mechanisms of this method in urban management	
Mechanism of action of this method has a good efficiency in urban management	
Urban management has positive approach to implement this method for financing	
Receiving loans from foreign banks and institutions is the best method in terms of ease of implementation in urban management	**Finance**
Foreign banks have cooperated with urban management to impalement this method for renovation of old textures	
Resources of foreign banks should be employed as complementary for rehabilitation of worn textures	
The implementation of this method has been successful in renovation projects	
Bonds method can be implemented easily in urban management	**Bonds**
Issuing bonds is the most common method of financing in urban projects	
Urban managers have a strong tendency to implement this method	
The implementation of this method has been successful in renovation projects	
If the government or municipality purchases the property and perform renovation with the	**Pa tne rsh ip wi h the**

help of private sector is optimal	
Partnership with the private sector method accelerates the renovation	
Appropriate mechanism can be created by this method for renovation projects in urban management	
By this method, urban management can provide more services to the residents of worn textures	
This method is easier than others to implement in urban management	

Table 8. Reliability coefficients of the structures

Questionnaires		Mechanisms
Reliability coefficient	**Number of items**	
0.86	6	**Selling**
0.53	4	**Finance**
0.79	4	**Bonds**
0.82	5	**Partnership with the private sector**
0.80	19	**Total**

Table 9. Gender of respondents

Percent	Number	Gender
82.4	28	**Male**
17.6	6	**Female**
100.0	34	**Total**

Table 10.Education level of respondents

Percent	Number	Education level
88.2	30	**Bachelor and higher**
11.8	4	**Associate**
100.0	34	**Total**

Table 11: Respondents' tenure

Variation range	Maximum	Minimum	Index	Average	Variable
27	30	3	10	13.2	**Tenure**

Table 12.Age of Respondents

Variation range	Maximum	Minimum	Index	Average	Variable
28	56	28	35	37.6	**Age**

Table 13: Respondents' positions

Percent	Number	Position
91.2	31	**Expert**
.2.9	1	**Manager**
2.9	1	**Executive officer**
2.9	1	**Administrative assistant**
100	34	**Total**

Table 14. Qualitative and quantitative assessment of respondents by measures defined in financing mechanisms

Chi-square statistics	Strongest disagree	disagree	No idea	agree	Strongly agree	measures	Method
0.021	0	17.6	23.5	47.1	11.8	Selling is the best method in terms of administrative cycle and ease of implementation	Selling
0.013	0	17.6	35.3	41.2	5.9	The implementation of this method has been successful in renovation projects	
0.000	5.9	23.5	11.8	58.8	0	By continuing the selling method, buyers will welcome it more	
0.000	0	5.9	23.5	70	0	There is currently enforcement mechanisms of this method in urban management	
0.05	0	23.5	23.5	52.9	0	Mechanism of action of this method has a good efficiency in urban management	
0.003	0	0	29.4	58.8	11.8	Urban management has positive approach to implement this method for financing	
0.249	0	35.3	29.4	23.5	11.8	Receiving loans from foreign banks and institutions is the best method in terms of ease of implementation in urban management	Finance
0.013	0	35.3	52.9	11.8	0	Foreign banks have cooperated with urban management to impalement this method for renovation of old textures	
0.000	0	5.9	11.8	70.6	11.8	Resources of foreign banks should be employed as complementary for rehabilitation of worn textures	
0.032	0	23.5	41.2	29.4	5.9	The implementation of this method has been successful in renovation projects	
0.002	0	11.8	5.9	41.2	41.2	Bonds method can be implemented easily in urban management	Bonds
0.013	0	17.6	5.9	35.3	41.2	Issuing bonds is the most common method of financing in urban projects	

0.049	0	5.9	35.3	23.5	35.3	Urban managers have a strong tendency to implement this method	
0.03	0	0	0	58.8	41.2	The implementation of this method has been successful in renovation projects	
0.002	0	6.3	12.5	50	31.3	If the government or municipality purchases the property and perform renovation with the help of private sector is optimal	**Partnerships with the private**
0.001	0	0	5.9	58.8	35.3	Partnership with the private sector method accelerates the renovation	
0.003	0	0	11.8	57.8	29.4	Appropriate mechanism can be created by this method for renovation projects in urban management	
0.000	0	5.9	11.8	52.9	29.4	By this method, urban management can provide more services to the residents of worn textures	
0.006	0	5.9	47.1	17.6	29.4	This method is easier than others to implement in urban management	

Table 15: Testing normalization of distribution of traits in the population

Result	Kolmogorov-Smirnovz	Financing methods
Normal	0.277	**Selling**
Normal	0.277	**Finance**
Normal	0.135	**Bonds**
Normal	0.287	**Partnerships with the private sector**

Table 16.evaluating the efficiency of the mechanism of selling commercial and residential units in the project of renovation of old textures of Shohada Square

Test Value = 3							measures	
95% Confidence Interval of the Difference		**Mean Difference**	**Sig. (2-tailed)**	**t**	**Std. Deviation**	**Mean**		
Upper	**Lower**							
.8535	.2053	.52941	.002	3.323	.92884	3.5294	Selling is the best method in terms of administrative cycle and ease of implementation	**Mechanism**
.6490	.0568	.35294	.021	2.425	.84861	3.3529	The implementation of this method has been successful in renovation projects	
.5901	-.1195	.23529	.186	1.349	1.01679	3.2353	By continuing the selling method, buyers will welcome it more	
.8554	.4387	.64706	.000	6.319	.59708	3.6471	There is currently enforcement mechanisms of this method in urban management	**Selling**

.5858	.0025	.29412	.048	2.052	.83591	3.2941	Mechanism of action of this method has a good efficiency in urban management	
1.0420	.6050	.82353	.000	7.668	.62622	3.8235	Urban management has positive approach to implement this method for financing	

Resource: findings of research 2014

Table 17.Evaluating the efficiency of the mechanism of Finance in the project of renovation of old textures of Shohada Square

Test Value = 3							Measures	
95% Confidence Interval of the Difference		**Mean Difference**	**Sig. (2-tailed)**	**t**	**Std. Deviation**	**Mean**		
Upper	**Lower**							
.4797	-.2444	.11765	.513	.661	1.03762	3.1176	Receiving loans from foreign banks and institutions is the best method in terms of ease of implementation in urban management	**Mechanism**
.2010	-.4363	-.11765	.458	-.751	.91336	2.8824	Foreign banks have cooperated with urban management to impalement this method for renovation of old textures	
1.1217	.6430	.88235	.000	7.500	.68599	3.8824	Resources of foreign banks should be employed as complementary for rehabilitation of worn textures	
.4798	-.1269	.17647	.245	1.184	.86936	3.1765	The implementation of this method has been successful in renovation projects	**Finance**

Source: findings of research 2014

Table 18. Evaluating the efficiency of the mechanism of bonds in the project of renovation of old textures of Shohada Square.

Test Value = 3							measures	Mechanism
95% Confidence Interval of the Difference		Mean Difference	Sig. (2-tailed)	t	Std. Deviation	Mean		
Upper	Lower							
1.4587	.7766	1.11765	.000	6.667	.97746	4.1176	Bonds method can be implemented easily in urban management	Bonds
1.3841	.6159	1.00000	.000	5.296	1.10096	4.0000	Issuing bonds is the most common method of financing in urban projects	
1.2234	.5413	.88235	.000	5.264	.97746	3.8824	Urban managers have a strong tendency to implement this method	
1.5861	1.2375	1.41176	.000	16.479	.49955	4.4118	The implementation of this method has been successful in renovation projects	

Source: findings of research 2014

Table 19. Evaluating the efficiency of the mechanism of partnership with the private sector in the project of renovation of old textures of Shohada Square.

Test Value = 3							Measure	Mechanism
95% Confidence Interval of the Difference		Mean Difference	Sig. (2-tailed)	t	Std. Deviation	Mean		
Upper	Lower							
1.3654	.7596	1.06250	.000	7.155	.84003	4.0625	If the government or municipality purchases the property and perform renovation with the help of private sector is optimal	partnership with the private sector
1.4961	1.0921	1.29412	.000	13.035	.57889	4.2941	Partnership with the private sector method accelerates the renovation	
1.3950	.9580	1.17647	.000	10.954	.62622	4.1765	Appropriate mechanism can be created by this method for renovation projects in urban management	
1.3429	.7747	1.05882	.000	7.582	.81431	4.0588	By this method, urban management can provide more services to the residents of worn textures	
1.0444	.3674	.70588	.000	4.243	.97014	3.7059	This method is easier than others to implement in urban management	

Source: findings of research 2014

Table 20.Evaluating the efficiency of the mechanisms

Test Value = 3							Financing mechanism
95% Confidence Interval of the Difference		Mean Difference	Sig. (2-tailed)	t	Std. Deviation	Mean	
Upper	Lower						
.7002	.2606	.48039	.000	4.446	.63001	3.480	Selling commercial and residential units
.4430	.0864	.26471	.005	3.020	.51102	3.264	Finance
1.3535	.8524	1.10294	.000	8.956	.71805	4.120	Bonds
1.2659	.8341	1.05000	.000	9.917	.59892	4.050	partnership with the private sector

Table 21. Comparison of efficiency and contribution of the mechanisms in financing the project of innovation of worn textures of Shohada Square.

Efficiency of mechanism		Contribution to financing			Financing mechanism
Rank	Average	Rank	Percent	Amount in billion Rial	
3	3.5	2	11.7	807	Selling commercial and residential units
4	3.3	4	2	140	Finance
1	4.1	1	74.7	5153	Bonds
2	4.05	3	11.6	800	Partnership with the private sector

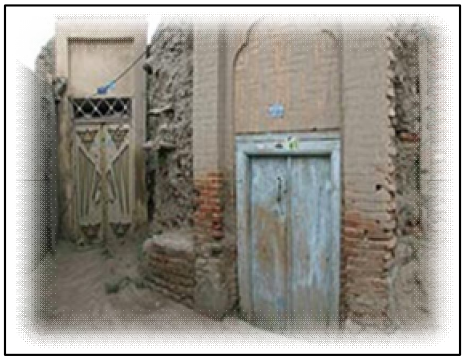

Figure 1: An example of worn urban areas.
Source: Setude Elmbaz,2010

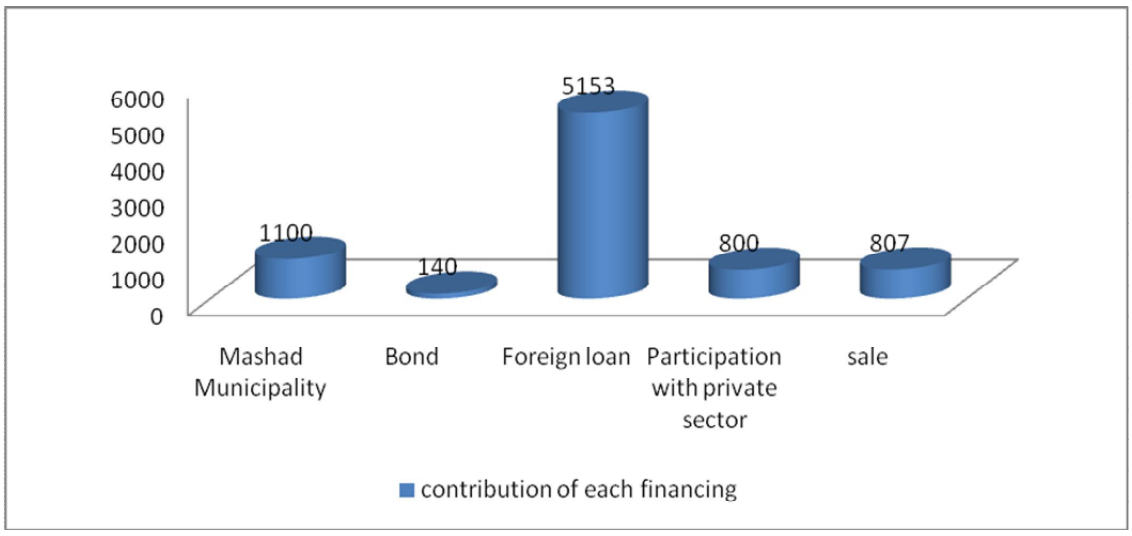

Figure 2. Contribution of each financing mechanism of the pilot area to a capital of 8000 billion Rial.

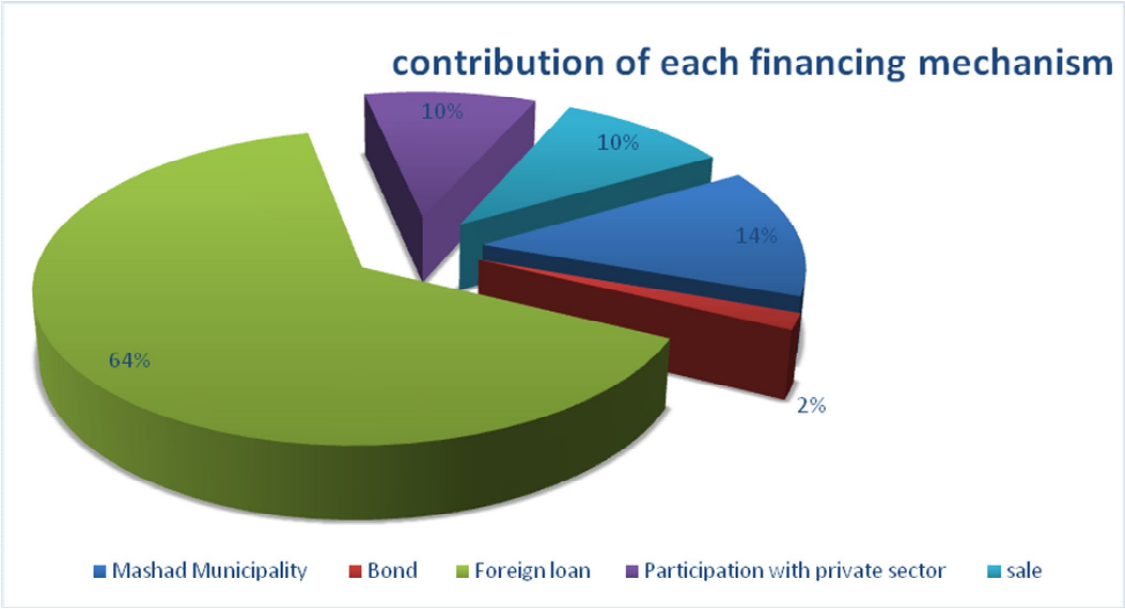

Figure 2.1 Contribution of each financing mechanism

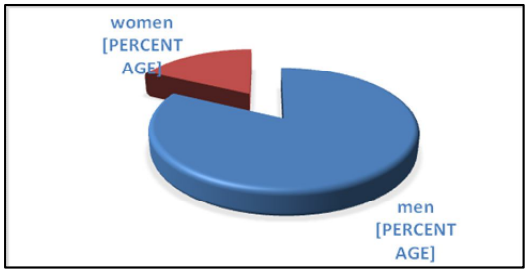

Figure 3. Respondents' percent Women-men

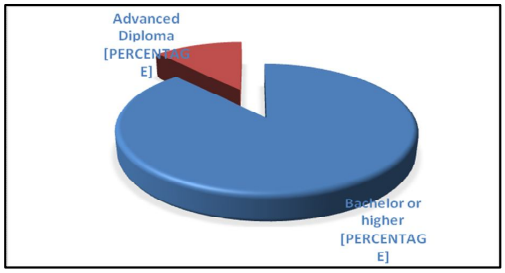

Figure 4.Education level of respondents Undergraduate- Graduate and above

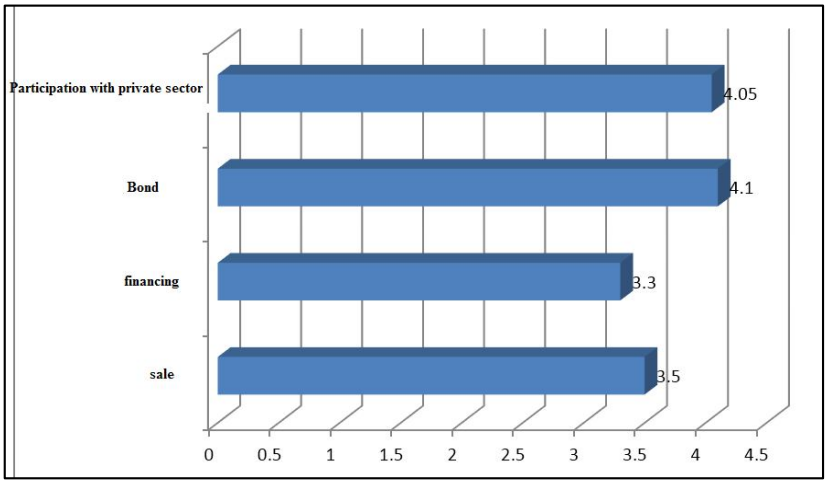

Figure 5: Evaluating the efficiency of the mechanisms

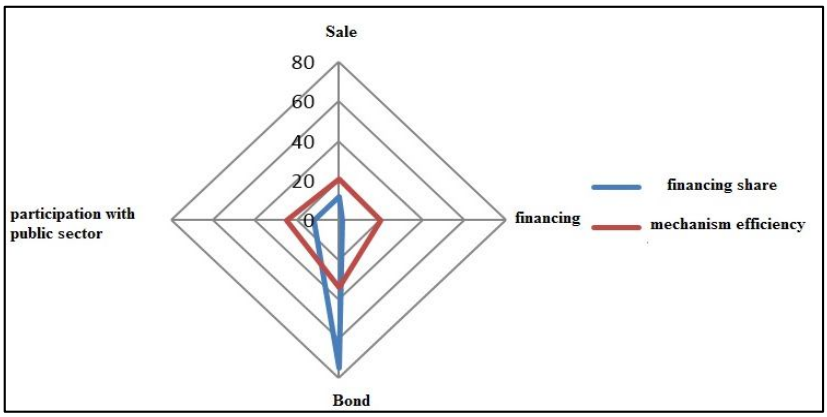

Figure 6 : Comparison of efficiency and contribution of the mechanisms in financing the project of innovation of worn textures of Shohada Square.

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RESEARCH ARTICLE

Development and Validation of a Passive Haemagglutination Assay for Detection of Leptospiral Antibodies in Animals and Man.

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ABSTRACT

A Passive Haemagglutinaton Assay (PHA) was standardized for detection of leptospiral antibodies in animals and man. The PHA was carried out using sheep RBCs sensitized with Erythrocyte Sensitizing Substance (ESS) as antigen. The ESS was prepared by ethanol precipitation of cultures of *Leptospira interrogans* serovar Pyrogenes and *Leptospira biflexa* serovar Patoc. Sera from 104 canines, 74 bovines and 154 human beings were subjected to Passive Haemagglutination Assay (PHA) and the results were compared with indirect IgG ELISA. The PHA detected leptospiral antibodies in 50 per cent canines, 18.91 per cent cattle and 42.85 per cent human beings .The relative sensitivity of PHA to ELISA, in detecting leptospiral antibodies, was 71.42 per cent in canines, 62.5 per cent in human beings and 25 per cent in cattle. The PHA proved to be an effective test for rapid diagnosis of acute leptospirosis in canines.

Keywords: Passive Haemagglutinaton Assay, Erythrocyte sensitizing substance, IgG ELISA, Relative sensitivity, leptospirosis.

INTRODUCTION

Leptospirosis is an infection that is capable of incapacitating even the stringiest of control and preventive measures adopted. This is due to the prevalence of numerous serovars of pathogenic *Leptospira* (more than 225 for *L.interrogans*) circulating in the environment [1]. Each serovar generates an unique antigenic response due the variable lipopolysaccharide(LPS) moiety present in its outer membrane which has exposed epitopes depending on their sugar composition and orientation [1]. The PHA is a genus specific test and this specificity is contributed by the carbohydrate moiety in the ESS [2]. Specific IgM antibodies are detected in the sera of patients from the second day of infection and can persist upto 12 months [4].The PHA mainly detects IgM antibodies in the sera [3] and hence can be used for the diagnosis of acute infections.

MATERIALS AND METHODS

The ESS was prepared as per [5] with minor modifications. *Leptospira interrogans* serovar Pyrogenes and *Leptospira biflexa* serovar Patoc were grown in 100 ml volumes in EMJH liquid media for seven to ten days dispensed in 10 ml volumes and centrifuged at 18000 × g for 45 minutes. The sediments were pooled and suspended in five milliliters of phosphate buffered saline (PBS). To this 0.25 g of sodium tauro cholate was added, mixed to dissolve and incubated first at 37°C for two hours and then at 4°C for 20 hours. Following incubation, the *Leptospira*-bile salt mixture was added to 45 ml of absolute alcohol and kept for flocculation at 4°C for two hours. The precipitate was collected by centrifugation at 200× g for five minutes and resuspended in five milliliter PBS. The resulting faintly turbid solution constituted the leptospiral ESS. The optimum concentration of ESS required for maximum sensitization of sheep RBC (SRBC) was arrived at by checker board titration using rabbit hyper immune sera raised against *Leptospira interrogans* serovar Pyrogenes. The optimum dilution of the ESS (1:2) was the highest dilution of the ESS, when coated on to the sheep RBC showed haemagglutination with the highest dilution of the hyper immune sera.

Sheep blood, collected in Alsever's solution was washed thrice by centrifugation in PBS and resuspended in PBS to yield a 10 per cent suspension. To one milliliter of the 1:2 diluted suspension of ESS, 0.1 ml of 10 per cent SRBC was added and the mixture was allowed to react in a 37°C water bath for one hour with intermittent shaking. The sensitized SRBC was washed thrice in PBS and resuspended in one milliliter of PBS.Sera samples collected from 104 dogs, 74 cattle and 154 human beings were subjected to PHA and indirect IgG ELISA. The PHA test proper was carried out as per [3] with minor modifications. Serial two fold dilutions of the sera in PBS were taken in 20 µl quantities in U bottomed microtitre plates to provide dilutions of 1:8 to 1:4090. Five microlitre of the sensitized SRBC was added to each well and the plates were gently tapped and incubated first at 37°C for one hour and then at room temperature for 20 hours.The endpoint was noted as the highest dilution of the serum showing haemagglutination.Indirect IgG ELISA was performed as reported earlier [6].The results were analyzed for percentage agreement and relative sensitivity and specificity by Kappa (κ) statistics as per [7].

RESULTS

PHA

A titre of 1:32 and above was considered as positive in dog, cattle and human sera .The PHA detected a prevalence of 50 per cent in canines with the highest titre of 1:512, 18.91 per cent in bovines with a maximum titre of 1:128 and 42.85 per cent in human beings with highest recorded titre of 1:512 (fig.1).

ELISA

The ELISA detected a prevalence of 53.84 per cent in dogs, 64.86 per cent in cattle and 62.33 per cent in human beings (fig 1).

STATISTICAL ANALYSIS

Percentage of agreement between the two tests showed kappa values above 0.9 ($\kappa > 0.9$) for each species tested. Relative sensitivity and specificity of PHA to ELISA, and ELISA to PHA in dog, cattle and human sera is given in Table.1a and Table 1b respectively.

Comparison of results of PHA and ELISA

Comparison of results of PHA and ELISA is given in Table.2. Out of the 332, canine, bovine and human sera samples, 112 were tested positive and negative by PHA and ELISA. Twenty PHA positive samples tested negative by ELISA while 88 ELISA positive samples tested as negative by PHA. In cattle, none of the ELISA negative sera gave positive results by MAT where as in dogs and humans four of the ELISA negative sera gave positive results by MAT.

DISCUSSION

Prevalence of leptospirosis in dogs, cattle and human beings as detected by PHA were 50 per cent, 18.91 per cent and 42.85 per cent respectively.A maximum titre of 1:512 was recorded against canine and human sera while in cattle a maximum titre of 1:128 was recorded. A maximum titre of 1:64 in cattle using sonicated leptospiral antigen was detected by [8], who opined that titres of 1:16 or below indicated an infection which might have occurred two months earlier whereas titres of 1:32 and 1:64 indicated recent infection within two months. The ethanol-precipitated antigen is reported to contain at least two different types of erythrocyte sensitizing substances. One was polysaccharide in nature which could be coated onto fresh, unmodified, sheep RBCs while the other could be coated only onto tannic acid-modified red cells which indicated that it was possibly protein in nature. Haemagglutination test carried out with the sensitized, fresh, unmodified red cells reportedly demonstrated genus specific reactivity whilst the test with sensitized tanned cells showed serogroup specific reactions with various antisera [5].In the present study, fresh unmodified sheep erythrocytes were used in the preparation of the antigen. As gluteraldehydre fixed tanned erythrocytes gave aberrant results, they were not used in the study. It is reported that the ethanol precipitated antigen (ESS) contained large amount of carbohydrate (CHO) (17.18%w/w) and much less of protein (4%w/w).It was also pointed out that the CHO moiety was largely responsible for the genus specificity of the test [2].Hence in the present study, the use of genus specific antigen for sensitization of fresh unmodified SRBCs in PHA, helped in effective screening of leptospirosis in man and animals.

The PHA was carried out using ethanol extracted antigen from serovars Pyrogenes and Patoc. In bovine sera, the antibodies active in IHA using ethanol extracted antigen, were reported to be in the IgM fraction [3]. It was opined that the IgG antibodies even if they bind to ESS might agglutinate the sensitized erythrocytes poorly in comparison with IgM, which had more active binding sites [9]. Hence it could be assumed that sera samples that showed high PHA titers in this study were from acute cases of leptospirosis.The optimum dilution of the antigen used in the study was 1:2.The antigen was prepared from leptospires grown in 100ml volumes of EMJH media. This was in agreement with the results obtained by [10], who used a 1:3 dilution of the antigen prepared from two liters of EMJH liquid media and [11], who used a 1:4 dilution of the ESS prepared from litre volumes of Korthoff's media.It was reported that the ethanol extracted ESS could be stored at 20^{o}C for at least three months without any change in its sensitivity [11]. In the present study it was found that ESS could be store for a maximum five days at 4^{o}C following which aberrant test results were obtained. As the sensitized SRBC antigen used in this study was prepared from fresh and unfixed SRBCs, it could only be stored for a maximum period of five days at 4^{o}C.

In the present study, PHA could detect leptospiral antibodies in 14 of the 74 bovine sera tested. It has been reported that PHA titres of bovine anti leptospiral sera are usually low, as IgM antibodies, the major class of antibodies detected by PHA were unlikely to persist in infected cattle [3].The PHA could detect antibodies in 12 dog sera, two cattle sera and six human sera samples which were negative by ELISA. Several authors have identified IgM as a major class of immunoglobulin detected by PHA [3,5].The IgG ELISA could detect only IgG antibodies and hence it could be possible that those sera samples which were negative by ELISA and positive by PHA contained only IgM antibodies and hence were probably collected during the very early stages of infection. In addition to this, the ability of PHA to detect both IgM and IgG antibodies has been reported by [1]. This explains why the relative sensitivity of ELISA to PHA (76.92 per cent) nearly equaled the relative sensitivity of PHA to ELISA (71.42 per cent).Dogs are usually prone to acute infections while cattle are reportedly chronic carriers of infection which explains the high

sensitivity of PHA in dogs followed by human beings and the very low sensitivity of PHA in cattle (25 per cent). The PHA showed maximum specificity in detecting leptospiral antibodies in cattle (92.3 per cent) followed by human beings (89.65 per cent), while it showed less specificity in dogs (74.02 per cent). The large number of PHA positive samples in dog may also indicate non specific agglutination. Hundred per cent sensitivity and 94 per cent specificity for IHA to MAT in human sera has been reported by [12] while [13] revealed a relative sensitivity and specificity of 92 per cent and 95 per cent respectively in human sera.

Though ELISA has been proved to be one of the most sensitive serological tests, this study shows PHA to be equally good in the diagnosis of acute leptospirosis. As PHA does not require any sophisticated equipments and is less cumbersome, less expensive and relatively rapid when compared to other serological tests like MAT and ELISA, it can easily be employed for early diagnosis of acute leptospirosis in canines and human beings.

CONCLUSION

The Passive Haemagglutination Assay is a genus specific test which is relatively rapid, easy to perform, inexpensive and can detect IgM antibodies in blood when compared to IgG ELISA. It proves to be an effective test for rapid diagnosis of acute leptospirosis in canines and human beings. Hence the PHA can be preferred over ELISA for early diagnosis of acute leptospirosis.

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Table1a. Relative sensitivity and specificity of PHA to IgG ELISA in dog, cattle and man

Test	Sensitivity (%)			Specificity (%)		
	Dog	Cattle	Man	Dog	Cattle	Man
ELISA	71.42	25	62.5	75	92.3	89.65

Table1b. Relative sensitivity and specificity of IgG ELISA to PHA in dog, cattle and man

Test	Sensitivity (%)			Specificity (%)		
	Dog	Cattle	Man	Dog	Cattle	Man
ELISA	76.92	85.71	90.9	69.23	40	59.09

Table2. Comparison of results of MAT and ELISA

Tests	No. of samples			
	Dog	Cattle	Human	Total
PHA+ ELISA+	40	12	60	**112**
PHA- ELISA-	36	24	52	**112**
PHA+ ELISA-	12	2	6	**20**
ELISA+ PHA-	16	36	36	**88**
Total samples tested	**104**	**74**	**154**	**332**

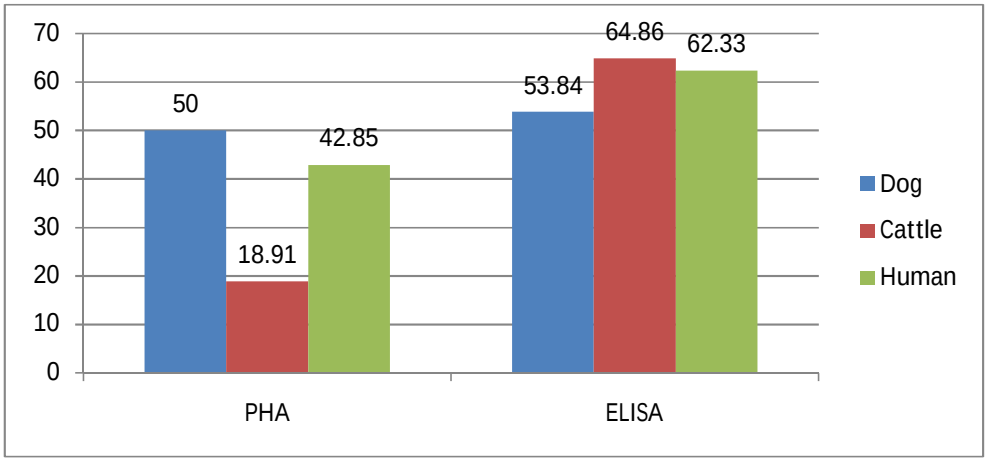

Figure 1.Prevalence of leptospiral antibodies in dog, cattle and man by PHA and ELISA

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RESEARCH ARTICLE

Renascence in Public Arenas and Spaces Emphasizing on Historical Infrastructure of Cities (Case Study-Historical Complex Green Square in Bojnord City-Iran).

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ABSTRACT

The importance of masons, monuments and valuable urban contexts necessitates to be protected. The historical areas of the cities are valuable heritage that plays special role during the time in identification to urban life. Therefore, the role and affects of urban management is very determinate in planning of historic of historic urban area. The main objective of this study is to determine appropriate strategies for the revitalization of the past performance body – applicable – of historical of Green Square complex of Green Square in Bojnord city. The applied research is descriptive – analytic study.To collect data the library and field methods used that some questionnaires appropriate to the purpose of the study were distributed. To determine the required and suitable and suitable sample size the korgan table has been used.The statistical population size is of 575 students that include three categories of respondents that areas 1.Students (undergraduate and graduate) i.e. estimated of 182 questionnaires.2.Tradesmen Green Square in the historical complex that for this population of the 68 members 54 questionnaires have been distributed and completed.Engineers and practitioners associated with municipal organization, heritage , housing and urban development that for population of 18 individuals in this group, 17 questionnaires have been estimated then by using simple random sampling method some of them have been selected and relevant information collected, and questions were completed and data have been analyzed by safe hgostar software (SPSS)…The obtained results shown that the methods of the acquisition technique store store the past functions and activities of green square historical complex include the following important matters:1.Regulatory frame work and restoration of buildings and spaces of complex.2.Construction of

new buildings using complex's architectural pattern. 3.Incentive Policies and Rules for land owners.Also respondents consider the effects of traditional occupations creation to the promotion of the social functions of the green square (with a frequency of 105 people).The respondents consider the effectiveness extent of all following jobs in economical development and improvement of most business men placed in the complex area affective i.e..1.Selling market of souvenirs and handicrafts.2- Setting up cafes and restaurant in complex area.3- Creating craft workshops producing.Then respondents stated the impact of contraction development investments in improving environmental quality and enhance the vitality of historical complex and Finally, respondents consider the impact of cultural attractions creation in sharpness and social interactions on the green square, large with a frequency of 129 persons.

Keywords: Historical context, Green Square, Bojnoord City, restoring the historical context, the restoration of the historic fabric.

INTRODUCTION

Paying less attention to spatial organization of historical context of citieswhen compiling comprehensive and master plans, lack of knowledge about economic and cultural values of historical contexts, selecting cellular preservation and restoration methods, insisting on museum conservation, the tendency to concentrate vital activities of the cities in the new context, changing the structure and space of historical neighborhoods proportional to the area of civil services, migration and social replacement in historical context are all considered as threatening and destructive factors which convert the historical context into the ruins in the center and core of the cities. The way to deal with any problems created in such contexts is not the same (Kalantary Khalil Abad et al., 2006:1). Today the common model of planning for rehabilitation and restoration of historic district of the cities is comprehensive systemic planning which views economic, social, cultural, demographic and structural problems together in a continuous and integrated process and tries to establish a link between them by analyzing characteristics and their interactions and finally presents a comprehensive and integrated plan for planning restoration of the historic districts of the cities. Experiences have shown that one-dimensional and unilateralplansnot only can't fixthe problems but also creates a serious disruption in the system of historic urban life. Sowith attention to different aspects of the subject and comprehensive planning according to economic, social and cultural factors guarantees appropriateness of other programs (Kalantary Khalil Abad et al., 2005:77). The present paper is organized in five chapters. According to scientific research tradition, the first chapter includes research problem, major and minor purposes, research methodology and research scope. The second chapter is devoted to theoretical subjects. Chapter three is the study of human, economic and natural (climate, topography, vegetation, geology…)and general characteristics of the city. Data analysis through filling in the questionnaires by a number of shopkeepers of Green Square, students and experts of urban affairs is performed in chapter four. Finally chapter five explains testing hypotheses, conclusion and provides solutions and suggestions for the subject of the study.

Statement of the Problem

There are still very rare information and studies performed on urban spaces in historic contexts in Iran. However, given this information it can be said that the past urban spaces had often the required efficiency for life in terms of function and structure and their communicational role is often the most important function. Although people are present during the day in big cities for commuting, this presence isn't pleasant due to environmental pollution, noise pollution, air pollution and congestion so that they avoid them. In addition, there are no appropriate urban spaces for most of social activities. However, simultaneously with the rise in urbanization in a society, form and function of different social institutions are changed and interactions and communication in the urban community extend; however, despite quantitative expansion of communication, humans suffer from self alienation, anonymity and individuation due to superficial relationships (Mortazavi, 2011:17). Cities and urban environments can be considered

the best and most valuable technological, artistic and social products of human during the past centuries and urban areas as the most important parts of the cities. The most contact, interaction and communication occur in these areas. Currently, public areas in many countries are under threats and this is the most important problems of recent decades. Today, we are witnessing a decline ofsuchareas and most of these places and historic centers in central parts of cities in different countries have turned out to be dangerous places without security and vitality and required attraction for citizens.

As with similar places in most of cities of the country, central area of Bojnord city played a more or less certain and continuous role based on presentation of administrative and commercial services in urban and rural areas before economic and social developments in recent decades followed by rapid increase in the rate of growth and increasing concentration of population in urban areas and physical development (improvement plan of Bojnord Green Square, 2007:3). Nowadays, due to urbanization development and increase in population growth in Bojnourd and advent of Automobile, considerable physical changes have occurred and many structures have ruined in the city and public spaces at once have lost their major functions and new challenges have been created which necessitates performing scientific researches in order to protect functional-structural values and regeneration of such spaces. These relatively rapid changes in human demands and urban spaces (as a structure for public activities of urban life) led the people to demand establishing dynamic spaces and boosting public spaces which are reflections of vitality of societies.So considering the abovementioned, this question is raised: how the historicalcomplex of Green Squareof Bojnord can achieve its past functional-structural revitalization and with what strategies?

Research hypotheses

It seems that by bringing back some of traditional businesses and jobs which were active in the past the complex can be restored socially and functionally.

RESEARCH METHODOLOGY

The research methodology in this paper is descriptive-analyticand the research type is based on the objective of an applied research. Library and field methods were used for data collection. Field research was performed by the researcher directly by performing interviews and distributing a number of questionnaires among people who were active around the complex as well as some experts of Bojnourd. So a number of questions proportional to the research purposes were distributed after being approved by experts. Then some of them were selected by simple random sampling and related data were gathered and questions were answered. Spreadsheet software SPSS was used to analyze data. SWOT was also used to complete the findings of the research.

Research purposes

Main purpose: the main purpose of the research is determination of appropriate strategies for revitalization (structural-functional) of the past of the historic complex of Green Squarein Bojnord.

Operational and administrative purposes

- Determining the role of spatial organization played by the historic complex Green Square of Bojnord in its physical rehabilitation.
- Determining the role of bringing back some traditional businesses and jobs which were active in the past in social and functional rehabilitation.
- Determining the role of creating attractionsappropriate for the historical-cultural context Green Squareof Bojnord in promotion of dynamicity, environmental quality and social vitality in citizens.
- Identifying and analyzing factors affecting decline and slump of the historic complex Green Square.

- Identifying the problems and bottlenecks and functional potentials of the historic complex Green Square.
- Considering solutions in order to maintain and restore the original identity of the historic context.
- Increase in urban management presence, increase in public spatial and natural security.

The concept of space and Geographical Area

Space means the area or a great area denoted usually by ground surface and it doesn'tmean the outer space or straightforward setting of objects (Ramezani Darabi, 2003:20). Geographical space is a space which is possible for human to achieve it; it is a space used by human for surviving and consists of a set of relations establishing in objective framework on the earth (Khosravi, 2009:24-25). It seems that definitions suggested for public space emphasize on unlimited access to space or various activities; the most notable of them is social interaction occurred due to the unlimited access. Thus, public space can be defined as a space to which people have access and in which activities occur and is a space that controls a public organization and is managed for public interests (Madani Pour, 2005: 215-216).

Steps of spatial development and growth of the cities in Iran

Urban context is a set of different components and elements with various functionsthe spatial order of which creates a special structure for this part of the city and onedimensional encountering makes the change of the structure impossible so organizing it requires socio-economic, physical and structural aspects (As'adi, 1997:1-2). Over different periods, changes have occurred in the contexts of the cities followed and accompanied by new around pervious and old ones. In general, the process of urban development in Iran can be studied in seven steps (Mashhadizade Dehghani, 2008:424).

- Historical context; creation and development of initial core of the city
- Old context, Iranian-Islamic form of the city
- Middle context of the city
- New context of the city; rapid growth of urban development and uncontrolled sprawl
- The surrounding urban context
- Satellite context or discontinuous sprawl
- Metropolitan sprawl accompanied with the creation of new towns.

Organic link of squares with other urban spaces and elements

As with markets have economic, social and cultural functions in addition to communicational function, most of squares also have a space and context for performing some of important social and urban activities in addition to communicational role. In the past, all squares didn't have the same functional (structural) characteristics but some of them such as public squares, some of governmental squares, some of commercial squares and most of local squares as important urban spaces embedded many important activities and spaces. So there were always a kind of proximity and link between important urban spaces and such squares; an adjacency and link that was based on more or less certain patterns. Only in some of big cities there were all kinds of such squares;however, in most of small and medium cities there were only one or several types of them. In addition, structural and functional characteristics of every kind of squares were different in different cities. For example, Naghsh-e Jahan(Imam) Square of Isfahan used to be a public and governmental square and in addition to communicational role played in urban road networks, some of important urban spaces such as new Masjed-e Jame, Ali Ghapoo and the market were built in connection with it. However, Green Squarein Tehran which was a public square or Arg square which was almost governmental square, none of them were similar to Naghsh-e Jahan square in terms of space and function. So the structure and functional and structural context of any city play an important role in the formation of different kinds of squares and how they link and their proximity with other urban spaces (Soltanzade, 1993: 90-92).

There are many ways to create "good scenes" and interesting and vivid environment. The most successful way of using a park or a square is that an activity source should be considered within or next to it such as a cafe or stalls selling foods. In addition, in central parts some spaces can be created for the following purposes:

- Encouraging artistic performances in streets
- Converting squares to a night place for Movie Theater
- Embedding markets, carnivals and parades (Levin Davis Company, 2005:99).

Historical context of Green Square

This complex is known as a prominent element in spatial organization of Bojnord. However, dimensions of the square in terms of area (48×50m^2) are more similar to a local square but in terms of social interactions, range of clients and public recognition is beyond the role and performance of a town square or an active local center. Today, this square has a direct relationship with Shahid Square located in the northern part. The existence of some old buildings such as Sardar caravansary, traditional shops and an old bath around it as well as a branch of the traditional market in this area have caused the square to be prominent. Sardar caravansary has simple architecture and materials used include brick, masonry mortar and plaster. The building is 43m long and 42m wide and there are 26 brick pavilion around its four sides the roofs of which are covered by wooden beams. Opposite the pavilions, a 2.5m wide hall has made the connection of four sides of caravansary with the yard and outside possible. There are also columns with 70cm diameter which keep the hall on hold. One of artistic and historic beauties of the caravansary is semicircular arches and decorations on the bricks (Ansari Mood et al. 2010: 108-110). In general, goods and services provided in historic complex of Green Square are very diverse. After warehouse, the widest area is for selling carpet and rugs with 155m^2. The number of business units in this job is 9 followed by toggery with 107m2 and 10 business units. Selling dishes (7 units), utility store with 3 units, shoe shop, sewing store, spare parts of appliances store, wool and sponge and cotton store (each with 2 units) and other jobs have allocated one unit separately.Table 1 indicates the number and area of business units in the historic complex of green square.

RESULTS

Questionnaire analysis

As mentioned, in this research Kookran table was used to determine the required sample size. Statistical population size includes three groups of respondents:

- Students (bachelor and associate) of architects, urban development, geography, and urban planning who were studying in state, nonprofit, Azad and Payam Noor universities in Bojnordwhen filling in the questionnairesand considering Kookran Formula statistical population size was 575 students and 182 questionnaires were considered for them
- Businesses within the historic complex of Green Square including 56 people worked in 12 business units thus for the population size of 68, 54 questionnaires were distributed and completed.
- Related experts and professionals in municipal organization, cultural heritage and housing and urban development organizations and some of university professors related to the subject. Considering Kookran formula, for the population size of 18, 17 questionnaires were considered for them. Then using simple random sampling,a number of them were selected and information was collected and finally using SPSS software data were analyzed.

SWOT Model

Swot matrix is one of important techniques in urban and regional planning. General study of internal and external (locality, city, region and district) environments account for an important part of strategic planning process (Kalantari et al. 2006:91). Swot model consist of four keywords of strengths, weaknesses, opportunities and threats (Kordi 2002:124).

Testing Hypothesis

Valuable historic buildings and contextsare precious heritages the preservation of which not only give identity to historical values and human civilization but also to national pride and culture and honors which are considered great support for any country. Today the move toward protection and using economic potentials of historic sites especially squares are priority of all urban planners. As shown in table 5 in chapter 4, 145 respondents considered the following ways for restoring past functions and activities of the historic complex of Green Square: 1. Structural organization and restoration of buildings and spaces, 2. Construction of new buildings by using architectural model of the complex, 3. Incentive policies and rules for owners. Respondents considered the effect of traditional jobs on the promotion of past social functions in Green Square as high (with the frequency 105). They considered the effect of increased diversity of economic activities of the historic complex on dynamicityas high. Finally the respondents considered the creation of the following jobs :

- Market selling souvenirs and crafts.
- Café and restaurants in the space of the complex.
- Craft production workshops; as effective on economic development and prosperity of businesses.

CONCLUSION

Using intrinsic and sustainable local techniques and skills based on participation of historic contexts as identity and manifestation of culture, its improvement and reconstruction are emphasized so reconstruction of the historic context of Green Square is focused. Theories and models of reconstruction and improvement in structure and function of the historical context of green square with the least change and interference and strengthening its elements, people with culture approach, museum model with emphasizing on cultural heritage preservation, conservation and decorative method for maintaining and promoting urban scene for giving identity to surrounding space and topical and thematic interventions to revive historic context values in order to create urban identity of Bojnord are suggested. In the present study, Swot technique was used considering necessities and theories raised for improving the historical context of Green Square so that opportunities and strengths increase and threats and weaknesses decrease. Problems of the historical context in structural grounds are lack of appropriate business services in the historical context of green square, economic participation and cultural and tourist services. So considering Swot technique, there are 8 opportunities, 10 strengths, 11 weaknesses and 10 threats indicating the good place of Green Square in giving identity to Bojnord and creating belonging sense among citizens.

Suggestions and Recommendations

- The first and most fundamental suggestion based on the results of the study is that the space studied (Green Square)faces with complex and several problems due to lack of attention which requires coordinated plans.
- Determining values and anti-values, positive and negative factors of historical context
- Determining the role and task of other responsible systemsrelated to improvement and upgrading the historical context and appropriate planning for attracting professional institutes and organizations related to the topic

- Removingredundant activities and functions and determining new land uses appropriate for revitalization of historicalcontexts
- Encouraging and strengthening social and public institutes and planning for attracting people participation especially businesses locatedwithin the complex for reviving and strengthening public culture
- Removing environmental problems including problems of trash, wastewater, air pollution, etc. to create some pleasant, beautiful, diverse space with urban identity and modeling of architectural concepts remained from the past
- Along with structural and environmental reforms, banking and urban development regulations, broad cultural efforts should be performed for removing mental, social and psychological decays of citizens towards the old and historical contexts.
- Lack of public parking in the main streets adjacent to the complex and the cars parked in fringes and sometimes within the complex has made some problems.
- Lack of service spaces especially recreational spaces and lack of adequate lighting at nights in the passages and social security within the complex.
- Establishing a harmonious mix of renovation, restoration, rehabilitation of old design and new materials (i.e. maintaining vital energy exchange of urban life between historical and new contextsat the margin and developing heterogeneous construction around the monument)
- Using traffic signs in the area, determining privacies, separating different spaces and determining the appropriate place for each activity require appropriate measures. Some of the tools which can be used are: fences, chain, trees, proper flooring, waterfronts, colors, gutter, different kinds of paintings and symbolic signs, lights, lighting and etc.
- Increasing social security of Green Square by gathering addicts and constructing and repairing abandoned houses and ruins
- Development of tourism infrastructures and creating tourism-cultural hubs
- Institutionalizing social partnerships between local managers and citizens

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Table 1: Number and area of business units around square

Percent to total	The no. of active units	Percent to total	Area(m^2)	Activity	Row
12.50	7	5.23	135.36	Dish retailer	1
17.86	10	4.15	107.56	Toggery	2
5.35	3	2.15	55.64	Drapery	3
16.07	9	6.01	155.66	Rugs and carpets	4
3.57	2	1.17	30.36	Shoe store	5
1.79	1	0.44	11.43	Handbags	6
1.79	1	2.35	60.97	Appliances	7
3.57	2	1.70	44.04	Sewing store	8
1.79	1	0.43	11.19	Plastics	9
3.57	2	2.21	57.14	Grocery	10
1.79	1	1.90	49.18	Rice store	11
1.79	1	1.73	44.83	Chicken and eggs	12
1.79	1	0.61	15.60	Candy Making	13
1.79	1	2.53	65.85	Drugstore	14
1.79	1	0.44	11.32	Shoemaker	15
1.79	1	0.48	12.49	Electrics	16
3.57	2	2.13	55.05	Spare parts of electrical appliances	17
1.79	1	0.26	6.69	Plumbing	18
5.36	3	1.40	36.21	Utility store	19
3.57	2	0.96	24.95	Wools, sponge	20
1.79	1	0.37	9.67	Supply of products	21
1.79	1	1.73	44.83	Marriage office	22
1.79	1	1.90	49.18	Dentistry	23
1.79	1	57.72	1494.5	Warehouse	24
100	56	100	2589.33	Total	25

Source: field research of the researcher and improvement plan of Green Square of Bojnord, 2012

Table 2. Determining statistical population size

Questionnaire percent	Number of questionnaires completed	Sample size	Population	Parameter	Row
71.94	182	182	575	Students	1
21.34	54	54	68	Shopkeepers	2
6.72	17	17	18	Experts	3
100	253	253	----	----	4

Source: author, 2012

Table 3. Questionnaire table

%70.34 of respondents were male (n=178) and 29.64% were female (n=75).	Frequency distribution of gender
209 or 84.61% of respondents were in age range of 20-30 years old. The least frequency was for age range of more than 50 years old with n=1 (0.44%)	Frequency distribution of age
56.52% (n=143) had diploma and associate degrees and 2.77% (n=7) were lower than the degree of diploma.	Education level
The most frequency (n=182) or 71.93% of respondents were students and the least frequency or 1.98% were experts.	Respondents jobs
According to findings obtained from questionnaires, 79.05% were single with the most frequency (n=200) and the least frequency was for divorced people.	Respondents marital status
The most frequency (n=123) or 48.62% of respondents have been living all of their life in this city. However, the item of ''more than 5 years'' had the least frequency with 22.13%	Duration of residence in the city
145 respondents believe that for achieving the past functions and activities of the historical complex of Green Square, the three following methods should be used: 1. Structural organization and restoring monuments, 2. Construction of new buildings using the complex's architectural model, 3. Using incentive policies for owners. 3.95% of respondents (the least frequency) believed that applying incentive policies for owners can restore the past activities and functions.	Access method to restore thepast functions and activities of the historic complex of green square
41.50% of respondents selected the item High which is the most frequent in terms of number (n=105). 51.4% of respondents believed that the effect of traditional jobs on promoting the past social functions of green square is very low which is the least frequent.	The effects of traditional jobs on promoting the past social functions
56.92% of respondents selected the item High which is the most frequent (n=144). The item Low had the least frequency with 17 or 6.72%. It means that respondents considered the effect of construction investments on the improvement of environmental quality and livability of the historical complex green squareas high followed by Very High item.	The effect of construction investments on the improvement of environmental quality and livability

105 respondents (41.50%) believed that the effect of organizing historical context of green squareon the attraction of tourists and economic prosperity of the city is high. The least frequency was for the item Very Low with 42.	The effect size of organizing historic context on the attraction of tourists and economic prosperity of the city
The respondents considered the effect of increasing diversity in economic activities of the complex on its dynamicity as high with the frequency 137 (54.15%) followed by very high with 63 (24.89%) and low with 44 (17.40%). The least frequency was for the item very low with 9 (3.56%).	The effect size of increasing diversity in economic activities of the complex on its dynamicity
129 respondents (50.99%) believed that the effect of creating cultural attractions on livability and social interactions of green squareis high followed by the item very high with the frequency 110 (43.48%). The least frequency was for the item low with 14 (53.3%).	The impact of creating cultural attractions on livability and social interactions of Green Square
Respondents selected the item very high with the frequency 122 (48.22%) followed by high with 92 (36.37%). The least frequency was for the item low with 39 (15.41%).	The effect of supplying spaces for parking lot and walkways on creation of a good space for leisure times of citizens in the historical complex of green square
86.17% of respondents selected the item "all cases". It means that 218 respondents believed that the following measures are effective: 1. Restoration of buildings in green square, 2. Flooring, construction of walls and outdoor lighting, 3. an appropriate green space. The least frequency or 2.77% of respondents believed that only an appropriate green space can be effective.	The effect size of the following measures on the organization of the historical complex greensquare
Respondents selected the item very high with the frequency 126 (49.82%). The least frequency was for the item very low with 3 or 1.18%.	The effect size of organizing abandoned places of the complex on preventing pesky presence of strays
The most frequent item selected was High with 145 (57.31%) followed by Very High with 68 (26.88%) and the item Low with the frequency 38 (15.02%). The item Very Low had the least frequency with 2 (0.75%).	The effectiveness of reformation and reorganization of the complex on improvement of economic situation of the businesses located in the complex
Respondents selected the item High with the frequency 153 (60.48%). The least frequency was for the item Low with 31.	The effectiveness of historical contexts especially Squares as a model for designing new urban spaces
The most frequent item selected by respondents was Very High with the frequency 171 (67.59%) followed by High with 51 (20.16%), Low with 27 (10.67%) and finally Very Low with 4.	Effectiveness of preserving historical complexes on maintaining urban identity
69.96% of respondents selected all cases. It means that 177 respondents believed that all three following organs: 1. Housing and Urban Development 2. Cultural Heritage 3. Municipality; should play a key role in organization of the historical green squarecomplex. The least frequency or 3.95% of respondents believed that only Housing and Urban Development organizationshould play the role.	What governmental agencies can have the greatest effect on the organization of the historical complex
67.19% of respondents selected all cases. It means that 170 of	What jobs are more effective in economic

respondents considered all three following jobs: 1. Market selling souvenirs and crafts 2. Traditional café and restaurants 3. Workshops producing crafts; as effective in economic prosperity of businesses located within the historical complex green square. The least frequency, 3.95% of respondents, selected the item Workshops producing crafts.	prosperity of most of businesses?
The most frequent was for the item High with 124 followed by Very High with 97 then Low with 26 and finally Very Low with 4.	Effectiveness of special and local projects on acceleration of implementing organizing measures
174 respondents or 67.77% selected Cultural Heritage. 5.94% of respondents selected other items with the least frequent.	Which executive system should prepare an organization plan?
48.73% of respondents selected the item all cases indicating 123 respondents considered the following as efforts that should be done by Owners and businesses: 1. Consultation and participation at the time of preparing the plan 2. Consultation and participation when implementing the plan 3. Consultation and participation after restoration and organization of the complex. The least frequency was for the item Consultation and participation when implementing the plan with 7.90% or 20 respondents.	Owners and shopkeepers participation in organizing measures
The most frequent was for the item Very High with 109 followed by the item High with 129 and Low with 15 and finally the item Very Low.	Effectiveness of notification of organizing measures on engaging of owners and shopkeepers
68.57% selected the item all cases indicating 171 respondents considered the following incentive policies effective: 1. Tax exemptions 2. Granting financial facilities (loans) 3. Exemptions from municipal duties. The least frequency, 2.77% of respondents, selected the item Exemptions from municipal duties with n=7.	Effectiveness of incentive policies on renewal of historic contexts especially green square

Table 4.SWOT Analysis

Threats	Opportunities	Weaknesses	Strengths	
1. increased vehicle traffic in the inclusive area of the plan 2. lack of relevance and coordination of land uses and services in the vicinity of the complex 3. high risk investments in the complex 4. high volume traffic in the adjacent area of the	1.Having the potential to attract tourists 2. lack of knowledge of owners and shopkeepers of historic context of the complex 3. being located valuable historical elements including museum near the complex 4. convenient access to other urban parts 5. interest and participation of executive systems to organize the complex 6. belonging sense of citizens to the complex 7. ability to create conditions for	1.lack of recreational, cultural and health facilities 2. lack of awareness and knowledge of owners and shopkeepers of the historic context of the complex 3. absence of tourists 4. lack of social-cultural attractions 5. distortion of urban landscape 6. utilities burnout 7. high traffic volume 8. congestion and noise pollution 9. instability of historic	1.historical identity 2. valuable historical elements 3. participation of shopkeepers and owners with authorities 4. proximity to the centers with religious importance 5. belonging sense of residents to the site	**Historical context of green square**

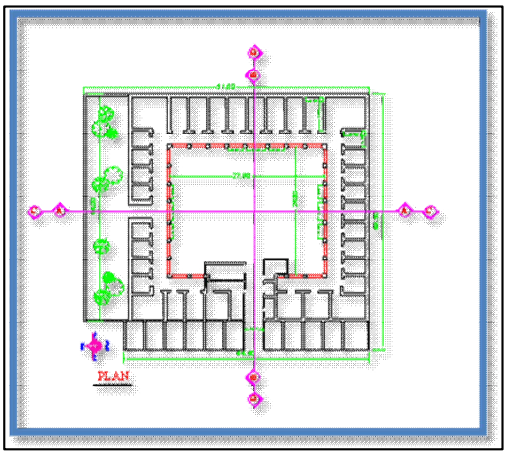
complex 5. lack of required parking lot at the entrance of the complex 6. lack of adequate knowledge of authorities, executives of the potentials in the complex 7. intention of profit seekers to destroy and construct high-rise buildings inconsistent with the architecture of the complex 8. lack of special urban plans from responsible agencies for the complex	the investor	buildings 10. high price of land	6. being in the economic hub of the city 7. appropriate form and model of urban development	

Table 5. Effect size of restoring traditional jobs and activities of the historic context of Green Squareon restoration of social functions.

Percent	Frequency	Parameter		Question	Row
57.31	145	All cases (1. Structural organization and restoration of buildings and spaces, 2. Construction of new buildings by using architectural model of the complex, 3. Incentive policies and rules for owners).	The most frequency	ways for restoring past functions and activities of the historical complex of Green Square	1
		Construction of new buildings by using architectural model of the complex	The least frequency		
41.50	105	High	The most frequency	The effect of creating traditional jobs on the promotion of the past social functions	2
5.14	13	Very Low	The least frequency		
54.15	137	High	The most frequency	the effect of increased diversity of economic activities of the complex on its dynamicity	3
3.56	9	Very Low	The least frequency		
67.19	170	All cases (1. Market selling souvenirs and crafts 2. Café and restaurants in the space of the complex 3. Craft production	The most frequency	Which jobs are the most effective on economic development	4

		workshops)		and prosperity of businesses within the complex	
3.95	10	Craft production workshops	The least frequency		

Source: author according to data of questionnaire



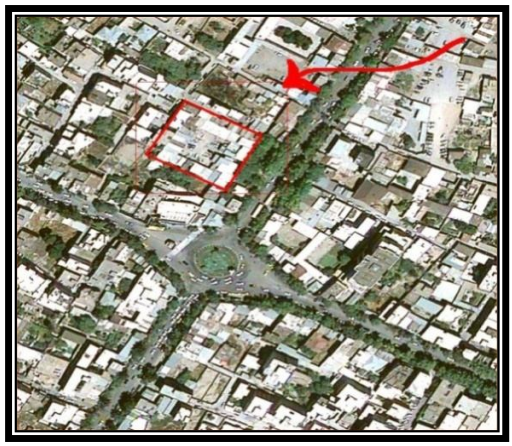


Figure 1 and 2: A view of the historic complex of green square.
Source: Northern Khorasan Cultural Heritage Organization, 2012

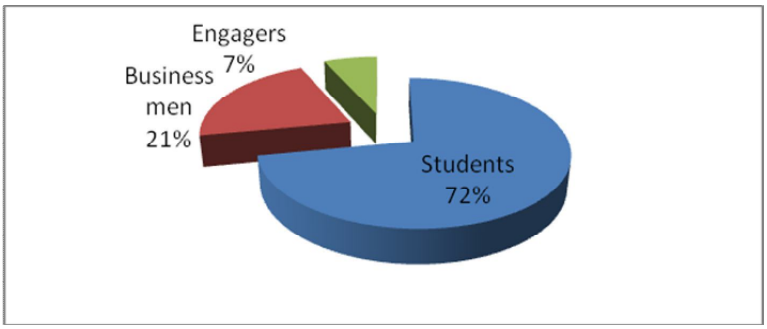


Figure 3. The percentage of questionnaires completed groups.
Source: based on statistics in table 2 by author

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RESEARCH ARTICLE

A Study on Relationship between Organizational Culture and Human Resources Productivity in Employees' perception of Quchan Bicycle Manufacturing Industrial Complex's based on Qubnn and Garrett Model.

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ABSTRACT

The present study has been done with purpose of review relationship between organizational culture and human resources productivity in employees' perception of Quchan Bicycle Manufacturing Industrial Complex's This research is of descriptive and analytical kind and the research area Quchan Bicycle Manufacturing Industrial Complex and the research population research is working employees in aforesaid industrial complex, and the sample size is 76 individuals that has been selected in randomly method. A questionnaire has been used to collect data that includes personal information and study of the relationship between organizational culture with the productivity of the employees i.e. consist of 40 question which are in two parts of organizational culture and productivity scales and finally in this test was proved that there is significant relation between culture organizational culture and the productivity of the employees , the correlation is of positive kind and participating culture is a appropriate hospitalized to increase the productivity of the employees.

Keywords: Productivity, Human Resource, Managers, Culture, Employee, Empowerment, Organization, organizational Culture.

INTRODUCTION

The issue of organizational culture has been pervasive in the modern management discussion. In the early 1980 organizational culture was placed in the focus of attention to study the organizational behavior and hundreds of

researcher in this regard began to study and claimed that the organizational culture can leads to difference between successful and unsuccessful organizations. Most of the studies related to the organizational culture were done in early 1980 that change the perception manner of researchers and managers towards organization. The organizational culture and its management in the new attitude to organization has special place. The culture is defined as soul of organization and social energy that can forward organization or intercepts it and potentially is due to the impact which culture has on the behavior of employees. (Abtai Hosin &Kazemi Babak., 1996)The organizational culture is a new vision for the evaluation of the organizations, it is called social force that forms the reagent in the perception of organization's members of the organization towards concepts and the reality, it controls the organizational behavioral pattern of organizational and causes for belonging or un-belonging of employees to organization.

In the more comprehensive definition can be said that culture is the set of assumptions or models, values and shared norms among the members of the organization that aspects through formalities, organizational customs and traditions, stories and symbols, the language of the hero and organizational manifestations. Many researchers have shown the impact of organizational culture on the behavior and as result employees' performance and efficiency and conclude that one of the main factors of the failure of the improving productivity's movement and also the low productivity extent of manpower at the level of organizations are disregarding the organizational culture. The Culture of any organization is the base of its various activities. Organizational culture can be mobility and dynamic factor with its positive aspects or have deterrent role with its negative aspect.Today, one of the fundamental problems in our organizations is low productivity level of human force, i.e. Our most precious and valuable assets means same human force are not enjoying of productivity. Since the organizational culture could have a significant impact on employees' behavior in the organization and also because the organizational culture include a complex part of values and ideas of the employees and these values affects on attitudes manner and finally behavior of the people in the working environment and this productivity related to human force, therefore in the above research the relationship of organizational culture with employees' productivity will be studied and we introduce the cultural which leads to high productivity .(Alvani Seyed Mehdi, 2000).

The manpower factor is one of the biggest and most important and influential factors and determinant in the success or failure of the organizations. The organizational culture due to the impact on employees' perception and behavior will be influences their productivity. So in this study at first the relationship between organizational culture and employees' productivity will be studied. Secondly, since today, one of the fundamental problems in organizations is low productivity of employees and one of the reasons of the improving productivity movements' failure is disregarding towards organizational culture, so in this study, the impact of culture on the productivity of the employees will be considered.

Organizational culture

Organizational culture is the behavior of humans within an organization and the meaning that people attach to those behaviors. Culture includes the organization's vision, values, norms, systems, symbols, language, assumptions, beliefs, and habits. It is also the pattern of such collective behaviors and assumptions that are taught to new organizational members as a way of perceiving, and even thinking and feeling. Organizational culture affects the way people and groups interact with each other, with clients, and with stakeholders.

Ravasi and Schultz (2006) stated that organizational culture is a set of shared mental assumptions that guide interpretation and action in organizations by defining appropriate behavior for various situations. Although a company may have its "own unique culture", in larger organizations there are sometimes conflicting cultures that co-exist owing to the characteristics of different management teams. Organizational culture may affect employees' identification with an organization. (Bazaz Jazaieri, Ahamad, 1994)

Schein (1992), Deal and Kennedy (2000) and Kotter (1992) advanced the idea that organizations often have very differing cultures as well as subcultures.

According to Needle (2004), organizational culture represents the collective values, beliefs and principles of organizational members and is a product of such factors as history, product, market, technology, and strategy, type of employees, management style, and national culture. Corporate culture on the other hand refers to those cultures deliberately created by management to achieve specific strategic ends.

Role of Manager on Employees Productivity

The managerial team performs duties including liaison between the executives and employees as well as being administrators of company policies. Business owners need to understand the role that managers play in employee productivity to be certain that managers are utilized properly. Overextending the responsibilities of managers can decrease their effectiveness, while underutilizing them can lead to an inefficient workplace. **(**Mir Sepasi Naser**,** Mir Sepasi Naser**).**

Creating Value

Company managers create value for employees in two ways. The first is in reminding employees of their value to the company. Working with employees to develop efficient job duties and providing staff members with the proper tools to do their job indicates that the employees hold value for the company. A manager can also create value for an employee by showing the impact that the employee's work has on customers. Managers can share customer compliments with staff members to indicate satisfaction from employee efforts.

Providing Tools and Resources

When an employee has the tools and resources necessary to do her job, he can be more productive. Managers insure that staff members have the necessary equipment to do their jobs and that the equipment is in working order.Employees and managers work together to develop a maintenance schedule to maintain the life and productivity of company equipment. Managers also arrange for training that maintains or updates the employee skill set needed to perform all of the assigned job tasks.

Motivating

An employee gets motivation from a manager's attitude and approach. A manager can display a positive attitude by being available for employees at all times, having a professional demeanor and bringing a high level of energy to the workplace. A positive work environment can provide motivation for employees to remain productive, to offer suggestions to improve efficiency and to work together with co-workers to solve daily work issues. It also builds a strong sense of teamwork that can improve employee retention.

Obtaining Feedback

Managers do well to encourage employee feedback on any issue and let employees know that their opinions are taken seriously. Managers act as the liaison between the executive staff and the employees. When employees want their opinions to be heard, they tell their opinions to the managerial staff. This creates a dynamic workplace where employees feel that their opinions have value to the company. Let employees know when one of their suggestions is being acted on and reward employees for ideas that save the company money. This will inspire employees to discover ways that are more efficient to do their job and create employee loyalty.

Types

The dominant culture in organizations depends on the environment in which the company operates the organization's objectives, the belief system of the employees and the company's management style. Therefore, there are many organizational cultures. For example, highly bureaucratic and well-structured organizations typically follow a culture with extensive controls. Employees follow standard procedures with a strict adherence to hierarchy and well-defined individual roles and responsibilities. Those in competitive environments, such as sales, may forgo strict hierarchies and follow a competitive culture where the focus is on maintaining strong relationships with external parties. In this instance, the strategy is to attain competitive advantages over the competition. The collaborative culture is yet another organizational way of life. This culture presents a decentralized workforce with integrated units working together to find solutions to problems.

Advantages

Strong corporate cultures indicate that employees are like-minded and hold similar beliefs and ethical values. When these beliefs and ethical values align with business objectives, they can prove to be effective in building teams because rapport and trust quickly ensues. The bonds that the teams build help them avoid conflicts and focus on task completion. Strong corporate cultures ease communication of roles and responsibilities to all individuals. Employees know what is expected of them, how management assesses their performance and what forms of rewards are available.

Effect on productivity

Organizational cultures can have varying impacts on employee productivity and motivation levels. Oftentimes, employees work harder to achieve organizational goals if they consider themselves to be part of the corporate culture. Different cultures operating in one company can also impact employee productivity. For example, if the organization maintains a reserved "talk when necessary" culture, employees may work accordingly; however, if the organization allows one area, say the sales team, to be outspoken and socially active, the organization may experience rivalries among areas. Thus, allowing an area to set up their own culture can affect the productivity of the employees deployed elsewhere in the company.

Integration of productivity and Culture

Organizations must structure their recruitment processes to attract and engage incumbents with the same beliefs and values that constitute the organization's culture. This ensures the new employee's assimilation to the company and further strengthens corporate culture. Companies should also ensure that they align corporate culture with productivity management systems. When culture and management systems are not aligned, management must redirect them so that employee behavior results in the achievement of organizational goals.

Statement of Problem

The organizational culture specifies the method of doing affairs for employees in the organization. Culture is the equal perceptual in the organization that their presence can be observed in all the members of organization and is representing common and stable characteristics that distinguish an organization from others. In others words, organizational culture defines social identity of each organization. The organization culture is set of beliefs, faiths and common values that affects on behavior and thoughts of an organization's members. Because of reason the foundation and infrastructure of organizational culture is beliefs and values, and these are the factors that can enhance and promote organization and institutes philosophy fundamental to achieve efficiency and effectiveness. Today, the importance of efficiency with regard to the level of competition, technology complexity, lack of resources,

variety of tastes and the speed exchange of information is no secret to anybody. Also productivity and efficiency have the most precious place to managers and all are after greater efficiency and effectiveness and their effort in this regard was formed in order to assure stability of the organization in full competition in the today's world.Since the organization culture can have a significant impact on employees' behavior in the organization and also because the organization culture includes a complex part of values and ideas of the employees and these values impact on manner of perception and finally behavior of the employees in the working environment and this productivity will be related to human force, therefore in the above review we will study the relationship between organizational culture and productivity of the workforce and we introduce the cultural leads to high productivity.

Importance and Necessity of the Research

The issue of culture is of very important maters that has aspect in the soul and body of administrative organizations. Culture is a complex issue that most of mangement's theorists manage to discuss about it and in spite of more than 160 definition of it still there is no scientific consensus in a unit definition for culture so great theorists like hofstede instead of the debate over the defenitions have a lot of attention towards cultural characteristics and dimensions and many of them also tried to Categorizeall kinds of culture inside and as well as outside of the organization.Therefore in this research at first the relationshiop between organizational culture and the productivity of the employees will be studied. Secondly, since today, one of the fundanmental problems in organizations is employees 'low productivity and one of the causes of the improving productivity movement's failure is disregarding to the organizational culture, so in the study, the impact and relation of organ;izational culture on the productivity of the workforece will be considered.

Research Hypothesizes
Main Hypothesis

There is a direct and significant relationship between organizational culture and human resources productivity in Employees' perception of Quchan bicycle manufacturing Industrical complex's based on Qubnn and Garrett Model.
Subordinate Hypothesis

1. There is direct and significant relation between organizational ob ject and productivity of Quchan bicycle manufacturing Industrial complex'Employees.
2. There is direct and significant relation between performance criterion and productivity of Quchan bicycle manufacturing Industrial complex'Employees.
3. There is direct and significant relation beteeen authority level and productivity of Quchan bicycle manufacturing Industrial complex'Exployeees.
4. There is direct and significant relation between power source and productivity of Quchan bicycle Manufacturing Industril complex' Employeees.
5. There is direct and significant relation between decision making method and productivity of Quchan bicycle manufacturing Industrial complex'Employees.
6. There is direct and significant relation between following manner&accepet and productivity of Quchan bicycle manufacturing Industrial complex'Employees.
7. There is direct and significant relation between evaluation criterion of members and productivity of Quchan bicycle manufacturing Industrial complex'Employees.
8. There is direct and significant relation between motivation and productivity of Quchan bicycle manufacturing Industrial complex'Employees.
9. There is direct and significant relation between leadership style and productivity of Quchan bicycle manufacturing Industrial complex'Employees.

Variables Research Introduction

A-Independent variable:In this study, organizational culture is as independent variable. For operating them include: Organization objective, Performance Criterion, Authority Level, Power Source, Decision Making method, Following & Accept Manner, Members Evaluation Criterion, Motivation, Leadership Style

B.Dependent Variable: The dependent variable in the above study is the productivity of the human force. Due to be unlimited human capacities the numerous factors have effect on the productivity of the workforce.

Validity and Reliability of Questionnaire.

To determine the validity of the content method has been used, that after study of the obtained views the ambiguity of the questionnaire have been removed and words that were fluency to sentences, was added.In the present study the validity of information collecting tool was examined and cornbakh a of the questionnaire was calculated validity of means of collecting information, in present research the questionnaire was calculated that result can be seen in the table.With regard to suitable values of cornbakh α the internal credit tool is confirmed.

Statistical population

For instance of to determine the desired sample the following formula will be used in which the level of confidence of 95% and estimation error of 0.05 have been considered.

$$n = \frac{NZ_{\frac{\alpha}{2}}^{2} P(1-P)}{\mathrm{E}^{2}(N-1) + Z_{\frac{\alpha}{2}}^{2} p(1-p)}$$

Where: N =167, $Z_{\frac{\alpha}{2}}$ = 1.96 , E =0.05, P =, ½ , 1-P=1/2

So, according to the above-mentioned formula the sample number hs been chosen 76 individuals whom the questionnaire has been distributed among them and collected and the sampling method in this research was simple random sampling.

Analysis of data

Table of pierson correlation coefficients and significant level between the scale of organizational culture and productivity.In all ases that significant level is the number of smaller than 0.05 there is a significant correlation between the two variables.

CONCLUSION

In this section, we can conclude that researchers who have been tried to state the characteristics of the successful organizations emphasized repeatedly on the concept of culture and power and pervasion of spiritual values, beliefs and assuptionsl that the working force dependent to them. The university's researcher also knows the Japanese's key of success in the organizational culture. So they believe that the strong organizational culture is able to affects on employees' commitment in a significant amount and increase their behavior stability and be replaced the official rules and regulations, andeven act more effective than the official control system. If the culture is strong and positive shall makes people feel better about what they do and causing better performance and more productivity. The increase in productivity leads to improving living standards and better quality of life and increasing prosperity and at the same time, a better life has intellectual growth and mindsets and human work.

Productivity cannot be codified in legislation and written regulations, But should consider the culture, social conditions, attitudes, perceptions and as a system of values effective in the formation of them.As it was said the organizational culture specifies the method of carrying out of affairs for employees in the organization and is representing a common and stable characteristic that distinguisheds the organization from others. In other words organizational culture defines the social identity of any organization, Regarding the impact of organizational culture on the most important and most valuable factor i.e. employees every movement in the field of increasing its productivity should be based on the real understanding of organizational culture in order to leads to success of the groups, because every organizational has a special culture.

Hence we have considered at Firest a reviews in the field of organizational culture and the productivity of the human resources, and we found out that employees productivity is high in participating culture, the and it is much lower in the hierarchical culture, then we studied the relation between organizational culture and employees productivity through correlation test. In this test it has been proved that there is significant correlation of positive kind between organizational culture and the productivity of the work force and main hypotheses of above research is confirmed and can be concluded that there is direct and significant relation between the organizational culture and the productivity of the workforce and participating organizational culture is suitable field to increase the productivity of the employees and hierarchical organizational culture does not enjoy of required conditions and specifications for the productivity of the workforece.The researcher has studied the organizational culture and its impact on human resource productivity by using H in thesis research. The obtained results shows that there is significant relation between two variables and employees' productivity in participating culture is much higher than hierarchial culture. The obtained results also show that participating culture has more effect on employees' productivity.According to conducted study and review in direction to research hypothesis and obtained findings relulted from their testing in order to achieve the organizational culture and increase the productivity of the work force, the following recommendations and suggestions are provided.

Suggestions and Recommendations

It is a participatory process that aims at encouraging and abet employees and members of the organizational as much as possible to give more commitment and participation in organization 'success.The approach is that the employees participate in the decisions that affect their fate, enjoy of the freedom of action in their works.Attention to the emotional and human relationships, behavior manner by some managers causes to create friendship and sustainable trust field between director and his supervision staff. If the relation between manager and his people under its supervision be close and sincerely, employees 'productivity increases.Creativity and Innovation in employees of the organization is of degree to which employees are encouraged to provide new ideas in the organization and management of the organization welcomes their ideas.One of the primary tasks of the managers is to create motivation or incentive in employees, so that their performance reaches at the highest possible level. Motivation is a force that allows people to behave in particular manner. To motive employees in organization it is recommended to act as follows:

- Trust to the employees.
- High level Yield and productivity Expectation.
- Respect to Employees.
- Employee participation in the Organization.

Reward, is one of the most important factors that affects the employees'behaviur. Any payment of reward and promotion (such as the salary and promotion) should be methodical and based on certain criteria and consistent with the performance of the employees to facilities motivation reinforcement and boosts more productivity of most of them. Otherwise will left the devastating effects on the morale of the people and allows a low and bullying morale and subservience be ruled on the work environment?Human force training is the most effective an important means to improve, empower the employees and compliance them with the changing conditions of time and place. Because with quick and sharp changes that will be occur in working methods , tools and equipment, employees training will be necessary .Tanning has improve the duty of the employees in its following, in addition it causes to reducing waste and events, it provides the possibility of making full use of real resources and cost reduction i.e. The main evidence of productivity.

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Table 1.Organizational Cultural Patterns Used in this Study

Hierarchical Culture	Participating Culture	different organizational cultures Organizational variables
laws and orders Implementation	Group survival	Organization Objective
Control and Stability	Group Integrity& Unison	Performance Criteria
Regulations and Directives	Membership in the group	Authority Level
Technical Knowledge	unofficial sources	Source of power.
Hierarchical	Participation	Decision Making manner
Conservative	Friendly support	Leadership Style
Supervision and Control	commitment to the group	Following& Accept Manner
Official classes	Quality Relation	Members Evaluation Criterion
Security	Confidence& solidarity	Motivation

Table 2.Calculated the questionnaire

Coronbakh coefficient	Variable Name	Row
0.789	Organizational Culture	1
0.866	Productivity	2

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REVIEW ARTICLE

Analysis of Environmental Cost-Benefit Considering Environmental Accounting.

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ABSTRACT

Nowadays, considering some environmental limitations especially in global trade and increasing competition tightening, some for-profit companies have to bear environmental costs incurred in order to overcome the constraints and obtain more revenue or commercial popularity in one hand and on the other hand they inevitably have to reduce the respective costs for positive evaluation of the particular performance of environmental conservation.Environmental accounting provides information by which contributes to managers in performance evaluation, control, decision-making and reporting. It relies on economic and environmental concepts and using it requires changes in the culture because it utilizes values that are not resulted from market.

Keywords: Environmental accounting, environmental costs, environmental effects, decision-making.

INTRODUCTION

Nowadays, considering some environmental limitations especially in global trade and increasing competition tightening, some for-profit companies have to bear environmental costs incurred in order to overcome the constraints and obtain more revenue or commercial popularity in one hand and on the other hand they inevitably have to reduce the respective costs for positive evaluation of the particular performance of environmental conservation. To manage

environmental costs, it is necessary to identify them. Environmental costing is an activity being able to increase corporate value. ISO 14000 International Standard is a managerial control system defining environmental performance of a company such that the standard requirements are met. Overall its purpose is that a company can perform its processes, communications and activities without any damages to the environment.Due to increasing growth of population and limited natural resources, environmental protection is considered as a main issue raised in human society. It is important that environmental protection isn't limited to political and geographical borders and requires collective efforts of all inhabitants of the earth. Legal and economical requirements of the global market have led industries to use environmental management systems and employ the related standards (including ISO-14000, environmental performance evaluation standard). Following the introduction of such topics as sustainable development and global village, international environmental standards became more important and it is predicted that in the near future it will be considered more seriously in Iran too. Environmental crises have global outcomes and prevention of its spread requires efforts and commitments of all nations and countries.

Environmental accounting seeks to elucidate hidden aspects of accounting including environmental costs contributing the understanding of their causes, dimensions and creators. Environmental accounting facilitates management and reduction of environmental costs through establishing a relationship between costs and their creators' activities. Today, environmental accounting is developing rapidly especially in large multinational companies such as IBM corporations, Xerox and AT&T who found that a suitable environment is essential for long term competitive success and environmental accounting is considered a vital tool.

Historical background

The interest to environmental accounting in the form of social responsibility accounting dates back to 1970-1980.
In the mid-1970's, production companies encountered with the concept of environmental liabilities reporting. The companies first were reluctant to disclose environmental damages in their financial statement but over time, as the amount of damages to the society increased, the companies forced to accept the fact.In 1975, Financial Accounting Standards Board (FASB) issued Statement No.5 "Accounting for Contingencies". The statement emphasizes that, if loss contingency is reasonably related to the environment and the amount of loss is estimable, it should be reported in the financial statements. Liabilities relating to rectifying for damages to the environment are recognized in the statement as probable losses. However, due to employing different procedures for estimating loss in different industries so that companies didn't follow a single method, there was felt a need to formulate and develop a new guideline. In 1997, Financial Accounting Standards Board issued Interpretation No.14, "estimating the amount of loss" but there was no comment about delaying the record of environmental costs. Damages of wastes to resources increased the society demand for establishing a law but this couldn't propose a solution and solve the problem. Hence the second Federal Law titled as Comprehensive Environmental Responsibility Compensation and Liability Act was enacted in 1980 (Super Fund). This is one of the most prominent and important laws enacted in the field of environment. According to the law, 1.6 billion dollars trust funds were allocated for costs of cleaning the locations (its prominent examples are Niagara Fall and Love Canal) damaged the environment.

In 1990, Financial Accounting Standards Board (FASB) published issue No. 90-8 titled as "capitalization of costs to treat environmental contamination". The board concluded that environmental liabilities expenses should be determined based on a specific plan to the contamination be reduced. According to issue N0.90-8, if environmental expenses meet the following criteria, it is considered as capital costs:

1. Undertaking expenses leads to increased useful life of properties, increased production capacity or improved efficiency of properties compared with initial standards evaluated (recognition criterion is the comparison of asset after environmental expenses undertaken with that of acquisition time).
2. Undertaking expenses for preventing or reducing environmental contamination related to the entity's future actions. A recognition criterion is comparison of asset after imposing environmental expenses with that of acquisition time.

3. Undertaking environmental expenses for the preparation of properties for sale.

In general, if environmental expenses undertaken are for construction or acquisition of assets, it is considered as capital cost provided that it improves safety of the asset, increases its efficiency or reduces and prevents damages arising from operation. If environmental expenses are for maintaining properties (assets) in the standard level of primary performance evaluated, it is considered as cost at the time of occurrence.

Environmental Accounting Purposes

1. Determining environmental opportunities and limiting additional costs not providing added value.
2. Estimating environmental costs of manufacturing entities and taking into account in overhead account.
3. Implementing and maintaining an environmental information system to enhance operations management.
4. Determining future costs and revenues arising from the implementation of environmental management information system.
5. Increasing the amount of information related to environmental protection and making them available for the people need to use for decision making.
6. Controlling environmental pollutants costs along with production costs.
7. Reporting the results of profitability as well as environmental performance.
8. Calculating total cost of collecting environmental costs and preventing damages of using chemicals.
9. calculating real cost and integrating it in planning, and optimizing decision making.
10. Identifying environmental opportunities for creating net profit.

In general, the main purpose of environmental accounting is to provide information on the environment-related works performed by the entity for internal and external users. This information is useful for the users in order to make decisions and evaluate continuation of entities' actions as well as the relationship between users and the entity.

Environmental Accounting

Environmental accounting is a subset of accounting collecting environmental cost data and employing them for the calculation of goods and services costs.Environmental accounting has different implications including national income accounting, financial accounting and management accounting. While national income accounting approaches the natural resources and uses from a national economy viewpoint, financial accounting approaches it from users of financial reports viewpoint for decision making and public responsibilities and finally management accounting approaches it as an information system aiming at supporting management decisions. Due to the importance of the issue of environment both as an internal or external organizational requirement, environmental accounting is linked to the intention for costing environmental activities and the issue of cost is important because of its reality and impact on economic performance of for-profit entity.

Environmental Accounting Implications

Factors such as market, customer maintenance and long term industrial growth are considered by producers when making decisions for determining type, amount and the price of their products. The most important factor associated with products is correct costing. In most cases, different products are produced in different production processes and each production process has its own environmental cost indicating the importance of using environmental accounting in costing. Environmental accounting is also used for investment analyses. This way of assessment is used by investment especially environmental investors for more accurate assessment of potential profitability of investments performed. As entities organize themselves to strengthen their systems structures, environment accounting is an integral part of their success. Such systems coordinate environmental accounting-based data to provide information for managers in order to better understand the effects of their decisions and are used strategically to stimulate improved environmental performance.

Determination of Environmental Costs and Benefits

In financial accounting theory, tangible and intangible fixed assets are identified and recorded at the lowest cost and current value; however, the use of natural resources as well as reduced revenue resulted from reduced natural capital aren't evaluated in the theory. Furthermore, so far many natural resources such as climate have been considered as free goods without being reflected in financial statements.In the operation of financial accounting, production, distribution of products and delivering services require using direct materials cost, direct labor cost, manufacturing overhead cost, administrative and selling costs as well as research and development cost. Although environmental costs account for part of manufacturing and administrative costs, it isn't recorded in special accounts and is considered as public costs.In environmental accounting, it is tried to reflect environmental revenues (revenues of waste disposal, recycling of goods produced) and environmental costs (costs of offsetting damages of harmful radiation incurred to environment) in cost-benefit statements.

One of the most important functions of environmental accounting is attracting attentions to the recognition of environmental costs and allocation of natural resources because lack of attention to it is neglecting the environment for meeting essential needs of human. If harmful effects on environment continue, life chain can't be tolerable.
Advantages of attention to environmental costs are:

1. Better management of environmental costs can reduce air pollution and enhance public health.
2. Identifying environmental opportunities for creating net profit and limiting additional costs without added value.
3. Understanding environmental costs accurately can be useful in decision making on the sharing of real costs and pricing manufacturing products.
4. Designing environmental production process for goods and services
5. Creating competitive advantages among customers so that they prefer using environmentally friendly goods and services
6. Most of environmental costs can be reduced or removed by managing and investing in environmentally compatible technology (such as hybrid cars)

Recognition criteria of costs and losses associated with environment

If expected future costs are related to the past events and transactions existing independently of an entity's future actions, such as costs of cleaning up the abandoned places, liabilities are recognized, provided that outflow of economic benefits for settling probable obligation and estimation of the amount of obligation is reliable (it will be discussed in the next pages). If expected future cost contingency related to future events and transactions is resulted from obligation (such as the obligation for payment of costs for upgrading machinery to prevent environmental damages or installing a filter to prevent environmental pollution), since the obligation is not as a result of past events, the liability isn't recognized (except in particular circumstances) until the occurrence of future events due to uncertainty of obligation and impossibility of economic benefits outflow to settle obligation. However, it should be specified that what contingency degree of a future event is. Probability of a future event is dependent on its importance. Events with high contingency and big amounts are recognized as liabilities if recognition criteria are met. If present obligation and economic benefits outflow are remote, information disclosure isn't required.

If the present obligation contingency is between possible and remote, disclosure of its general conditions through attached notes of financial statements is required. For future operating losses, saving (liability) should not be considered because it doesn't satisfy the definition of liability and recognition criteria. Financial Accounting Standards Board has examined the nature of these events by expecting a standard titled as "recording and reporting for contingencies" and about probable non operating losses(expected future non operating loss) determined a range for specifying probable losses.

1. **Probable:** the future loss is likely to occur and its amount range can be estimated reasonably. Probable loss amount is identified by observing precaution.
2. **Possible:** determination of estimated range of loss in the balance sheet date isn't high; it means that loss contingency is possible so that its disclosure in the appendix of financial statements is required.
3. **Remote:** determination of estimation range of expected non operating loss isn't possible and even if it is slight there is no need to disclose the estimation of future environmental expenses.

In general, if the contingency of the amount of probable losses before issuing financial statements is probable and the amount range of expected losses can be estimated with high likelihood, estimated loss can be identified if recognition criteria are satisfied.

Classification of Environmental Costs

How environmental costs of entities are classified and recognized depends on the field its related information is used and what is its application. In addition, it should be clearly realized that what environmental costs are because their roles played in decision making on whether they should be classified as a part of manufacturing costs or period costs are effective. According to their functions in accounting system, common classification of costs is:

A. Manufacturing costs (direct materials and direct labor, indirect costs or manufacturing overhead)
B. Period costs; the costs in occurrence period reflected in cost-benefit statement. Such costs include:

- Distribution and selling costs
- General and administrative expenses
- Research and development costs

Identifying environmental costs and its relation with production process or corporate assets is effective for optimal decision making by management. Achieving such goals as reduction of environmental expenditure, increased income and improved evaluation criteria of environmental performance for determining corporate value requires special interest of management to current and future environmental costs.

Classification of costs according to management duties or functions:
1. Manufacturing costs (product)
- Direct manufacturing costs (direct materials and direct labor)
- Indirect manufacturing costs or manufacturing overhead (including indirect materials, indirect labor, depreciation of properties and plant machineries, insurance of plant machineries, utilities costs and other costs related to supporting services of the plant)
2. Period costs: costs reflected in cost-benefit statement in the occurrence period (general, administrative, distribution, selling and marketing and sometimes research and development costs)
Classification of costs according to how costs response to changes in activity size (the behavior of hypothesis against activity size)

1. Fixed: does not depend on the level of activity, if the level of activity changes it remains unchanged
2. Variable: changes by changing the level of activity
3. Semi variable: some part is fixed and the other is a function of change in the level of activity

Terms of Environmental Accounting
Environmental Financial Accounting

In environmental financial accounting, companies report for external stakeholders (including investors, potential shareholders, creditors,) based on generally accepted accounting principles (GAAP) so that GAAP is the basis of

environmental accounting. According to environmental financial accounting, costs and liabilities related to environment should be recognized in accounting information system (even future liabilities related to pervious or current activities).

Environmental Management Accounting

In environmental management accounting, identification, collection and analysis of information are performed for internal purposes. In environmental management accounting, quantitative (monetary) and qualitative (non-monetary) information are collected and analyzed because GAAP requirements are no longer dominant so management can use different estimations as well as different types of data for decision making.
In environmental management accounting, "life cycle costing" is considered and employed in decision making on investments, purchasing. Environmental management accounting should also be aware of the amount of consumption of each resource (some number data rather than Rial data) as well as which one has been converted to product and which one to waste.

National Income Accounting

In macro-economy, environmental accounting is used to perform calculations related to costs of underground resources and their flows.

Environmental Reporting

Although environmental accounting involves environmental reporting and environmental performance is important in viewpoint of financial reports users, the goals of economic performance reporting don't correspond with those of environmental reporting, so due to limitations in interests of users, it is felt a need to the reporting requirements.
Since for-profit entities incur expenses as environmental costs, so an image of environmental performance containing benefits arising from bearing the respective costs is difficult to present considering current accounting structure. So many for-profit entities consider environmental costs as cost items without addressing its benefits and don't disclose them in financial reporting effectively.

Disclosure of environmental costs in order to maintain shareholders wealth increases the value of for-profit entities. Although benefits of such costs aren't ratable to Rial, it discriminate the for-profit entities as a green industry. Despite some advantages in maintaining competitive market among similar non green industries, there are useful effects on shares prices of such entities in Exchange Market through creating social popularity. So environmental reporting should be considered by managers more accurately especially in entities bearing high environmental costs.

Environmental Costs

Management accounting as a supporting decision system separated environmental costs from other costs and considers presentation of financial information differently. Cost management is engaged with both external and internal factors in an entity. If external factor is considered as customer satisfaction, cost reduction is performed through identifying its factors and removing activities without added values; the factors range from product design to after-sales services. If external factor is environmental satisfaction, cost reduction through identifying its factors and removing activities without added values is difficult. Sometimes, environmental costs are without ratable added value so the entity is reluctant to remove activities damaging the environment so that it plans to control and reduce the costs of such activities. It means that environmental cost management is possible with the purpose of environmental satisfaction so separation of costs and selection of appropriate indices are inevitable. Environmental cost is included:

Normal costs

They are costs incurred by using raw materials, water, electricity, fuel etc. and capital goods and supplies being considered in industrial accounting and capital budgeting; however, they aren't considered in the category of environmental costs. Nevertheless, less use and waste of raw materials, water, electricity and capital goods and administrative supplies are of environmental advantage leading to reduction of erosion and use of renewable natural resources.On the other hand, whether such costs are considered as environmental costs or no, it is necessary to realize that they are effective in management decision making. Dash-lines around these costs in the diagram indicate lack of attention to them in decision making by entities.

Potential hidden costs

They are costs that may be hidden from management view.

Primary environmental costs

They are the first group of costs created before the production process started, the operation performed, the system designed or the available equipments used. These include costs of locating, designing environmentally-friendly goods, selecting qualified groups supplying goods and services, evaluating equipments of controlling environmental pollution, etc. By considering such costs as overhead or research and development costs, they may be neglected by managers and analyzers when focusing on costs of performing the production operation, designing system or preparing the required facilities.

Required or legal costs

They are costs imposed on the entity as a result of accepting environmental laws and regulations.

Optional environmental costs

These are costs not resulted from observing environmental legal requirements but the entity itself incur them for environmental modification or enhance environmental validity among customers.

Legal or optional environmental costs

These costs occur while utilizing and operating production processes or a series of equipments. Since some companies traditionally consider legal or optional environmental costs as overhead, such costs aren't considered important by managers and analyzers while making commercial and operational decisions.

Contingent costs

Costs of rectifying or offsetting damages due to accidental release of environmental pollutants such as oil, penalties of violating environmental regulations and costs of unexpected outcomes are some examples of contingent costs. These costs are well known as contingent liabilities or costs creating contingent liabilities. At present, inability to identify such costs has led them to not being considered in management accounting system and future decision makings.

Imaginary and communicative costs

Some environmental costs are well known as invisible or less visible costs. This way of definition isn't because of invisibility of such costs but means that direct benefits are resulted from invisible costs. These costs are incurred to affect on the thoughts of management, customers, staff, society and lawmakers and expressed as imaginary-

communicative costs. They include such costs as preparing environmental annual reports, public relations activities and optional costs for environmental activities such as arboriculture.

CONCLUSION

Nowadays many companies face with environmental issues and seek to find an appropriate way for reporting and disclosure of information for public. Environmental pollution is considered as one of the most important problems of human society. This may justify the necessity for employing environmental accounting as an effort to protect environment. Due to developments of industries and incidence of different infections in all countries, it is necessary to formulate and enact environmental regulations especially in the areas where there is more vacuum. Thus the authorities developing guidelines on accounting should provide opportunities of creating and public use of environmental accounting by providing appropriate instructions about how organizations deal with environmental costs.

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RESEARCH ARTICLE

The Effect of Knowledge Management Establishment on Creativity and Productivity of Employees in an Industrial Company (Case Study: Operational Company of Maron oil and gas).

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ABSTRACT

The present study aimed to investigate the impact of knowledge management system establishment on creativity and productivity of employees in an industrial company oil and gas of Maron Company by path analysis. 202 employees were selected in the study. They completed knowledge management, productivity and creativity questionnaires. The results of correlation coefficient showed that there was a positive and significant association between explicit and tacit knowledge and creativity and productivity. The results of path analysis showed that the impact coefficient of tacit knowledge on creativity was positively significant at the level P<0.01. However, the effect of tacit knowledge on creativity was not significant. The impact coefficient of explicit knowledge on productivity was positive and significant at the level p<0.01. But impact coefficient of tacit knowledge on productivity was not significant. Generally, the present study emphasized on the role of knowledge management on creativity and employees productivity.

Keywords: Creativity, Explicit Knowledge, Knowledge Management, Productivity, Tacit Knowledge.

INTRODUCTION

The survival or destruction of all organizations dependent upon the fact how much the units or organizations can create wealth (value added). It means, the value of “results” was more than total value “their consumed resources”

(Kazemi, Abtahi, 1996). Productivity improvement enables the organizations and institutions to develop international competitions and growth and improve their social collaborations. Low productivity shows that an organization wastes its resources and it means finally it leads to losing international competitions and its commercial activities are reduced. Low productivity reduces industry growth of nations and the entire economy (Rana, 1997).Robins believed that a productive organization is the one achieving its goals at the minimum time with the lowest cost (Appelbaum et al., 2005). In industry, productivity is mostly defined as the ratio of input to output in production process. Bernolak (1997) says productivity means how well we used the applied resources in production process. We can increase productivity by producing more goods by similar resources. Or if we produce more goods by a few resources, productivity is increased again. Here,physical and human resources are considered (Tangen, 2005). For survival and having competitive advantage, the organizations and companies are obliged to be a creative and innovative organization to prepare themselves against the rapid global changes. Industrial countries mostly emphasize on creativity training and considered the selection of creative, innovative and futuristic people presenting innovative and creativity solutions for complex issues (Nayer and Jokar, 2012).

Achieving sustainable productivity, creativity and innovation depend upon management and efficient, effective, intelligent and committed human resources. Creativity is an important factor in organizations development and it helps the development of organizational plans and activities via increasing capabilities, facilities and new opportunities. On the other hand, creativity increases flexibility, improves ability and develops organizational learning level (Vatankhah, et al., 2013). Based on the important outcomes of creativity, the researchers are attempted to investigate creativity outcomes. One of the variables effective on creativity is knowledge management (Wanga and Wang, 2012; Zhang et al., 2010; Safarzade, Tadayon and HorMohammadi, 2012). Some researches have been conducted regarding the effect of knowledge management on creativity and innovation and they show that knowledge management has positive effect on creativity (Cavusgil et al., 2003; Liao et al., 2007; Lin 2007).

The aim of knowledge management is maximization of profitability and increasing organizational effectiveness. In knowledge-based era, knowledge management is of great importance. Effective knowledge management needs the people with useful experience in providing knowledge and professional and experienced people provide knowledge and give to those developing organization information reservoir (Ganji, 2004). To increase their ability regarding improvement of goods and services and benefit of customers and consumers, the companies need knowledge. The improved goods and services should be with the changes of systems, structures and problem solving methods (Davenport &Prusak, 1998).

The organizations establishing knowledge management in their main capability have considerable difference than other organizations and some of the changes are the speed of processes, identification and consistency with changes, intellectual asset development and sustainable competitive advantage via continual creativity. Knowledge is active information provides work or judgment about present or future for people. A knowledgeable person can manipulate, discover, disseminate and apply the affairs and realities and above all can give his views regarding various issues and issue the new view to affairs and realties. Indeed, knowledge is the most important source of organization. Such source should be protected, improved and managed and anything providing its better growth should be used and it shouldn't be used accidently. Fundamental change in economy in competitive era based on tangible sources to intangible sources, show the necessity of establishing knowledge management in organizations. Now, more than 88% of organizations considered knowledge management as the main capability or they do it now (Darvish, 2009).Chow (1996) considered the aim of knowledge management in organizations as identification and following collective knowledge of organization to achieve strategic goals and helping the organizations to compete in global era and remaining in it (Metaxiotis&Ergazakis, 2005). Although many researches investigated knowledge management as one of the effective factors on organizational performance improvement (Egbu 1999; Carrillo et al., 2006 and Adenfelt 2010), there are a few studies regarding the effect of knowledge management on employees productivity. Thus, conducting some researches regarding the investigation of the impact of knowledge management and productivity are necessary.

Turning personal knowledge to collective knowledge in knowledge management is important to be applied widely in the entire organization. There are two important points in knowledge application: sharing knowledge and innovation. Based on the above definition, knowledge management is divided into two groups: Managing knowledge and ability to create new knowledge based on rapid environment changes. The second part of knowledge management is mostly considered by organizations. As it leads to the facilitation and increasing creativity and innovation bringing sustainable competitive advantage for organization. Thus, the important goal of knowledge management is creativity (Niazazari et al., 2011).

Based on the review of literature, a few studies investigated the relationship between knowledge management and creativity and organizational productivity. Thus, the basic problem of the present study is investigation of the impact of knowledge management establishment on creativity and productivity of employees by which they can increase the enrichment of research and empirical literature and sometimes improve organizational productivity.

Conceptual model and study hypotheses

Figure 1 shows conceptual model of study. Knowledge management components are considered as independent variable and productivity and creativity are dependent variables. Based on the conceptual model of the study, the hypotheses are as follows:

- There is a positive association between knowledge management components and creativity.
- There is a positive association between knowledge management components and productivity.
- Knowledge management components can predict creativity and productivity.
- There are required grounds for establishment of knowledge management system in operation oil and Gas Company of Maron.

METHODOLOGY

The study method is descriptive and study design is correlation of path analysis as in this study the relations between variables are investigated in the form of causal model.

Study population, sample and sampling method

The study population of the present study is all the employees of Operation Company of oil and gas of Maron. The total statistical population is 1500 people. 306 employees of Operation Company of oil and gas of Maron are selected in the sample. The sampling method is simple random sampling. Of 306 distributed questionnaires, 202 questionnaires were returned.

Measures
Creativity

Creativity standard questionnaire is composed of 50 questions based on Seyed Mohammad, 2009 “Organization and management: research approach” , second edition, Tehran. Terme publications and it is extracted of management books. Cronbach’s alpha coefficient of creativity is 0.85 in the present study. Also, confirmatory factor analysis indices of validity GFI=99, AGFI=0.97 and RMSEA=0.067 showed that the model had good fitting with the data.

Knowledge management

Knowledge management and innovation questionnaire includes 13 questions based on Wanga Wang (2012). The validity of the questionnaire was 0.67-0.81. The results showed that the questionnaire had convergent validity

criteria. It is reliability is supported by Cronbach's alpha as r=0.97. Cronbach's alpha of explicit knowledge is 0.72 and for tacit knowledge 0.81 in the present study. Also, confirmatory factor analysis indices to evaluate explicit knowledge GFI=98, AGFI=0.94 and RMSEA=0.058 showed that the model had good fitting with the data. The confirmatory factor analysis to investigate validity of tacit knowledge GFI=97, AGFI=0.94 and RMSEA=0.049 showed the model had good fitting with the data.

Employees' productivity

To evaluate employees' productivity, standard and normalized questionnaire of productivity self-assessment of Achiew including 32 questions based on Hersey and Goldsmith (1980). The content validity of the questionnaire is supported by management authorities and research method and scientific reliability of measures by split half method (r=0.76). Also, the validity of the questionnaire was Moshabaki 0.83 in 2005 and Haghighatjo 0.89 in 2006. Cronbach's alpha of productivity is 0.85 in the present study. Also, confirmatory factor analysis indices to investigate validity GFI=94, AGFI=0.91, RMSEA=0.057 and showed the model had good fitting with the data.

Data analysis methods

Descriptive indices, correlation coefficient and path analysis are used to analyze data of the study (mean and standard deviation). Path analysis was developed for the first time by Sevilright (1934). Developing regression models and application of multi-variate regression are associated to causal models. Its goal is achieving quantitative estimations of causal relations between a set of variables (Homan, 2008).

RESULTS

Table 1 presents indices of descriptive statistics including mean and standard deviation of the variables.Correlation coefficient of study variables is shown in Table 2. The results showed that correlation coefficient of explicit knowledge with productivity (r=0.44), creativity (r=0.23) is significant and positive at the level P<0.01. Correlation coefficient of tacit knowledge with productivity (r=0.27) and creativity (r=0.32) was significant at the level P<0.01. The correlation coefficient of productivity with creativity is not significant (r=0.09).The tested model with standardized values on each of the paths is shown in Figure 1. The results showed that among the path coefficients, the impact of explicit knowledge on productivity is significant and positive but its effect on creativity is not significant. The effect of tacit knowledge on creativity is positive and significant but its effect on productivity is not significant.As shown in Table 3, 20% of productivity variance and 12% of creativity variance are determined by existing variables in the present study model.The fitting indices of the tested model are shown in Table 4 and goodness of fit of the data of the study with the factor structure of this model was good. Figure 2. Standard coefficients of tested model of the study (* $p < 0.05$ ** $p < 0.01$).The coefficients of direct effect, significance level and determined variance of the study are shown in Table 3.

A single t-test was used to evaluate whether there are required grounds for establishment of knowledge management system in operation oil and Gas Company of Maron.Based on Table 5, t-statistics of explicit knowledge is 3.44, implicit knowledge 8.519 and creativity 24.335 and positive and significant at the level 0.01. In other words, the results of explicit, implicit knowledge and creativity showed that there are required ground for three variables in operation gas and oil Maron Company. T-statistics of productivity is negatively significant and it showed that productivity is lower than average in this company.Friedman test is used to prioritize study variables. Each of the variables had a score and the higher this score, the higher the required ground of the variable. As shown in Table 6, the results of Friedman test showed that at least one of the mean ranks of variables is preferred to other mean of ranks. The results of Table 6 showed that the most important factor is creativity with the mean 3.51. Then, tacit knowledge with the mean 2.55 is in second rank. Explicit knowledge with the mean 2.34 is in rank three. Finally, productivity with the mean 1.60 is less important.

DISCUSSION AND CONCLUSION

The study purpose is the evaluation of the effect of knowledge management establishment on creativity and productivity of employees in oil and gas Operation Company of Maron. The results of correlation coefficient for evaluation of the relationship between knowledge management and creativity showed that correlation coefficient of explicit and tacit knowledge with creativity was significant and positive. This finding is in line with the results of the study of Safarzade, Tadayon and Hormohammadi (2012), Niazazari, Barimani and Haji Gholikhani (2011), Samadian and SeyedAlavi (2011), Amani (2008), Rahimi (2007), Fathian et al., (2005), Fararesi et al., (2012), Hind (2008) and Wall (2005). This result showed that creativity is created when organizations distribute power, information, knowledge and rewards in organization. Knowledge management facilitates knowledge uniformity among the groups and dispersed work units and also facilities knowledge among the groups. Knowledgeis uniformed rapidly and effectively. In addition, knowledge management provides tools, processes and infrastructures for knowledge sharing among the employees and affects creativity of employees. Thus, without knowledge in organization, creativity is impossible. In other words, innovation and creativity are not created alone and they need required conditions. Knowledge is a tool by which people interact or achieve new knowledge (Rading, Allen, 2004). In addition, knowledge provides a set of required recognitions and skills to solve a problem. When others share their knowledge, knowledge is developed and if one's knowledge is combined with others knowledge, new knowledge is created (Rading, Allen, 2004) and leads to creativity.

The results of correlation coefficient to investigate the relationship between knowledge management components and productivity showed that correlation coefficient of explicit and tacit knowledge with productivity was positive and significant. This result is in line with the results of Zhang et al., (2010), Wanga and Wang (2012), Lee, & Choi (2003) and McKeen, and Zack (2006). This finding showed that knowledge sharing in the company causes the growth opportunities are provided in professional path for employees. The employees participate in at-service training courses and they know their jobs in accordance to their talent and they can be successful in their job duties. Required knowledge and information of job affairs are given to them and they have the support of organizational units and they have better conditions for improvement, they have high participation in the decisions of their work and they are more excited to do the duties and they are happy to work in the company.

Dayer and Noboka (2000) stated that knowledge sharing helps the people in various groups work with each other and facilitates knowledge exchanging among them and increases learning in organization and the capability of fulfilling individual and organizational goals. Thus, they increase employees' productivity. In addition, to improve employees' productivity and coping up with the competitors, the companies should have competitive advantages to have a good performance in the complex and varied conditions and survive in markets. To achieve better performance and competitive advantages, the company's investment in tangible resources is changed to investment in intangible resources (Sinayi et al., 2011). In new economy, knowledge is considered as a strategic factor in achieving sustainable competitive advantage but it is not valuable only to have knowledge assets and sharing it with other members inside or outside the organization causes thatnew value creation knowledge assets are provided (Gholizade, 2010) and this leads to the productivity of employees and organization.

The results of path analysis showed that the impact coefficient of tacit knowledge on creativity was positive and significant but the impact coefficient of explicit knowledge on creativity was not significant. Thus, tacit knowledge can predict creativity but explicit knowledge can not predict creativity. It can be said that tacit knowledge provides required conditions for creativity and innovation among the employees but the mechanism of transferring is different from that of explicit knowledge. In addition, tacit knowledge is effective on views, subjectivity, values, emotions and individual measurments. Thus, it can be said tacit knowledge is effective on creativity of employees to adapt the services and productions with the changes. Thus, a good space should be provided to transfer this knowledge and creating communication of employees as tacit knowledge is transferred mostly via language without physical display of skills.

Another result of path analysis showed that the impact coefficient of explicit knowledge on productivity was positive and significant. But the impact coefficient of tacit knowledge on productivity was not significant. Thus, explicit knowledge can predict productivity but tacit knowledge can not predict productivity. This result showed that the companies need explicit knowledge to increase their ability in productivity improvement. The improved goods and services should be with the changes of systems, structures and problem solving methods (Davenport &Prusak, 1998). The goal of knowledge management is maximizing profitability and organizational effectiveness and knowledge as a source of survival and improvement of productivity of organizations is vital. The success condition and organization productivity is achieving deep knowledge understanding in all levels. Thus, the companies are obliged to use knowledge sharing to improve productivity. A single t-test was used to evaluate whether there are required grounds for knowledge management establishment in oil and gas Operation Company of Maron. The results showed that t statistics of explicit knowledge (3.44), tacit knowledge (8.519) and creativity (24.335) were significant at the level 0.01%. Thus, there are required conditions for knowledge management establishment based on three variables in oil and gas Operation Company of Maron but t- statistics of productivity was negative and significant and it showed that productivity in this company is below average. The results of Friedman test to prioritize variables showed that the most important factor is creativity. Then, tacit knowledge is in second rank. Explicit knowledge is in third rank and then productivity is less important.

Totally, the study results showed that when employees transfer their knowledge to others and develop organizational knowledge bases, the ground is prepared for employees' creativity along the continual organizational changes and affects employees' productivity. The important points in knowledge exchange are as follows: the co-workers are motivated and are inclined to present their knowledge and the systems and structures support knowledge transfer process and knowledge exchange is recognized in the entire organization. This stage enables the beneficiaries and users of knowledge to solve the organization problems by created knowledge. Using knowledge for solving specific problem leads to new knowledge creation and production and this knowledge is stored and evaluated again. Generally, organization knowledge should be used in creating processes, services and products of organization practically. If the organization can not apply the created knowledge practically, it can not achieve competitive advantages. Aypen (2000) believed that individual knowledge increases organization productivity, if it is shared in the entire organization (Cummings, 2003). The first step in knowledge management is to provide the required environment for facilitation of knowledge sharing between the people and groups in organization (Zhang et al., 2006).As intellectual capital and knowledge is the basis of main qualifications and a strategy for better performance, knowledge has strategic role if the organization can use it in value creation activities and applies instrumental knowledge to make existing opportunities in competitive market into practice. Because it is not possible for other companies to keep their competitive advantage by doing the tasks rapidly and competitive advantage is possible if the tasks are not imitable by others. Considering existing knowledge and effective use and creating a structure to use new knowledge in achieving sustainable competitive advantage is of great importance. The organizations should consider all affairs as knowledge management as a working strategy acts in entire organization at the same time and is a progress tool of general plan of an organization.

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Table 1- Descriptive indices of study variables

Variables	Mean	SD
Explicit knowledge	19.02	4.21
Tacit knowledge	23.83	4.72
Productivity	67.65	13.85
Creativity	88.68	11.49

Table 2.Construct correlation matrix of study

Variables	Explicit knowledge	Tacit knowledge	Productivity	Creativity
Explicit knowledge	1			
Tacit knowledge	0.34**	1		
Productivity	0.44**	0.27**	1	
Creativity	0.23**	0.32**	0.09	1

* p< 0.05 ** p < 0.01

Table 3.The results of direct, indirect and total effects coefficient

Path	Direct effect	t	Determined variance
On productivity from Explicit knowledge Tacit knowledge	 **0.40 0.11	 5.79 1.66	20%
On creativity from Explicit knowledge Tacit knowledge	 0.12 **0.28	 1.72 3.86	12%

* p< 0.05 ** p < 0.01

Table 4.The features of fitted model fitting

X^2/df	RMSEA	CFI	GFI	NFI	AGFI
0.55	0.000	1	1	1	0.99

Table 5.Single t-test to evaluate the establishment of knowledge management system

Variables	Mean	SD	Mean difference	t	df	Significance level
Explicit knowledge	3.17	0.70	0.17	3.442	201	0.001
Tacit knowledge	3.40	0.67	0.40	8.519	201	0.001
Creativity	3.85	0.50	0.85	24.335	201	0.001
Productivity	2.82	0.58	-0.18	-4.465	201	0.001

Table 6.Prioritization of each of the variables by Friedman test

Required grounds for establishment of knowledge management	Test result	Rank
Creativity	3.51	1
Tacit knowledge	2.55	2
Explicit knowledge	2.34	3
Productivity	1.60	4
Test statistics (Friedman test)		
Chi-square	Degree of freedom	Significance level
228.765	3	0.001

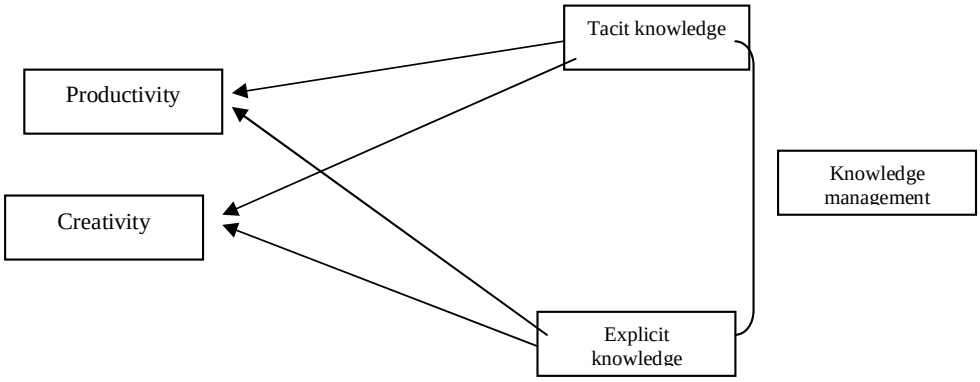

Figure 1.Conceptual model of the study

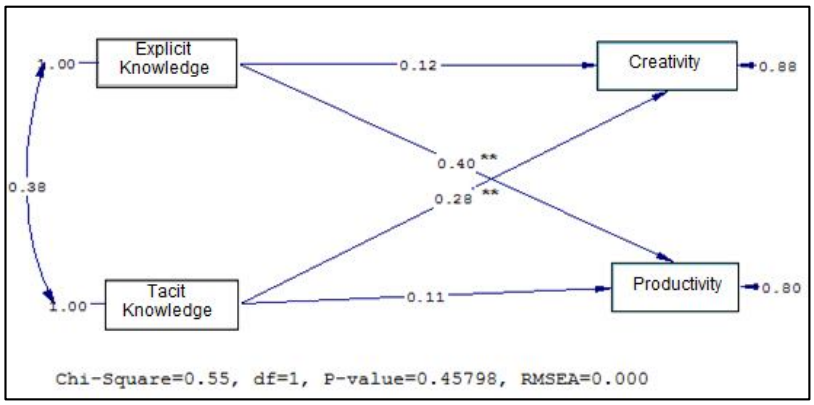

Figure 2. Standard coefficients of tested model of the study

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RESEARCH ARTICLE

Phytochemical Screening and Antioxidant Activities of Some Selected Medicinal Plants.

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ABSTRACT

Medicinal plants have been used for centuries as remedies for human diseases because its contain chemical components of therapeutic values.Phytochemical in vegetables have received great deal of attention mainly on their role in preventing diseases caused as a result of oxidative status which release reactive oxygen species such as singlet oxygen oxidative stress has been shown to play an important role in the development of various diseases.The ethanolic extract of *Coccinia grandis (leaves), Oldenlandia corymbosa andIindigofera aspalathoides* were evaluated for their antioxidant activity against dichlorobenzene induced hepatic toxicity was studies.The level of GSH, superoxide dismutase (SOD), glutathione peroxidese (GPx) and catalase were reduced in toxicity induced rats. On the contrary, increases activities of liver GSH, SOD, GPx, and CAT were observed in rats administred with different doses of plant extract (*Coccinia grandis* 100 mg / kg) *Oldenlandia corymbosa* 200 mg / kg and *Indigofera aspalathoides* 300 mg / kg). The free radical scavenging and antioxidant activities may be attributed to the presence of phenolic and flavonoid compounds. The results obtained in the present study indicate that the leaves of these plant extracts are a potential source of natural antioxidants.

Keywords: *Coccinia grandis, Oldenlandia corymbosa, Indigofera aspalathoides*,free radicals, antioxidant.

INTRODUCTION

The medicinal plants, which form the backbone of ftraditional medicine, have in the last few decades been the subject for very intense pharmacological studies. Phytochemicals have been used as drug for many centuries.The reactive oxygen species are generated continuously in the body by both endogenous and exogenous factors like normal aerobic respiration and various pollutant like tobacco smoke, radiation, organic solvent and pesticide [1,2]. These species cause the cellular damage and produce various metabolic disorders [3].The secondary metabolites from medicinal plants function as small motecular weight antioxidants and slow the process of oxidative damage. Antioxidants are agents which protects biological system against the potentially harmful effects of processes or reaction that can cause excessive oxidation.Antioxidants can be classified into two major classes i.e., enzymatic and non – enzymatic. The enzymatic antioxidants are produced endogenously such as superoxide dismutase, glutathione peroxidase and catalase. The non – enzymatic antioxidants include tocopherols, carotenoids, ascorbic acid, flavonoids and tannins which are obtained from natural plant sources[4].

Coccinia grandis linn (Curcurbitaceae) is a perennial branched handsome tendril climber, distributed throughout india.The leaves also contain triterpenoids, alkaloids and tannins etc.[5] and glycoside [6].The leaves of the plant possess antidiabetic, analgesic, antispasmodic, wound healing, antiulcer, antipyretic, antiinflammatoy and antimicrobial activity[7,8].Plant derived natural products such as flavonoids, terpenoids and steroids etc have received considerable attention in recent years due to their diverse pharmacological properties including hepatoprotective and antioxidant activity[9,10,11].

Oldenlandia corymbosa (L) (Rubiaceae) is a weedy herb, widely distributed throughout india. It is commonly known as 'parppatakapullu' in traditional medicine of kerela. *O. corymbosa* in extensively used in modern Chinese practice for the treatment of viral infections, cancer, syndromes involving " toxic heat " acne, boils, skin ailments, hepatitis, eye diseases and bleeding [12]. The palnt is used for treating venomous bites, diuretic, expectorant, hyperdypsia, giddiness, flatulence, constipation, cough , necrosis and liver diseases[13,14,15].*Indigofera aspalathoides* (leguminosae) is commonly known as ' Shivanarbembu' in tamil. The leaves, flowers and tender shoot are said to be cooling and demulcent, dccoction for leprosy and skin infections [16]. The whole plant in used for treatment of abscesses, tumors, hepatitis, liver disorders and cancer[17,18,19].The free radical scavenging and antioxidant activities may be attributed to the presence of phenolic and flavonoid conpounds.Therefore in the present study, to investigate the phytochemical composition and antioxidant activity of *C. grandis* (leaf), *O. Corymbosa* (aerial part) and *I. aspalathoides* (leaf) extracts.

MATERIALS AND METHODS

Plant materials and extraction

Fresh leaves of *C.grandis* and *Indigofera aspalathoides*, aerial part of *O. corymbosa* were collected from the field of pudukottai area, Tamil Nadu, India. The collected materials were washed with tap water and dried in the shade for several days.Then the materials were powdered mechanically and extracted with 80% ethanol using soxhlet apparatus. The greenish black residues was obtained and stored in airtight container and kept in refrigerator for further uses.

Animals

Health albino rats of either sex, weighing 150-200g were procured from 'Srivenkateswara Enterprises' Bangalore, India.They were housed in clean sterile polypropylene cages with proper aeration and lighting throughout the experimental period. During the course of the experiment, the temperature was maintained between 27^0 C ± 2^0. The animals were fed with commercially available pelleted rat feed and water *ad libitum.*

Experiamental design

The experiments were designed to study the invivo antioxidant effects of *C.grandis, O.corymbosa* and *I. aspalathoides* extracts on DCB induced liver injury. The rats were divided into 4 groups, each group consist of 6 animals.

Group I : Animal received only diet and water
Group II: Animals received DCB only
Group III: Animals received DCB + C. grandis (100 mg /kg) body weight.
Group IV: Animals received DCB+ O. corymbosa (200mg kg) body weight
Group V : Animals received DCB + I. aspalathoides (300mg/kg) body weight.

At the end to the experimental period the rats were fasted overnight and killed by cervical dislocation.The liver was surgically removed washed with cold physiological saline. The tissues liver was minced and homogenized10 mm Tris – Hcl buffer at a concentration of 10% w/v with Teflon homogenizer at a speed of 2500 rpm for 10 minutes. The supernatant was separated and used for various biochemical estimation (Animal ethical clearance is obtained).

Statistical Analysis

The results obtained were reported as mean ± SD (standard deviation) to 6 animals in each group.The data obtained from this study was analyzed statistically using Duncan's Multiple Range Test (DMRT). Differences were considered to be statistically significant at $p < 0.05$.

RESULTS AND DISCUSSION

The preliminary phytochemical studied revealed the presence of alkaloids, steroids, carbohydrate, flavonoids and pheolic compounds etc(Table1). The levels of GSH and activities of SOD, CAT and GPx in the DCB treated rats (Group II) were found to be lower than the control. The rats treated with *C. grandis, O. corymbosa and I. arpalathoides* extracts, the activities of the antioxidant enzymes were enhanced and restored to normal levels.The antioxidant activity of these plants extracto due to their active constituents (Table2).Nature has been a source of medical agents for thousands of years and impressive number of modern drugs have been isolated from natural sources.Various medicinal plants produce a diverse range of bioactive molecules making them a rich source of different types of medicines[20].Phytochemicals are widely used to promote human health. Now a days pytochemical in vegetables have receiving a great deal of attention mainly on their role in preventing diseases caused as result of oxidative stress which release reactive oxygen species such as singlet oxygen and various radicals [21]. Preliminary phytochemical screening indicated the presence of flavonoids, have been shown to possess antimutagenic, antimalignant effects and antihepatotoxic activity [22,23].

Free radicals are known to play a vital role in wide variety of pathological manifestations.Antioxidant fights with free radicals and protect us from various diseases. They exert their action either by scavenging the reactive oxygen species or protecting the antioxidant defence mechanism. Phenolics are ever – present secondary metabolites in plants, its scavenging ability due to the presence of hydroxyl groups [24,25].

GSH, one of the major tripeptide non- enzymatic biological antioxidants present in the liver, in concerned with the removal of free radicals and maintenance of membrane protein and thiols, and a substrate for GPx.Deficiency of GSH within the living organisms can level to tissue demage and injury [26]. Similarly, in the present study the liver GSH content reduced in the Dichlorobenzene treated rats was significantly enhanced after C. grandis, O. corymbosa and I. aspalathoides treatment, confiriming its capacity of removing free radical and reducing peroxidation.SOD, CAT and GPx are important scavengers of superoxide ion and hydrogen peroxide. These enzymes prevent the generation of hydroxyl radical and protect cellular constituents from oxidative damage. The level of SOD, CAT and Gpx were

reduced in dichlorobenzene induced rats. Treatment with *C. grandis, O. corymbosa* and *I. aspalathoides* extracts significantly increase the activities of antioxidant enzymes. The presence of high phenolic and flavonoid content in these plant extracts has contributed directly to the antioxidant activity by neutralizing the free radicals. Then our present study, suggests that *C.grandis, O.corymbosa and I. aspalathoides* possess antioxidant activity and increase life span.Among these three plant extract *C. grandis* showed high level of antioxidant activities than the other extracts and also used as powerful antioxidant agent.

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Table :1.Phytochemical analysis of *C. grandis, O. Corymbosa, I. aspalathoides*

Test	*C. grandis*	*O. Corymbosa*	*I. aspalathoides*
Alkaloids	+	+	+
Carbohydrate	+	_	_
Flavonodis	+ + +	+ +	+ +
Phenotic Compounds	+ +	+ + +	+ +
Saponins	+	+	_
Tannins	_	+	_
Terpenoids	+	_	+
Steroids	_	_	+

Table :2.Changes in the activities of antioxidant enzymes in liver of control and experimental rats.

Groups	SOD (Unit/mg of protein)	CAT (Unit/mg of protein)	GPx (Unit/mg of protein)	GSH (Unit/mg of protein)
Group I	9.25 ± 0.45	19.56 ±2.33	16.25± 1.98	27.35±2.71
Group II	6.30 ± 0.28	7.98 ±2.06	8.12 ± 0.72	16.74 ± 1.81
Group III	8.17 ± 0.19	16.85 ±1.98	13.51 ± 2.05	25.45 ± 1.28
Group IV	7.82 ± 0.16	14.60 ± 2.11	12.14 ± 1.53	24.50 ± 2.16
Group V	7.11 ± 0.12	12.73 ± 1.25	10.93± 1.72	23.19 ± 1.58

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RESEARCH ARTICLE

Studying Geomorphic Indexes of Yazd's Desert Areas.

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ABSTRACT

A large area of Yazd state is desert. One of the most important regions of this area is Abarkouh desert. And as an "ecological system", it has some geological characteristics such as land material, different geomorphological materials, slope, geomorphological conditions and etc. which acknowledging interaction relations of these variables on each other is an important point that it's outcome, determines quality and quantity potentials of desert, which approaching them is one of the goals of this research. To approach this goal, some documents such as aerial photos, 1/50000 and 1/250000 topographic maps, geology maps with the scale of 1/100000 and 1/250000 and satellite photos and field observations and laboratory researches are used for the study. In total, studies on this research are discursive, which depends on explaining general theory of systems, and information about relationship survey and statistical methods about their regression is analyzed and point data has converted to determined data by using GIS techniques. According to divisions, deserts have different kinds such as bloated, wet sticky, polygon, water- bearing and etc. results show that a noticeable part of Abarkouh desert extension is dedicated to bloated lands, and clay- molecular network, which usually is in the shape of a polygon, has demonstrated in this sediments in a special way.

Keywords: Abarkouh, Playa, Geomorphic Characteristics, Surfer, Yazd.

INTRODUCTION

Desert is one of the formic views of Iran's geomorphology and it is a geomorphic landscape inspite of some people who announce this view unit as a wild land,because wild land is a continental. While desert is a morphology word and it never means loss of water. In fact sometimes it is the place for weedy waters and it worth noticing that if there is not any water in the desert, the life of desert, which is more a function of salinization procedure, would be stopped Servati(1381). Considering this contextual difference, makes it obvious that the presented statistics from desert regions of Iran which is a noticeable percentage of Iran's land, could not be true. Because most of the time, people who rely on these statistics, have announced desert regions with wild land regions. One of the researchers who has studied Iran's deserts from a geomorphological view is Daniel Krinsky(1970) which his proposal subject was the deserts of Iran. And his goal was to identify the capabilities of geomorphic landscapes in building emergency airports. His studies were protégé of USA army at 1970. Studies that foreign researchers have done about geomorphology of Iran, are more of a paleo climate. These studies were for specifying continental terms of Iran in periods of fourth epoch and paleo climate. Considering that new detection methods of continental effects were not update in the past, most of the researchers containing geologists and geographers, who have studied Iran geomorphology have paid attention to continental rebuilding of the past terms based on geomorphology data. One of these Iranian researchers who has done deep researches about the deserts of Iran is Ahmad Mostofi (1368) who has done worthwhile studies about Meseeleh and Lout desert. ParvizKardani (1386) has studied this subject in " the big central desert (salt mash) of Iran and it's neighborhoods" book and has expressed many fundamentals about deserts. Also FarajollahMahmoudi (1350) which has codified most of the evidences related to deserts of Iran institute in association with university of Tehran and Hasan Ahmadi (1385) in second volume of "typical geomorphology about deserts of Iran" has expressed some points. MohammadrezaServati(1381) has expressed some other points about this subject in an article with the title of "geomorphological specifications of Iran desert areas". Additionally AtaollahGobadian(1362) in " natural views of Yazd state" book has expressed some points about Yazd state deserts. Also it worth mentioning studies of Ahmad Motamed (1370) about Yazd deserts. Each one of geomorphological perspectives can play a special role in extension of areas. Because of being Yazd state as an area with desert perspectives, containing a large extent of its area, recognition and identifying this perspective and provision of development programs to exploit them can't be neglected. In general, it could be said that Yazd state has several desert perspectives like Siahkouh desert, Abarkouh desert, Dar Anjir desert, Harat and Marvast desert, Saghand desert and etc. Among these collections, Abarkouh desert is the second desert from breadth view which has been stretched like a hole from the west side of Dehshir to Abarkouh city. Extraction, preparation or any kind of using from this perspective units for a state like Yazd, is very important and performing any regional preparation plan in this state without consideration desert perspective, can't complete development and civil ring.

Planetary position of Yazd state

From climatology view, the planet earth divides to different environmental zones, which are equatorial, tropical, subtropical, moderate, adjacent arctic and polar. In other words, from the equator to 30 degrees latitude is called warm area, from 30 to 60 degrees are is called warm area, and from 60 to the poles in both hemispheres is called cold area AlayiTalegani(1382). Yazd state is between 29 degrees 52 minutes and 35 degrees 10 minutes north which they both are in tropical area and subtropical area. In other words it is between warm and moderate areas (Fig1).

MATERIALS AND METHODS

To check performed developments, these steps have been followed during the study:

Temperature and its properties in Yazd state

In general it could be said that temperature is one of water determination factors in every area Montazeri(1376). It could be understood from studying temperature in this state that average temperature in studied stations in Yazd

state changes from 11.82 in Neyr to 22.95 in Tabas. The average annulal minimum temperature was related to stations that are studied in highlands of the state. And the maximum temperatures are for Tabas, Bafgh and Yazd stations at summer. To estimate annual average temperature and to prepare maps, the area's temperature could be obtained by annual temperature average and height of each station could be obtained by using regression equation with determination factor of R2= %85.(Fig2,3).

Equation1 T= -0.0057H+26.591

Evaporation and its properties in Yazd state

On way of water loss in different environmental areas of Iran is evaporation and sweating. Therefore evaporation and sweating are among parameters which affect this arid and semi- arid climate more than other things Allen et al (2003). To estimate annual evaporation map of tha area using annual evaporation average and each station rain amount, evaporation gradient can be obtained by using regression line equation with determination factor of R2= %78.

Equation2 E= -10.925p + 3854.8

By transferring this equation to top graphic coordinates in SURFER software, evaporation map is obtained (Fig4,5).

Analyzing rain in Yazd state

Rain is one of general and important climatic parameters which is made of steam particles density under effect of air climb and temperature decreasing at upper layers of the atmosphere. Yazd state which has mountains and plains also, is affected by these situations. Analysis of annual rains shows impressive changes in all over the state, in a way that at most stations located in desert region, rainfall is less than 100 mm. The rain curves map in the state (fig6,7) shows that by proceeding from Shirkouh highlands toward its southern and western slopes, rainfall decreases with height reduction approximately Omidvar(1385). To make the rain map of the state, the relationship survey between rain and height of about 20 stations was checked and a relation with regression factor pf R2= %79 was obtained.

Equation3 P= 0.0904X- 58.669

The rain map of Yazd state is resulted from transferring this equation to the height coordinates through creating a GRD file in SURFER software. According to the rain map of Yazd state and also by analyzing rate curves, it could be understood that the main rain peak is 220 mm per year at the top of Shirkouh highland in south of the state. And affected by existing cooling system, the most solid rain volume pours in this area which has an undeniable role in securing water resources of Abarkouh plain.

Humidity and humidity characteristics in Yazd state

Humidity is another effective factor in securing or destructing comfort level of climates in a way that its rate in creating humid conditions at wild land areasis one of limiting factors of comfort. Comparative humidity refers to the amount of humidity in atmosphere which is calculated from existing humidity amount ratio in atmosphere, to maximum power of humidity absorption in atmosphere and is expressed percentile Alizadeh (1374). To check relative humidity in the state, recorded amounts in climatology synoptic stations in 15 years period are used. After evaluation of relative information in existing stations at the state for humidity map extraction, at first, the relationship survey between temperature and humidity for stations was done and regression factor of R2=%62 was resultd.

Equation4 M=-0.07635t+47.604

Yazd state humidity map, is a resultant of transferring this equation to highlands coordinates using a GRD file at SURFER software. Because of inappropriate height scattering or lack of water resources in the main parts of the state, Yazd state doesn't have an appropriate condition in humidity for all months of the year. The stations located in mountains, have more relative humidity. The topmost average of annual humidity maximum related to Nasrabad is about %52.8 and the lowest average of relative humidity minimum belongs to Bafgh, Yazd and Tabas(fig8, 9).

Inequality and its characteristics in Yazd state

From inequality view, Yazd state is very different, in a way that height difference between the highest spot of the state is in Shirkouh with 4705 meters height and the lowest spot of the state is in Tabas city with 690 meters height (about 3375 meters). Lowlands of the state are separated from each other by mountains. Transmittal of height and plains influences continental condition and distribution of resources of surface water and underground water and consequently access to water resources and appropriate climate. Checking topographic conditions of Yazd state resources show that highlands are established in the middle and flat pages, lowlands and generally deserts are established between highland sand around the state.

Deserts of Yazd state and their spatial distribution

Desert regions of Yazd state is divided to these areas: Ardekan desert (Siahkouh) which is the most important and the most frightening desert in the region which is in the shape of a horseshoe at northeast of Ardekan from northwest to southeast direction. The most famous desert region of Yazd state is Abarghou desert which is in the shape of a circle between two mountains. And Saghand desert, Daranjir desert, Harat and Marvast desert, Bahadoran desert (Mehdi Abad pan), Taghestan desert, Siahtagh desert, Abgir desert, Allah Abad desert, Tal Hamid desert, Tarighol Rezadesert, Gourabkhor desert, Parvadeh desert, Loutak desert, Siahkouh desert form the deserts of state. Area of each desert, based on digital soil survey in geographical information system is equal to: 1- Tarighol Reza desert: 15875 square kilometers, 2- Abarkouh desert: 12815 square kilometers, 3- Daranjir desert: 10157 square kilometers, 4- Parvadeh desert: 10124 square kilometers, 5- Tal Hamid desert: 4559 square kilometers, 6- Siahkouh desert: 4428 square kilometers, 7- Siahtagh desert: 4129 square kilometers, 8- Gourabkhor desert: 3715 square kilometers, 9- Loutak desert: 9566 square kilometers, 10- Saghand desert: 1761 square kilometers, 11- Marvast desert: 1443 square kilometers, 12- Mehdi Abad pan desert: 1123 square kilometers,13- Taghestan desert: 981 square kilometers, 14- Abgir desert: 629 square kilometers, 15- Allah Abad desert: 900 square kilometers(fig10).

Effect of geology elements on morphology of Abarkouh desert

From division of the geological survey of Iran view presented by Stoklin (1968) and Nabavi (1355), Abarkouh desert, locates between central Iran and Sanandaj- Sirjan zone. In Stoklin'sview (1347),Abarkouh region is considered as a component of Neogene- quaternary basin, which is formed in the late Miocene that its floor is in quaternary and even right now has gradual subsidence which the mentioned desert is like a closed basin that has a wild land's condition. Considering that the subject of this project is about geomorphology of Abarkouh desert, therefore in geology section, it is not all purely geological. But here, geological problems are discussed from a geomorphological view. This means that all of the studied regions geology elements are discussed first and then the involvement of these elements on form creation and effective processes are discussed. For example, the primary conditions of a desert creation are geological structures of the area, so that adiabatic holes are formed in a way that this place becomes a safe home for sediments carried by water, considering the questions that where did these minerals and elements come from and what changes have happened to them that have resulted formation of sediments in desert surface. On the other hand desert is the place for burying around sediments which these sediments are washed during different environmental

periods and are accumulated on desert surface which each one of these sediments can play different roles in forming the desert. Some of these roles are critical and some have less roles in forming the quality of the mentioned desert.

Sedimentology of Abarkouh desert

Outcrops of the area include silurian shale and sandstone which are covered by a shale and sandstone and coal-bearing shale and sometimes yellow and brown devonia dolomite. On these formations, Jamal formation could be observed with relatively large area. Jamal formation could be seen in this region with between layer gray limestone lithology and sometimes with sandstone and Permian shale base. This formation has made a suitable condition for rainfall infiltration with having seams and many faults. Abarkouh desert central part sediments are granule and its particles include all of around series which alluvial of this area has sand which is an effective factor in decreasing porosity of mentioned sediments. These sediments are formed from clay, plaster, sand and salt which is like a salt marsh river in most of interior points where the water level is high. At summer the mentioned sediments become in the form of salt hollow cones.

The Abarkouh holes origin

Geologists learned that the creation reason of the more of the holes in Iran is tensile strains and they relate their formation to horst builds and grabny(fig11) Darvishzadeh(1370). But it shouldn't be neglected that grabny concept doesn't refer to all holes.Grabny refers to embayments that are due to tensile forces. And even falling blocks should have happened during this process and because of applying tensile forces, deep basalt penetration anticipating at the margins of such embayment is not off of probability.

Landscapes and formic units in studied region

In geomorphology, landscape is the biggest formic unit and every landscape can include land view. Geomorphic views include territorial surfaces and their characteristics are evaluated in this section. The third unit in formic classification is land feature. This unit expresses the influence of forms from texture and material of lands based in their resistance against erosion and is reflected as parent materials in geomorphic maps. In fact, this unit determines the relation between parent materials and land forms. The smallest and the last divided unit in geomorphology is land form. In this unit, geomorphology phenomena is identified and symbolized according to the process(fig12).In general morphology view, Abarkouh desert is surrounded by around mountains from different directions. Ala mountain in northwest, Siahmountain and Gouri mountain in west, Eysh mountain in northeast, Dare Deraz mountain andAmirGholiKhani mountain in southwest and PanjAngosht mountain in east are the major mountains surrounding the hole(fig13).

RESULTS

Generally it could be said that the desert is one of predominant landscapes of Yazd state and these landscapes couldn't be forgotten in patterns of regional development, anyway. Because of that, the view and the axis of this project in studying Abarkouh desert is devoted to development of this region mostly. Results of this set are mostly basis produced information for major development of the region. But, to stabilize every extension, its spatial characteristics should be able to produce spatial identity. And if such thing doesn't happen at the process of places and sites extension, there is no guarantee for stabilizing that. Yazd state has very various desert landscapes like Siahkouh desert, Abarkouh desert, Dar Anjir desert, Harat and Marvast desert, Saghand desert and etc. between these deserts, Abarkouh desert is the second biggest desert and is extended like a hole from Dehshir to Abarkouh. Therefore logistics or utilization and any other use from this landscape units, has an important role for Yazd state. And performing any land use plan in this state without noticing desert view can't complete civil and development ring. It should be considered that however the studies in this paper are more theoretical, but relying on theorizing

has an important role in developmental decisions and development without theorizing often makes more problems instead of solving regional problems that resolving them wouldn't be easy.

DISCUSSION

The primary checks show that plains between Zagros mountains in the shape of bands between anticline leading to a coastal is a lot. Although the regions climatic changes are mostly the same,but a coastal is not the same from geomorphologic view. Some of these lakes or holes, don't have terrace in contrary to the general role. In other words, geomorphic evidences have not proved their surfaces water fluctuation. While the available climatic information presents that these areas have had climatic and humid fluctuations and therefore, their water surface should have recorded such fluctuation at its coastal margins as a lake terrace. More scrutiny in this field shows that lakes with general height more than 2100 meters were not able to make terrace because of cooling and freezing and some of other lakes in Zagros owe their water fluctuation to water escaping from karsts of the region. Multiple terraces observed in some parts of Abarkouh hole, represent balance changes of this hole in past exactly. But the reason that in all coasts of this hole, such phenomenon couldn't be observed is due to erosion and tectonic. Abarkkouh desert is a live desert. Because there, salinization process is performed well and there is nothing like a desolate desert yet. But if the entrance to Abarkouh desert reduces more than now, certainly there would be problems in salinization process and this means desolation of the desert and the desert will die completely (fig14).So if a lake or a special thickness of water couldn't be observed, it doesn't mean that there is no water and no salinization process in that desert. But it is getting closer to that situation and the life in there is not in danger yet. Some actions have done in the northern part of the state by Regional Water organization of Yazd state and it is construction of dams on the main lakes path pouring to this hole. This job not only helps underground water resources, but also the desert is extending at upstream and in near future it will lead the desert to death (fig 15).

Deserts are divided to several types like bloated wet sticky desert, polygon desert, watery desert and etc.

At the studied region bloated face type could be observed which are like 2 separate pieces on clay surfaces. In fact these two pieces are the first demonstration s of the desert the more it is progressed to the north, the more increase at the extent of this type happens. Bloated surfaces are resulted by salt rise because of capillarity force and its crystallization between clay types.

Clay type

Different rivers after entering to playa of Abarkouh, accumulate their fine- grianed sediments in the form of clay surfaces as the slope of ground decreases. Clay sediments form a part of playa in southeast region of the desert and has outreached along northern and southern margin like a narrow band, having a slope less than one percent and a height difference less than half meter and a flat surface with fine- grianed sediments, containing an area about 25 percent of this region.

Wet type

In northwest margin near the two main rivers pouring to the hole from northwest side, it could be seen that these surfaces which have a very low slope, have vegetation of everglade shrubs salsola. Existence of these plants is because of water's low quality, but salinization doesn't happen in there. However these surfaces are not so big in extent, but in total, plane surfaces have created a special perspective at the view of observer (fig 16).

Bloated surface type

These lands engendered in the main substrates of playa and wet edges, have plain surfaces and roughness, that capillarity process with salinization could be seen in that. A noticeable part of Abarkouh desert extent is dedicated to these type and clay molecular nets which usually are in the shape of a polyhedral, have demonstrated in these sediments in a special way (fig17).

Salt polygon type

Because of extreme warmth, mud and salt layers expand and find the way put by seams and create salt polygon desert which their form is various and depends on different factors which the most important ones are:
.around water level
.existing mineral amounts in water
.fine- grianed sediments which are effective in capillarity force power
.evaporation rate
Which this type could be observed at the margins of rivers pouring inside of desert (fig18).

Clay- salt bloated lands type

It has dry and porous surface which are created because of land inflation and rising ground waters due to capillarity force properties. The bright part of these surface which has salt, is dry and compact and its color is generally light brown. But the color gets bolder when it rains and if a car moves on that, obvious effects would remain in salt polygon margins (fig19).

Formation of surface salt type at lands in water

It is usually flat and with tiny bumps and hard salt crust which the salt covers that as a hard stick layer. Which at the water existing under these layers, some interesting formation could be observed. And this type could be seen in water wills of salt rivers ranges pouring to desert, which are extended at the center of Abarkouh desert (fig 20).

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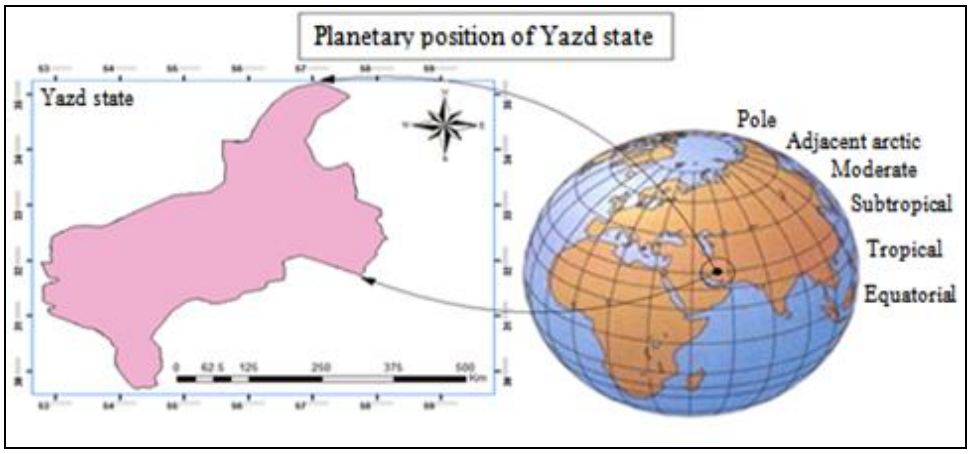

Figure1: Planetary position of Yazd state

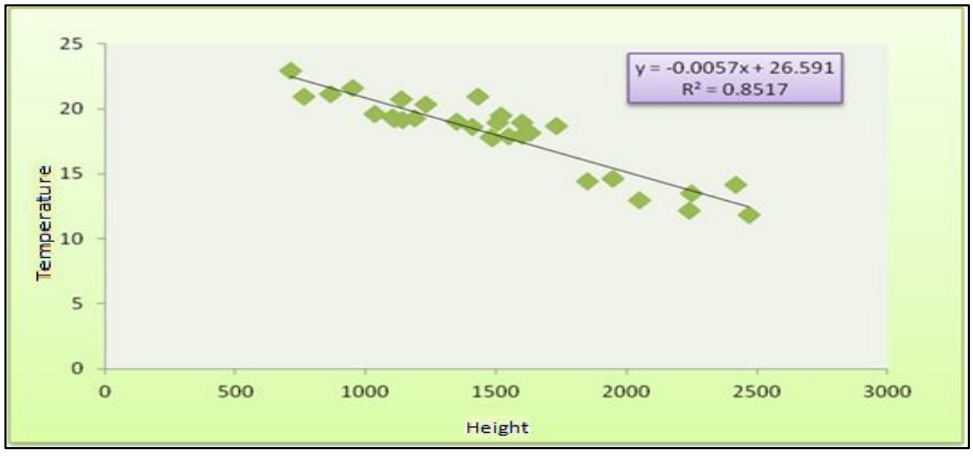

Figure 2: Relation between height and temperature in Yazd state

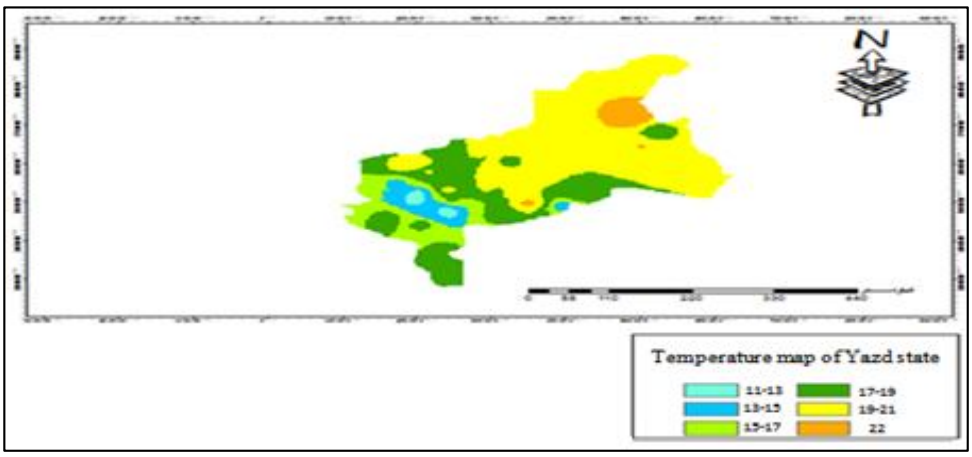

Figure 3: Temperature map of Yazd state

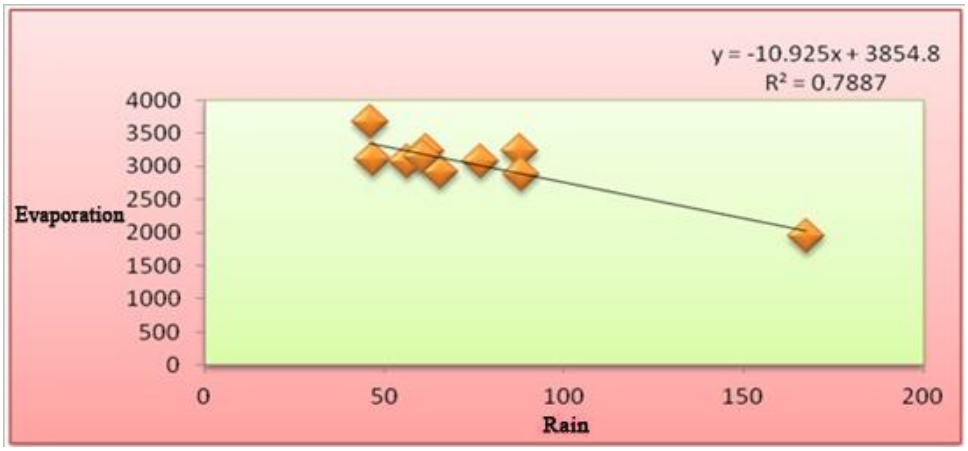

Figure 4: Relationship between rain and evaporation in Yazd state

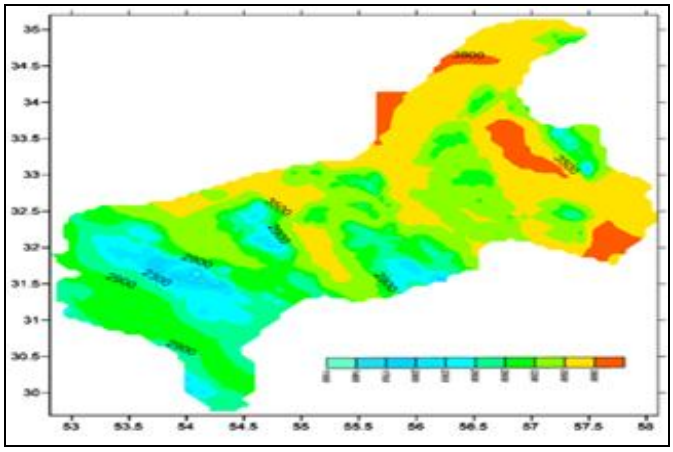

Figure 5: Evaporation map in Yazd state

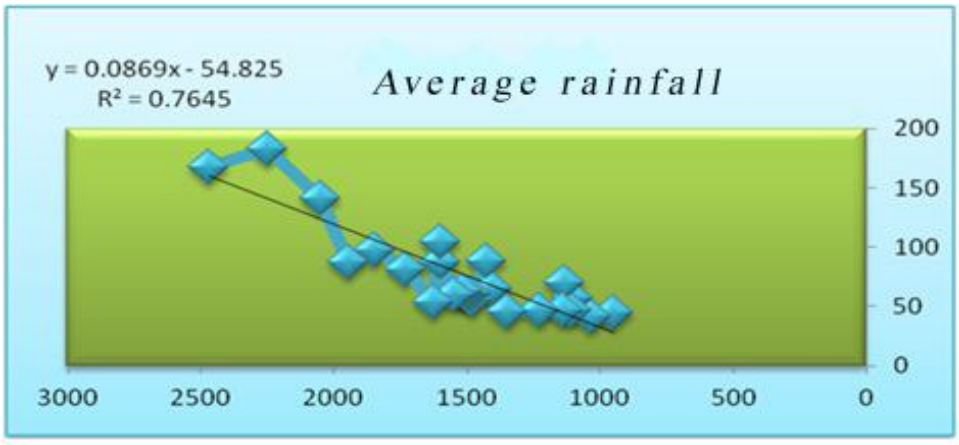

Figure 6: Rain and height relationship at the state of Yazd

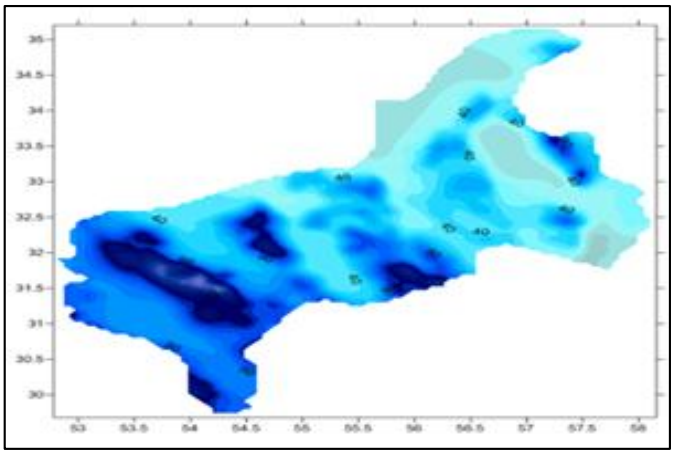

Figure 7: Rain map of Yazd state

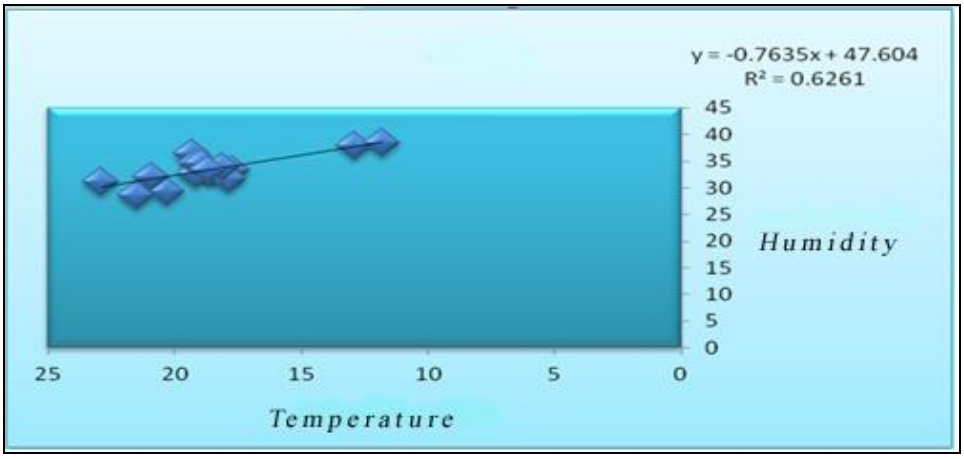

Figure 8: Temperature and humidity relationship in Yazd state

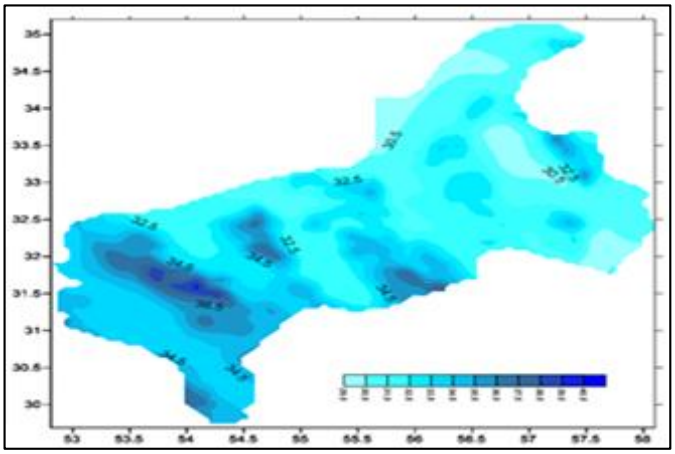

Figure 9: Humidity map of Yazd state

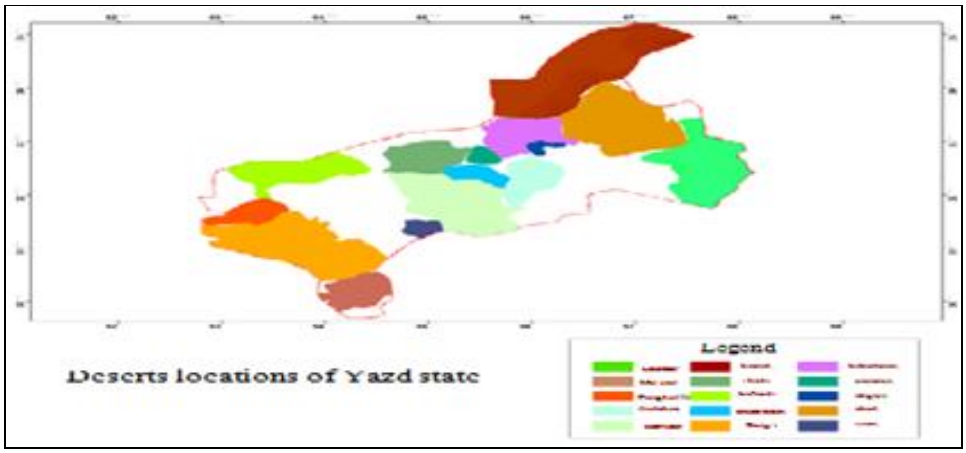

Figure 10: Deserts locations of Yazd state

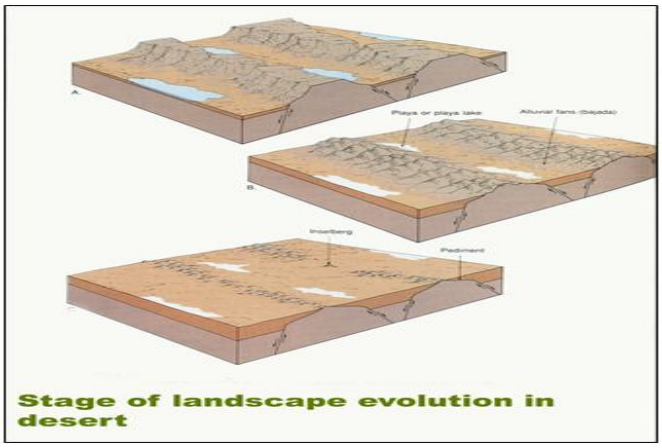

Figure 11: Development of GrabnDuring the ablation process

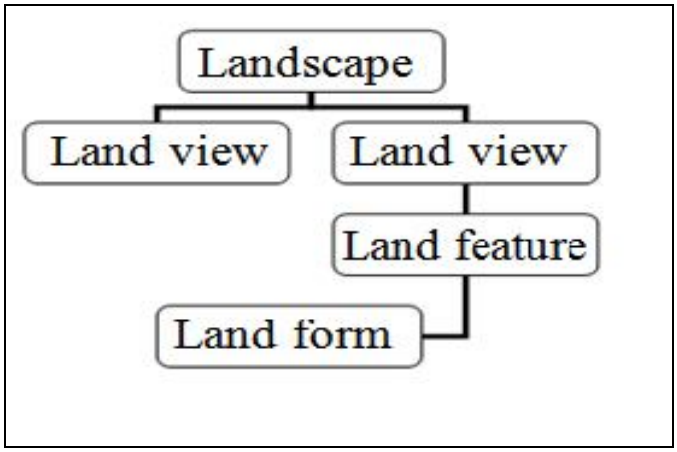

Figure 12: Formic units in geomorphology

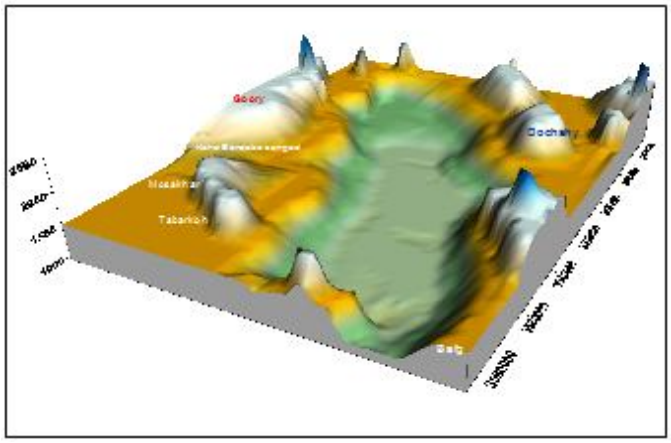

Figure 13: Abarkouh desert position and highlands around it

Figure 14: Salinization process in Abarkouh desert

Figure 15: Constructed dam by Regional Water at upstream of Abarkouh desert

Figure16: Planar surface areas of wet clay type with brackish water

Figure 17: Boated clay type in a plain surface

Figure 18: Salt polygons type created at the margins of rivers at the center of desert

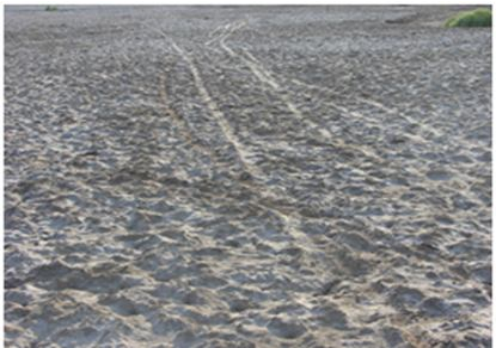

Figure 19: Clay- salt bloated lands type in Abarkouh desert

Figure 20: Surface salt types at lands in water

INSTRUCTION TO AUTHOR (S)

Manuscripts should be concisely written and conform to the following general requirements: Manuscripts should be type written in double-space in A4 sized sheets, only on one side, with a 2 cm margin on both sides. Research Papers should have more than 15 pages, Review Articles in the range of 15-30 pages and Short Communications up to 15 pages, inclusive of illustrations. Pages should be numbered consecutively, starting with the title page and the matter arranged in the following order: Title page, Abstract, Introduction, Materials and Methods, Results, Discussion or Results and Discussion, Acknowledgements, References, Illustrations (Tables and figures including chemistry schemes along with titles and legends) and figure and Table titles and legends. Abstract should start on a separate page and each table or figure should be on separate sheets. The titles "Abstract" and "Introduction" need not be mentioned. All other section titles should be in capital letters while subtitles in each section shall be in bold face lower case followed by a colon.

Title Page - Title page should contain title of the paper in bold face, title case (font size 14), names of the authors in normal face, upper case (font size 12) followed by the address(es) in normal face lower case. The author to whom all correspondence be addressed should be denoted by an asterisk mark. The title should be as short as possible and precisely indicate the nature of the work in the communication. Names of the authors should appear as initials followed by surnames for men and one given-name followed by surname for women. Full names may be given in some instances to avoid confusion. Names should not be prefixed or suffixed by titles or degrees. Names should be followed by the complete postal address or addresses with pin code numbers of the place(s), where the research work has been carried out. At the bottom left corner of the title page, please mention "*Address For correspondence" and provide a functional e-mail address. Address of the corresponding author to whom all correspondence may be sent should be given only if it is different from the address already given under authors' names. Trivial sub-titles such as 'Title', 'Author', 'Address' or 'Place of Investigation' shall not be included in the title page. Title page should be aligned centre except for "* Address For correspondence". Provide a running title or short title of not more than 50 characters.

Abstract - Should start on a new page after the title page and should be typed in single-space to distinguish it from the Introduction. Abstracts should briefly reflect all aspects of the study, as most databases list mainly abstracts. Short Communications as well as Review Articles should have an Abstract.

Key-words - Provide four to ten appropriate key words after abstract.

Introduction - Shall start immediately after the Abstract, as the next paragraph, but should be typed in double-space. The Introduction should lead the reader to the importance of the study; tie-up published literature with the aims of the study and clearly states the rationale behind the investigation.

Materials and Methods - Shall start as a continuation to introduction on the same page. All important materials used along with their source shall be mentioned. The main methods used shall be briefly described, citing references. Trivial details may be avoided. New methods or substantially modified methods may be described in sufficient detail. The statistical method and the level of significance chosen shall be clearly stated.

Results - All findings presented in tabular or graphical form shall be described in this section. The data should be statistically analyzed and the level of significance stated. Data that is not statistically significant need only to be mentioned in the text - no illustration is necessary. All Tables and figures must have a title or caption and a legend to make them self-explanatory. Results section shall start after materials and methods section on the same page.

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Discussion - This section should follow results, deal with the interpretation of results, convey how they help increase current understanding of the problem and should be logical. Unsupported hypothesis should be avoided. The Discussion should state the possibilities the results uncover, that need to be further explored. There is no need to include another title such as "Conclusions" at the end of Discussion. Results and discussion of results can also be combined under one section, Results and Discussion.

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Articles in Journals

1. Devi KV, Pai RS. Antiretrovirals: Need for an Effective Drug Delivery. Indian J Pharm Sci 2006;68:1-6.
   List the first six contributors followed by *et al*.
2. Volume with supplement: Shen HM, Zhang QF. Risk assessment of nickel carcinogenicity and occupational lung cancer. Environ Health Perspect 1994; 102 Suppl 1:275-82.
3. Issue with supplement: Payne DK, Sullivan MD, Massie MJ. Women's psychological reactions to breast cancer. Semin Oncol 1996;23(1, Suppl 2):89-97.

Books and other Monographs

4. Personal author(s): Ringsven MK, Bond D. Gerontology and leadership skills for nurses. 2nd ed. Albany (NY): Delmar Publishers; 1996.
5. Editor(s), compiler(s) as author: Norman IJ, Redfern SJ, editors. Mental health care for elderly people. New York: Churchill Livingstone; 1996.
6. Chapter in a book: Phillips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. Hypertension: pathophysiology, diagnosis, and management. 2nd ed. New York: Raven Press; 1995. p. 465-78.

Illustrations: Tables - Should be typed on separate sheets of paper and should not preferably contain any molecular structures. Only MS word table format should be used for preparing tables. Tables should show lines separating columns but not those separating rows except for the top row that shows column captions. Tables should be numbered consecutively in Arabic numerals and bear a brief title in capital letters normal face. Units of

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