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Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Cost of Transactions and its Impact on Re-Purchase Intention

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Received: 22 Mar 2015 Revised: 21 Apr 2015 Accepted: 11 May 2015

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ABSTRACT

The purpose of this research is to investigate the influence of cost transaction on repurchase intention. A total 384 questionnaires were distributed to Mellat Bank customers. The survey was distributed at Tehran city in Iran.14 items scale was taken in our questionnaire. Construct with five Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The proposed relationships have been tested by using structural equation modeling (SEM) via Smart PLS. The research results showed that there is positive and significant influencing between two hypotheses. In this research we haven't found any impact among the cost of ethical dangers and also re-purchase intention.

Key words: cost of transactions, cost of ethical dangers, cost of information access, cost access investment, repurchase intention.

INTRODUCTION

Marketing activities are mostly based on customer value. Perceived value in marketing is defined through assessing customers from the costs and gained advantages from buying of a product or service, in fact, the thing that a customer buys is not the service itself it is the consequence of using the service. In other words, the customer decides to purchase in order to fulfill his needs, and the quality of presenting process and the obtained consequence after use form most of the advantages and value of the service [1]. In fact, customers' perceived value can be an effective step in absorption of customers' satisfaction and absorption of the customers for a long-term. If we eliminate such factor, then the customers will not continue their cooperation with financial institutions and this factor will indicate that such institutions are not having appropriate position in the market. In fact, we can state that customers' perceived

value from electronic services is one of obstacles for leaving purchase intention process. On the other hand, the obstacles of change in customers' re-purchase intention are the factors that harden change of service providers for customers [2]. Even if the customers are dissatisfied from current service providers, they may keep on with them due to financial and social losses or the mental state. The obstacles of change refer to "consumer assessment from resources and required opportunities for doing the change, or similarly, the limitation that prevents the change" [3].

Identifying the change obstacles or in other words, the factors that increase re-purchase intention of customers, have been considered within recent marketing researches due to the significance in absorbing customers and the benefits of service providers.

However, the type and the nature of change obstacles are different in different industries. There is a common agreement among researchers that change obstacles are including costs of change (including financial and non-financial costs), relative investment (solidity of relation among customer and the employees of provider firm), and unattractive alternatives.

Since in this research the topic is e-services in banking industry, regarding to such kind of factors which we mentioned, they will have a little change in such topic. In this research, the costs have been changed to costs of information access, costs of ethical dangers, costs of investment on assets [6]. In fact, such cost is considered as vital factor in repletion of purchase process in e-services. If customers can pay lower cost for specific information access or specific services, certainly re-purchase process will happen with more probability [7] and cost of ethical dangers refers to the dangers that banks and financial institutions are facing during creation of electronically mouth to mouth promotions, since in such kind of services, customers may not be satisfied with the services they receive and a negative wave will be emerged for the bank which is effective on repurchase process.

On the other hand, the more the institutions invest on employees' knowledge; physical environment and … they will create the sense of satisfaction among customers that will increase the probability of re-purchase process.

During recent years Iran banking industry is facing with increasing competition. Regarding to emergence of private banks beside governmental banks and increase of competition among them, finding solutions for creation of long-term relation with customer and identification and reinforce the important and valuable activities for ascending satisfaction and loyalty of customers in one hand and identifying the obstacles and factors caused change and replacement of other bank by customer on the other hand, are getting more significant.

Until now, most of previous researches were in field of customers' re-purchase intention, about the loyalty of satisfied customers, but the researches indicate that in many cases even dissatisfied customers have stayed loyal to the product or service. Such loyalty is because of the obstacles that are in the way of change.

At the end, we face with this question: Are the costs of transaction effective on customers' re-purchase intention?

LITERATURE REVIEW

Cost of transactions

Cost of transactions in present research is divided into three cost of information search and access, cost of ethical dangers, and cost of investment on assets. In fact, lack of repetition of purchase process from organizations and institutions that the individual is the member of them, will cause the individuals to bear some costs that this issue to repeat purchase intention due to such costs. In fact, such costs in some of researches are called the costs of

unchanging or the same change obstacles. Costs of change are the costs that a customer shall bear in case of changing his activities and transactions from his current bank to a new one [8], and it can include both financial costs and non-financial costs; it means physical and mental costs [9,10], including attempt, time and energy (in order to search for information and comparing services quality, rate of bank profits, geographically closeness, the way of personnel contact and …) and more important than others, lack of confidence sense due to entering to an unfamiliar environment.

Therefore, increase in costs of change can lead to risk on customer and can make an obstacle on considering other banks, this issue can be considered as a kind of sustainable strategic advantage for bank [8].Therefore in summation, the previous literature implies the following hypothesis.

H1: Transaction costs effects on customers repurchase intention

Cost of access (searching) Information:

In this research, costs of access and search refer to the amount of consumer awareness about the activities of electronic and online markets or online bank services. In fact, in this research, the researcher is trying to indicate that within online services, access to such information will be quicker and time-saving and also in terms of financial costs it will increase customers' access to such information and reduction of such costs.

In fact, this is only one dimension of such costs, use of online services also causes increase of awareness about the brand itself. For instance, perception of customer from Mellat Bank brand and symbols and signs that the customers are contacting with during their use of its services also lead them to improve their awareness from Mellat bank brand. Therefore we proposed this hypothesis:

H2: cost of access to information effects on customers repurchases intention

Cost of moral dangers:

In this research, cost of ethical dangers refers to the subject of dangers within online industry due to high speed of information transfer. If financial institutions and online markets can create a kind of differentiation in providing their services, it will lead to increase of reliability and confidence and increase of mouth to mouth advertisement through virtual spaces. In fact, a degree of dangers the sellers and owners receive during electronic mouth to mouth advertisement, in their advertisement, if the individuals talk positive about organization and firm, such danger will be decreased.

H3: Cost of moral hazard effects on customers re purchase intention

Investment cost on assets:

The last part of costs that the researcher is studying it is the costs of investment on assets. In fact, this part refers to that the facilities and credits an individual gains during time in condition of using the facilities and services of online markets and institutions, in case of leaving receive of such services from institution and market and transferring services provider to another institutions, such credits will be lost. [13]. Therefore we proposed following hypothesis:

H4: cost of investment assets has an effect on customers repurchase intention.

Repurchase intention:

Nowadays organizations believe that only by repetition of customers' purchase are able to achieve long-term profit. Therefore, they are continually trying to facilitate re-purchase process. The purpose of re-purchase intention is the repetition of customer purchase from a specific brand after use from the same brand or customer belief to continue buying from a specific firm in future. Repurchase intention is a kind of behavior based upon recognition and feelingsand according to most of researchers have stated, repurchase intention is behavioral and customer loyalty index and basically it depends on times of customer purchase. Repurchase intention is an agent that impacts on future relation of customer with organization, firm profitability and their success. Totally, there are two viewpoints in connection with repurchase intention: Accidental view, definite view of repurchase intention. In accidental view, repurchase is happening completely accidentally, while in definite view, repurchase is happened based upon satisfactory from previous experiences and in better words, it is happening based upon loyalty to brand .

METHODOLOGY

Measurement instrument

Structural equation model with partial least squares approach was used to test research hypothesis. But before the start of interpreting of model, suitability of model in three parts of measuring, structural model and total model must be approved to trust to results driving from and in fact the validity and reliability of the model must be confirmed. For this purpose in section of model measuring, Cronbach's alpha index, combined reliability and convergent.To measure the effects of transaction cost in customer purchase intention in this research was used 14 items questionnaire developed by (Lee-Yu et al., 2014).14 items scale was taken into account for cost of access information(4 –items),moral hazard cost(3-items),cost of investment assets(4-items),repurchase intention(3-items). construct with a five likert scale ranging from1(strongly disagree)to 5(strongly agree). for internal reliability, chronbach's alpha coefficients and, combined reliability and convergent validity were calculated for all items of each construct. Results indicated that all the scales were considered to be reliable (chronbach's alphas). For determining reliability and validity of the questionnaire in this research used chronbach's alpha. chronbach's alpha for constructs are: cost of access information.733, cost of moral hazard.710, cost of investment assets.733, customer purchase intention.795. So the questionnaire reliability is acceptable. These results depicted in table1.

RESULTS

The proposed hypotheses were tested using structural equation modeling (SEM) via Smart PLS. After confirmation of measuring model, it is needed to point out to reliability of the structural model and two indexes of R^2 and Q^2 were used and presented in table 3. As it can be seen in table4, all factors loading are above .50 since the overall fit of the model is acceptable. The reliability of the construct can be assessed based on chronbach's Alpha, composite reliability(CR) and Average Variance Extracted(AVE). Also AVE of constructs is larger than .4 that indicates the reliability of the items α-chronbach supports the validity of items for each constructs. These results of fit index are depicted in table 2.

The analysis of SEM on the proposal model has generated results which are illustrated in figure2.

Data analysis

Descriptive statistics

First part in current study is descriptive statistics of participants in this research. The first question is related to the characteristics of the gender. From 384 participants of the study, 288 of them were men and 96 of them were women that show high volume of men in this study. Second question regarding Demographic of the study is related to the age, the most frequency was belonging to ages between 36-55 years old that made 284 participants of the research. Approximately (74%) were after ages of 25-35 with 16% of more frequency and ages above 55 years were about 6.5 % and age under25 years were 15 persons. The third part of the question is related to members of research samples related to their education level. The most frequency was related to bachelor degree and it was 40 %. After that, the most was for Master degree with 30 % and after that associated degree and lower with 20% and finally PhD with 10%.The last question of research sample was related to history of familiarity with Mellat bank. Here, most of people continually were in touch with 1-3 bank .In fact, about 78% of companies' members use bank's service more than one year.

Inferential statistics

After confirmation of measuring model, it is needed to point out to reliability of the structural model and two indexes of R^2 and Q^2 were used and presented in table 3.

Finally, it was pointed out to overall fit of the model that is used in models based on partial least squares of GOF that must be more than 3%. This index is calculated based on current model and indicates the suitability of overall fit of the model:

$$GOF=\sqrt{Communalities \times R^2} = 0.402$$

After confirmation of fitting, the model is presented in three level of Structural equation model that is created by Smart PLS and will investigate research's hypothesis.

According to the output of the software in partial squares approach it can be understand that

cost of access to information and the investment cost have an effect on customers' repurchase intention, because for confirmation and rejection of hypotheses it will refer to T-value which is observed in two figures and if t-value will be more than absolute value of 1.96 it can be inferred that considered hypotheses is confirmed .to present impact path coefficient was used that can be seen in figure 3. This coefficient is among zero and one that if it would be higher it refracted greater impact of independent variable on the dependent one. Summary of t-value and its impact is presented in Table4.

In continue, the researcher will investigate the main hypothesis of the research is presented in figure 2 and 3.

According to the output of the software it can be understand that cost of has an effect on customers' repurchase intention because t-value is about 13,932 which is higher than 1,96 and it can be inferred that mentioned relationship is approved and for confirmation of the amount of impact ,as it was observed in figure 5,the results show that 0.642 of changes of repurchase intention is supported by cost of transaction .Actually ,it can be claimed that cost of transaction has positive effect on customer repurchase intention.

CONCLUSION

Nowadays, surrounding environment is more complex that can have negative impact on the performance of companies and their competitive position. In fact, marketers are looking for providing better context for customers' satisfaction to keep their suitable position in market. Here, those companies and financial institute that can identify customer's needs better and try to meet their needs will perform more successful .the importance of intention of repurchasing among marketers and companies is the issue that cost of customers absorption will be higher by increase of competition among companies .This is while we keep absorbed customer in a way that we can keep organization's performance satisfied to use institute's service again .This factor can help us to decrease costs of institutes and obtaining more benefits. Nowadays, marketing researchers found that satisfaction is not an only effective factor in improving repurchasing and there are another identified factors that can improve this process .Here, one of these factors is cost of transactions. In fact, this type of costs can decrease customer's costs and can be an effective factor on customer's behavior. The researcher divided cost of transaction into three classes or parts of cost or access to information, cost of moral dangers and cost of investment of assets. Results of the study indicate that cost of access to information and also investment on assets are the effective factors on process of repetition or customer's repurchase intention .In fact, cost of access to information is an effective factor on improving customers mental image and perceived value .In another word, when customers find out that they may save their time and costs by receiving their services form Mellat bank and have easier access compared to other financial institute ,it will lead to the issue that customers of Mellat bank be more serious in their purchasing or its repetition from Mellat bank .Another process in current research that may lead to improvement of repurchasing is the customers that used Mellat bank's services for a long time ,can obtain more benefits among bank and employees for the reason of investment in this bank. If customers want to receive services from the other bank, this factor may lead to decrease of benefits which can be effective on repetition of purchasing process. Finally, it is recommended that managers and directors of Mellat Bank identify needs of their customers and try to provide some advantages that are not provided by the other banks for those customers that are using services of this back for the years to keep them.

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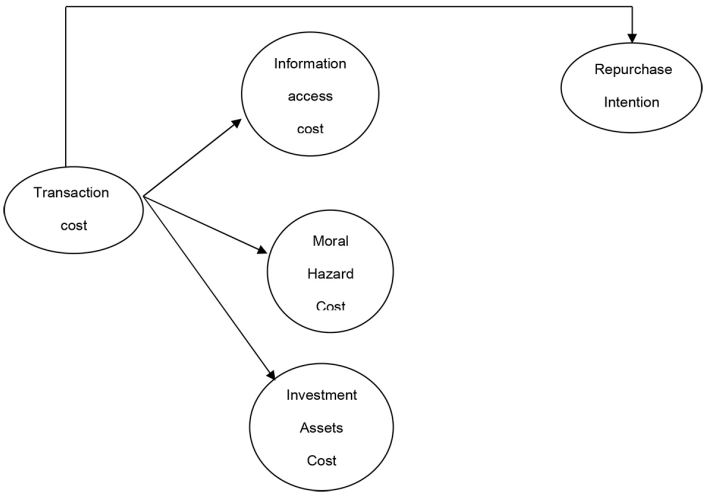

Figure 1. Conceptual model

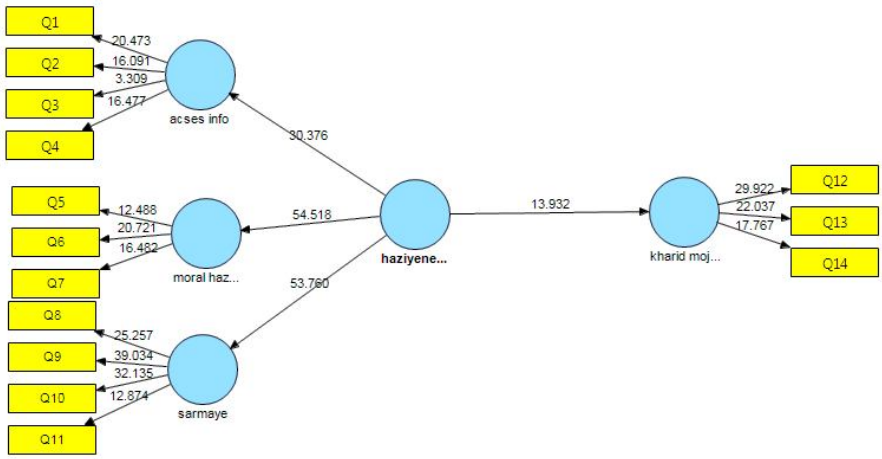

Figure2. Results T-Statistics for Hypotheses Model

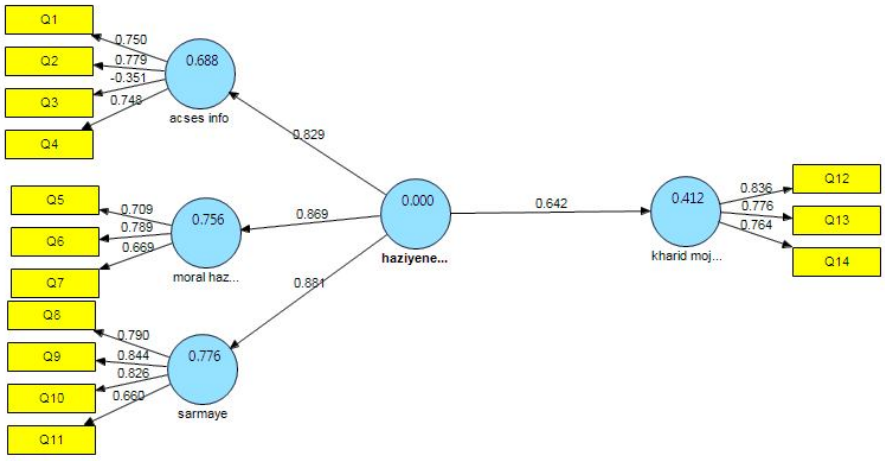

Figure3. Conceptual Model of The study with path coefficient

Table1. Chronbach's Alpha, convergent validity, Combined validity measures

Variables	Convergent validity	combined reliability	Chronbach's alpha
cost of access to information	0.557	0.833	0.733
Cost of moral hazard	0.766	0.766	0.710
cost of investment assets	0.61	0.835	0.733
repurchase intention	0.628	0.862	0.795

Table2. Reliability and overall measurement model

construct	Measurement items	Factor Loading	CR	AVE(> ./5)	Cronbach Alpha
Cost of access Information	Q1	809.	659.	456.	.718
	Q2	.774			
	Q3	.425			
	Q4	.715			
Cost of Moral hazard	Q5	701.	766.	766.	.710
	Q6	.798			
	Q7	.667			
Cost of investment assets	Q8	802.	835.	61.	.733
	Q9	.853			
	Q10	. 830			
	Q11	.630			
consumer purchase Intention	Q12	839.	862.	628.	.795
	Q13	.775			
	Q14	.762			

Table3. Results of Fit indices

Variable	R^2>0/19	Q^2> 0/15
repurchase intention	0.479	0.29

Table4. Summary of the results of hypotheses

Variable	path coefficient	t- Value	result
cost of access to information	β= 0/336	T =5.364	supported
Cost of moral hazard and repurchasing intention	β= 0/053	T=0/598	Not supported
cost of investment assets and repurchasing intention	β= 0/369	T =4.662	supported

Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Post-method Micro-Strategies Suggested for Iranian EFL Context

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Received: 12 Mar 2015 Revised: 20 Apr 2015 Accepted: 11 May 2015

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ABSTRACT

This study attempts to investigate the possibility of developing a context-oriented array of micro-strategies for Kumaravadivelu's macro-strategies. Kumaravadivelu (2003) proposed ten macro-strategies for EFL teaching, each is realized through some micro-strategies. However, some of the micro-strategies suggested in his framework are not applicable to Iranian context of EFL teaching. In this study, the researchers have designed three micro-strategies tailored for Iranian EFL learners. To do so, eight Iranian EFL teachers who were all volunteers participated in this study. After a ten-week treatment of the framework, they were requested to suggest micro-strategies for each macro-strategy. Then, the proposed micro-strategies were trimmed and modified by the researchers to well accommodate the contextual features of EFL teaching in Iran.

Key words: Macro-strategy, contextualization, micro-strategy, learning autonomy, cultural consciousness

INTRODUCTION

The history of language teaching has experienced different eras of changes. Sometimes they were drastic alterations such as the one observed in Direct Method after the attacked on Grammar Translation Method and sometimes slight orientation as was seen in Task-based Language Teaching after Communicative Language Teaching. However, the methods could survive for at least two centuries. People were exhausted by the change of methods for language learning. Each appeared to be the best one but after a while it was substituted by other method which was surmised

to be better than the previous ones. In 1990s scholars in the world of language teaching commenced to criticize the emergence and disappearance of methods and some proposed the Post-method era (Stern, 1992; Allwright, 1993; Kumaravadivelu, 1994). Kumaravadivelu proposed a framework consisting of ten macro-strategies each of which containing one or two micro-strategies (techniques) for practically implementing the suggested macro-strategies.

This study aims at familiarizing Iranian EFL teachers with the principles of Kumaravadivelu's framework and later to guide them to manipulate the macro-strategies in their teaching experience. In other words, the present study wishes to educate and train post-method language teachers as well as offering them three micro-strategies for five macro-strategies proposed by Kumaravadivelu (1994). Macrostrategy is a broad guideline based on which teachers can construct their location-specific, need-based microstrategies or classroom procedures. That is, macro-strategies are operationalized in the classroom through microstrategies.

Macro-strategy 1: Contextualizing Linguistic Input

Throughout the history, language was defined differently by different scholars. Language as text (Halliday, 1973), language as communication (Widdowson, 1978), language as context (Goodwin and Duranti, 1992), and language as discourse (McCarthy and Carter, 1994; Celce-Murcia and Olshtain, 2000) are major types of definitions of language. Interestingly all these definitions regard the notion of context as important. For instance, Goodwin and Duranti (1992) pointed out "It does not seem possible at the present time to give a single, precise, technical definition of context, and eventually we might have to accept that such a definition may not be possible" (p. 2).

There are four major types of contexts mentioned in language-related literature available in print or on line, all of which will be elaborated in the following section.

Linguistic Context

Linguistic context refers to the immediate linguistic environment that contains formal aspects of language required for the process of meaning-making. This includes pronouns, articles, conjunctions, ellipses, substitutions, and other features of the linguistic code. Such a linguistic environment belongs to the grammatical and lexical levels within a sentence or between sentences in a text. At the sentence level, the linguistic environment may contain adequate contextual clues for understanding the meaning of grammatical or lexical items and when it is between the sentences, linguistic context relates mainly to the notion of cohesion. It refers to relations of semantic meaning between sentences in a text. It occurs where the understanding of one element of the text is dependent on that of another. One cannot be decoded without the other.

Extralinguistic Context

Extralinguistic context refers to the immediate linguistic environment that contains prosodic signals such as stress and intonation. They can also include the relative loudness or duration of syllables, and changes in the pitch of a speaker's voice. They carry information beyond what is expressed through syntactic and semantic features of the language. In a conversation, one can easily understand what information has been or needs to be fore-grounded for emphasis or for attention.

Situational Context

Malinowski (cited in Kumaravadivelu, 2003) proposed that any linguistic analysis must take into account what he called the context of situation and the context of culture. These two are clearly interwoven. Malinowski argued that language is embedded within a context of situation and that the situation in which utterances are made cannot be

ignored. That is, words and utterances can have different meanings and functions in different contexts. Therefore, a true analysis and understanding of language communication is possible only if one goes beyond the linguistic and extralinguistic contexts in which it occurs and considers the situational context as well.

What Malinowski stated was later followed by others such as Austin (1962) and Hymes (1972). Austin (1962) proposed speech act theory in which he pointed out that we use language in order to perform speech acts such as requesting, ordering, complaining, and promising. Hymes (1972) identified and described eight factors for the situational context of a communicative event by using the acronym SPEAKING:

Setting: the place and time in which the communicative event takes place.
Participants: speakers and hearers and their role relationships.
Ends: the stated or unstated objectives the participants wish to accomplish.
Act sequence: the form, content, and sequence of utterances.
Key: the manner and tone (serious, sarcastic, etc.) of the utterances.
Instrumentalities: the channel (oral or written) and the code (formal or informal).
Norms: conventions of interaction and interpretation based on shared knowledge.
Genre: categories of communication such as lecture, report, essay, poem, etc.
Widdowson (1978, p. 29) argues that more than the linguistic and extralinguistic contexts, it is the situational context that makes an interactive exchange communicatively coherent.

Extrasituational Context

Extrasituational context deals with what is and what is not appropriate in a context. This communicative appropriateness depends on the social, cultural, political, or ideological contexts that shape meaning in a particular speech event. It depends largely on the norms of interpretation, which varies from culture to culture. Acquiring knowledge of how extrasituational factors contribute to the process of meaning-making implies acquiring knowledge of how language features interface with cultural norms.

To sum up, it should be realized that linguistic input to learners should be presented in units of text, or what we call discourse, so that learners can benefit from the interactive effect of various components and contexts. Therefore, words should be presented in sentences, and sentences should be practiced in meaningful contexts and not be taught as isolated, disconnected elements. If the sentences are isolated, then they will result in pragmatic dissonance, depriving learners of necessary contextual clues, thereby rendering the process of meaning-making harder.

In the beginning of communicative language teaching, attempts to contextualize linguistic input were directed more toward grammar-oriented, mechanical drills that were embedded within an artificially created text and context than toward fostering authentic communication in class. Teachers were advised to use three classes of drills: mechanical, meaningful, and communicative drills. Later, communicative language teaching attempted to incorporate some of the linguistic, extralinguistic, situational, and extrasituational features in learning and teaching. They included teaching through proficiency-oriented activities (Omaggio, 1986), interactive scenarios (Di Pietro, 1987), problem-solving tasks (Prabhu, 1987; Nunan, 1989), simulation games (Crookall and Oxford, 1990), or discourse activities (McCarthy and Carter, 1994; Riggenbach, 1999; Celce-Murcia and Olshtain, 2000). As it is obvious, earlier attempts to contextualize linguistic input started with grammar moving gradually toward discourse.

Now after the elaboration of what this macro-strategy states, some micro-strategies are introduced.

Microstrategy 1: Puzzling the learners

This micro-strategy is used to show how the words are meaningless without the context in which they have been used. To do so, the following steps should be followed:

Step 1. Teacher should list a number of words and ask the learners to tell the meanings of the words. Two notions are to be taken. Firstly, the words are better to be selected from the units the learners have studied throughout the term. Secondly, they should have more than one meaning. This is an easy job because most of English words have more than one meaning.

Step 2. Teacher should intentionally choose the sentences in which the words have different meanings from what the learners have uttered. This would teach them the fact that the words without context have no or other meanings.

Microstrategy 2: Word within context

The second micro-strategy represents best how to contextualize words and vocabulary through some steps:

Step 1. The teacher should highlight the new words of each unit and then search the linguistic context of every term on the Internet.

Step 2. The text is offered to the learners to read and find the new words of the unit they have covered within it. Then, the learners are requested to memorize the phrase or sentence in which the new words have appeared.

Step 3. The learners should write the sentences in their notebooks for their further references.

Microstrategy 3: Story completion

Listening skill suffers from inconsiderate attention in the process of language teaching in Iranian EFL context in spite of great demands in SLA literature. Two important issues should be clarified here: One is that teachers should ask themselves what they have done to improve listening skill of their own students except demanding them to listen to a recording and transcribing what they hear, and the next is what teachers usually do in classes is just examining students' listening ability rather than practicing their listening skill. These two reasons might be called the major factors why Iranian students' listening skill is weak or at least not very powerful despite many sources available around them. Contextualized listening tasks should demonstrate real life activities, in which learners are expected to encounter.

Step 1. Teacher provides herself with a variety of listening recordings including stories, recipes, anecdotes, and maps. They can easily be found on the Internet or just by visiting a nearby bookstore in your city.

Step 2. Then teacher allocates some time (5-10 minutes) each session for listening activities. For example, students need listen to some part of a story and continue the story in their own way. In case of anecdotes, they are asked to finish the story in a way to make everyone laughs. This type of task can best illustrate team work because every group may end the story or anecdote in their own choice.

Macro-strategy 2: Integrating Language Skills

In the past, skill separation was very common in different methods of language teaching. It was founded on a particular belief in language, language learning, and language teaching. For example, in Audiolingual method it was believed that language is basically aural-oral. That is, speech is primary and constitutes the basis of language. The formal properties of grammatical usage were emphasized more than the functional properties of communicative use. Given such an emphasis, it appeared reasonable to separate language skills. However, Widdowson (1998) asserted "We can talk of skills in respect to usage, but if we talk about language use, we need a different concept and perhaps a different term" (p. 325). Audio-Lingual Method also ordered a strict sequence of the skills: listening, speaking, reading, and writing. That is, they believed learners should not be allowed to attempt to speak before they learn to listen, or to write before they learn to read.

Today there is a strong belief for the integration of the skills. Both theoretical and experiential knowledge overwhelmingly point to the importance of integrating language skills. It is likely that the learning and use of any one skill can ignite both cognitive and communicative associations with each other.

The effect of listening activity on speaking skill was studied by different scholars and Bygate (1998, p. 34) found it "inevitable that the real time processing of listening activities, the exposure to language via reading and listening, and the attention to form-meaning relations in all skills can wash forward to help the development of speaking." Such a connection is true of writing as well, as observed by Rivers (1981, pp. 296–7) where she stated "Writing is not, then, a skill which can be learned in isolation."

Apart from the theoretical support of skill integration, the practice of skills in the classroom indicated the inseparability of skills. For example, the extroverts who like to speak a lot, the introverts who prefer to listen or read, and the analytically or visually oriented learners who like to see how words are written and sentences constructed. Definitely every teacher of language would approve of the fact that when one skill is worked on in the classroom, other skills would come to help better learning of that skill.

In performing a well-planned integrated activity, learners may do different things. For instance, they may try to understand the teacher's directions, seek clarifications, and take notes (listening, speaking, and writing); or they might engage in a decision-making process about how to use the collected information and proceed with the activity (listening, speaking, and reading); or the can carry out their plan of action (reading, writing, speaking, and listening).

The following are the suggested micro-strategies for integration of skills.

Micro-strategy 1: Tehran metropolis

As already mentioned, all four skills have the same importance in post-method language teaching. Furthermore, the skills are to be integrated in this era and the following is one which is designed to integrate reading and speaking or writing:

Step 1: Teacher selects a text written about air pollution in Tehran metropolis. This topic is a frequent written article in English dailies published in Iran. Therefore, the teacher would not have trouble finding text about it.

Step 2: Teacher would classify the sub-topic into three issues (sources, results, and solutions) of air pollution in Tehran and ask learners to discuss it. This is the time learners spend on speaking and listening skills while they are discussing the issue. It can also be a good time to practice their vocabulary knowledge if the teacher offered them the

new words for their discussion. If time allows or the teacher is interested, vocabulary practice can be included as well.

Step 3: Then, the text is offered to the learners to read it for two purposes: (a) for reading comprehension and (b) for comparing what they have stated with what has been written in the text.

Step 3: Finally for the purpose of integrating reading with writing, learners can be asked to either write the summary of the text or write their viewpoints regarding the writer's attitude in the text, whether they agree on what they have read or disagree on the ideas mentioned in the text.

Micro-strategy 2: Coming up with ideas

This micro-strategy deals with the integration of writing skill with reading and speaking skills while working on writing skill. Through the following skills, this integration is manifested:

Step 1: Suppose learners were taught how to write a composition of a letter. Now it is time to practice what they have learnt. Learners should be asked to read a text given by the teacher to get the idea of what they can write before they commence to write the task. These texts can best be obtained in newspapers, magazines, books or other periodicals. Undoubtedly if the learners are asked which part of the writing task is more difficult than other parts, they will say that part is the idea of what to write. In this way, that problem would not exist anymore.

Step 2: After reading the text, the learners are asked to write down the outlines of the most important issues of the text as the major ideas of the text. In this way they will notice what the main issues are and how they can be arranged in a piece of writing.

Step 3. Now learners start putting pen to paper and write their own piece of work based on the experience they have obtained through the integration of the reading with writing skill.

Step 4: Finally learners can exchange their pieces of work to be evaluated or completed by their peers. At this stage, writing is integrated into reading skill. It seems that integration of the skills looks like a recycling process beginning with one skill, integrating with other skills, and finally ending with the same skill the learners have stated the task.

Micro-strategy 3: Vocagrammar

The following steps are designed to illustrate how vocabulary can integrate with grammar learning:

Step 1. Teacher should list the new words of the unit which is going to be taught. Teacher asks the learners to look them up in dictionaries or surfing net to find the meanings within the phrases or sentences.

Step 2. The following session when learners enter the class, some of them are asked to read the sentences they have written in their notebooks. The teacher should write some of the definitions on the board and draws the attention of the learners to the structure in which the new words have appeared.

Step 3: Now it is time to analyze the structures in which the words have been used to decipher the patterns. Some patterns are familiar to learners and some may not. This can be decided by the teacher to work on just known patterns or both known and unknown patterns. In this way, vocabulary serves as a tool for learning or practicing grammar.

Macro-strategy 3: Promoting Learner Autonomy

The concept of autonomy, in its most basic form, represents a fundamental longing for freedom of thought and freedom of action in personal, economic, social, political, and other walks of life. Autonomy in educational realm is considered a worthy goal to achieve for philosophical as well as for psychological reasons. In philosophical point of view, one of the goals of general education has always been to create autonomous individuals who are willing and able to think independently and act responsibly, whereas in psychological foundation for learner autonomy different functions are expected. For example, in cognitive psychology, autonomy means integration of knowledge within a personal framework. In humanistic psychology, autonomy emphasizes the promotion of learners' self-esteem through personal ownership of learning, and in educational psychology, it provides a strong connection between autonomy and learner motivation (Broady and Kenning, 1996).

Scholars are divided into two groups writing on autonomy. The first group has a narrow view of autonomy, and the second group owns a broad view of learner autonomy. The narrow view of learner autonomy involves, simply, enabling learners to learn how to learn. This enabling process includes equipping them with the tools necessary to learn on their own, and training them to use appropriate strategies for realizing their learning objectives. Holec (1988, p. 3) defined learner autonomy as "the ability to take charge of one's own learning." By taking charge of one's own learning, he actually means to have and to hold the responsibility for determining learning objectives, defining contents and progressions, selecting methods and techniques to be used, monitoring the procedure of acquisition, and, finally, evaluating what has been acquired.

On the other hand, the narrow view of learner autonomy treats learning to learn a language as an end in itself, while the broad view treats learning to learn a language as a means to an end, the end being learning to liberate. In other words, the former stands for academic autonomy, and the latter for liberatory autonomy. Liberatory autonomy empowers learners to be critical thinkers in order to realize their human potential. Liberatory autonomy goes much further than academic autonomy by actively seeking to help learners recognize sociopolitical impediments placed in their paths to progress, and by providing them with the intellectual tools necessary to overcome them.

The degree of autonomy is another issue which is important to be considered. Nunan (1996, p. 195) considered the issue of the degree of autonomy accorded to the learner. At the initial stage of autonomy, the emphasis is simply on raising the learner's awareness of the reasons behind the teacher's choice of goals, tasks, and materials. At the intermediary stage, the emphasis is on allowing the learner to choose from a range of options given by the teacher. Finally, at the advanced stage, the emphasis is on learner determination of his goals, tasks, and materials.

According to the materials covered in this section, the following micro-strategies are suggested to be used in the Iranian context.

Micro-strategy 1: Autonomous learners

Sense of autonomy may have been felt by Iranian learners in academic levels of education, but it is not yet experienced in many language teaching centers. That's why it seems to be a little bit difficult to employ it in language learning context in Iran. The steps for converting a dependent learner to an independent one are mentioned below:

Step 1. At the very beginning of the term, teacher has a tough job to fulfill. The teacher attempts to teach some fundamental issues to construct independence among learners. Teaching phonetic alphabets, different types of dictionaries, how to use dictionaries to find meaning, what an encyclopedia is, how it is used and for which purpose, and so on and so forth should be taught to the learners.

Step 2: Now it is time to practice what they have learnt. The teacher can write some words on the board and ask students to write the phonemic transcriptions of those words. Something which should always be remembered is the notion of repetition in the process of language learning. Here, the learners should practice how to read and write phonemic transcriptions of the words. In this way, step-by-step their pronunciation would improve and their independence regarding pronouncing is constructed as well.

Step 3: The teacher can also ask learners to find some information about the proper nouns seen in their text books. They have already been told that any information regarding proper nouns can be searched on the Internet Wikipedia or encyclopedias.

Step 3. This process should be repeated and repeated until a time that the learners would be independent of the teacher for the learning of pronunciation, vocabulary, and even grammar.

Micro-strategy 2: Fooling yourself

It is recommended that teachers should sometimes pretend not to know the meaning of a word, or the exact stress shift of a word, or one grammatical point, or a proverb, or an idiom. That is the best time to ask the learners to do mini-projects and search around to find the answer to their own questions. Team work and project-work can both help learners to be independent of not only teachers but also other people. Through the following steps learners can develop their autonomy:

Step 1: The teacher should divide the class into several teams or groups. For example, three or four learners can build up each team. Remember each group should have a leader or head who is more knowledgeable than other members of the group.

Step 2: The teacher should give team work or mini projects to each group to do every week or even every session. For example, the equivalent of the Persian proverb for an English proverb, or the differences between two or more words such as trip, journey, exploration, excursion, and travel, or a grammatical point can be asked to be searched and found out.

Step 3: The following session, the learners would come up with their answers. The teacher can ask the head of the group to read what they have found for the answers and explanations of their research. If this task is repeated, the learners will learn to search for any knowledge they are interested to know and stop waiting for others to provide them the answers to their questions.

Micro-strategy 3: Learners as strategy users

The teacher can teach learners different strategies for learning the foreign language. These learning strategies can be best taught in the classrooms for better foreign language learning through the following steps:

Step 1: The teachers should first be familiar with different learning strategies themselves. The learning strategies are introduced in second and foreign language textbooks. Then, the teacher would introduce some learning strategies to learners and ask them to use them in their process of learning. Strategies such as repetition, interaction with others, learning in context, cooperation with peers, using images, awareness of the learners, and making examples are the strategies which can be easily taught to the learners to be a strategy user in their foreign language learning.

Step 2: After familiarizing the learners to learning strategies, the teacher should act as a model. That is, he/she uses special strategy for specific learning. For example, repetition and using images for learning vocabulary, interaction with others and cooperation with peers for speaking, writing, and listening skills, awareness to the language and raising the consciousness for grammar learning, are some strategies which can be worked out in the classroom context.

Step 3: Next, the teacher would give enough time to learners to use the strategies with sufficient scaffolding. This support should not continue forever. As soon as the teacher notices the learners can stand on their own two feet, they should stop scaffolding.

Step 4: Finally, the teacher should monitor the learners' use of learning strategies. If they find any faults in the learners' application of the learning strategy, they are to correct them.

As aforementioned, the strategy users of foreign language learners can be more successful in their learning and it can also make them more autonomous than non-strategy users.

Macro-strategy 4: Ensuring Social Relevance

There are factors such as class, gender, race, ethnicity, nationality, religion, and language which play a role in shaping classroom discourse as well within a social context (Kumaravadivelu, 1999). In order to make L2 learning and teaching socially relevant one has to recognize that the broader social, political, historical, and economic conditions that affect the lives of learners and teachers also affect classroom aims and activities.

In order to study social relevance, first the type of language which is used in society should be studied to get the essence of the discussion. One type of language is standard language. The term standard refers to a prestige variety of a language and is defined as "the variety of a language which has the highest status in a community or nation and which is usually based on the speech and writing of educated native speakers of the language" (Longman Dictionary of Applied Linguistics, 1985, p. 271). A variety does not become "standard" just because educated native speakers speak it; a variety is considered "standard" only because it is spoken by those who control the social, political, and cultural power centers within a nation (Kumaravadivelu, 2003). Widdowson (1994) believed "the custodians of standard English are self-elected members of a rather exclusive club" (p. 377). However, others might define standard English differently. Lowenberg (2000) asserted "the standard model of a variety of English—native or non-native— is "the linguistic forms of that variety that are normally used in formal speaking and writing by speakers who have received the highest level of education available in that variety" (pp. 69-70). On the contrary, Widdowson (1994) argued that "the very fact that English is an international language means that no nation can have custody over it. To grant such custody of the language is necessarily to arrest its development and so undermine its international status" (p. 384).

Here are some micro-strategies developed to ensure social relevance for Iranian EFL teachers.

Micro-strategy 1: Socially ethical?

The relationship between language and society cannot be ignored in the process of foreign language learning. Therefore, while learning a new language, one should observe the social relevance of L2 and the learning context. On the other hand, one of the problems of the textbooks used for language learning in Iranian context is irrelevancy of the social issues presented in these textbooks. Moreover, there are many social matters Iranian learners are interested in, but are not presented in the textbooks. However, how social relevance is observed, is discussed in the following micro-strategies.

Step 1: The teacher selects an article about a social issue on the Internet or from a printed newspaper. The article or text should be offered to the learners to read and comprehend the text. Because the detailed comprehension is not the main issue here, the time should be allotted for general idea of the passage.

Step 2: Next, the teacher asks the learners to pinpoint the social issue which has been covered in the text.

Step 3: Then, the class should be divided into two groups; one for and the other against. The for group should support the social issue which is in the text, and the against group should disagree on the issue.

Step 4: In the end, learners can compare and contrast the social issue with the Iranian society. The discussion can refer to acceptability, feasibility, and availability of the issue in Iranian context.

Micro-strategy 2: Social etiquettes between L1 & L2

Social etiquettes might be different in different languages and societies. One way of observing social relevance is through highlighting social etiquettes between two languages in the steps suggested in the following lines:

Step 1: The teacher selects a number of behaviors which could be acceptable in one society (English or American one) and unacceptable in the Iranian society. The behaviors can range from social manners such as eating habits, greeting, inviting, getting together, shaking hands, to personal manners such as reading books, exercising, and driving the car. For example, American and English people start talking while having their meals whereas this action is considered impoliteness in Iranian society and culture. Being quite is regarded a social etiquette in Iran and is usually appreciated by traditional families.

Step 2: Then, the teacher focuses on each social activity and asks the learners whether they appreciate that activity or depreciate it.

Step 3: Next, the teacher would mention more social activities which are common in foreign language culture and the learners should be familiar with in case they should take a trip abroad or intend to live in those countries the foreign language is spoken. It is recommended that the teacher should ensure the social relevance and not talk about the issues which are counter-culture of Iranian social etiquettes.

Micro-strategy 3: Old sayings

Proverbs and slang words are considered culture-bound in different languages all over the world. However, similarities can be observed among the languages despite with all their differences.

Step 1. Teacher introduces students some sources from which proverbs and slang words can be found and learned. The sources range from proverbs and slang words dictionaries to the Internet and cyberspace.

Step 2. Students are requested to compare and contrast English proverbs and slang words with those in Persian and list them into two categories; one which contains the identical ones and the other those which are different. The proverbs and slang words which do not contract Iranian social standards and etiquettes can be worked out and the ones which are socially, culturally, politically, and religiously inappropriate can be ignored and left unpracticed.

Macro-strategy 5: Raising Cultural Consciousness

The definition of culture and what it refers to is a controversial issue. It brings to mind different images to different people. In its broadest sense, it includes a wide variety of constructs such as the mental habits, personal prejudices, moral values, social customs, artistic achievements, and aesthetic preferences of particular societies. Anthropologists distinguish between Culture with a capital C and culture with a small c. The former is a relatively societal construct referring to the general view of culture as creative endeavors such as theater, music, literature, and art. The latter is a relatively personal construct referring to the patterns of behavior, values, and beliefs that guide the everyday life of an individual or a group of individuals within a cultural community.

In the past the cultural orientation that informed L2 learning and teaching was confined mostly to Culture with a big C. After World War II, when language communication became the primary goal of language learning and teaching, learners and teachers started emphasizing the importance of everyday aspects of cultural practices, that is, culture with a small c. Stern (1992) believed that culture teaching has three components: a cognitive component, an affective component, and a behavioral component.

The cognitive component relates to various forms of knowledge—geographical knowledge, knowledge about the contributions of the target culture to world civilization, and knowledge about differences in the way of life as well as an understanding of values and attitudes in the L2 community. The affective component relates to L2 learners' curiosity about and empathy for the target culture. The behavioral component relates to learners' ability to interpret culturally relevant behavior, and to conduct themselves in culturally appropriate ways. Stern (1992) remarked "One of the most important aims of culture teaching is to help the learner gain an understanding of the native speaker's perspective" (p. 216). To do so, Robinson (1991) developed a theory of second culture acquisition as the integration of home and target culture in a synthesis she referred to as the Color Purple. Her Color Purple is a productive, cognitive, perceptual, and affective space that results from meaningful cross-cultural contact. It is created when one becomes aware of one's own cultural lens (i.e., blue) and when one recognizes that a person from another culture has a different lens (i.e., red). Neither person can escape his or her own cultural lens, but each can choose to overlap lenses (i.e., purple) in order to understand better the other's perspectives and arrive at shared meaning.

Kramsch (1993) proposed a third culture in the L2 classroom and defined it as a conceptual space that recognizes the L2 classroom as the site of intersection of multiple worlds of discourse. She urged teachers to encourage learners to create this third culture while, at the same time, not allowing either the home culture or the target culture to hold them hostage to its particular values and beliefs. Kramsch (1993) believed that it is the responsibility of L2 learners "to define for themselves what this 'third place' that they have engaged in seeking will look like, whether they are conscious of it or not.

Let's look at the issue of cultural awareness from another angle which was scrutinized by Paige (cited in Cohen, 2003). He postulated dimensions of cultural learning model, in which five categories were suggested. Culture learning, accordingly, is fallen into one of the following categories:

The self as culture: this aspect of culture learning emphasizes the fact that the ability to ask and answer questions according to our own culture facilitates the process of making connections across cultures.

The elements of culture: The beliefs, values, customs, products and the communication styles of a given culture or society (Cohen et al. 2003).

Intercultural phenomenon: It includes culture shock, cultural adjustment and adaptation, and the fact that a certain phenomenon can be interpreted differently in different cultures.

Particular cultures: It asserts that specific cultural communities need particular elements such as history, geography, and political systems, and above all, particular characteristics of a society (Cohen et al. 2003).

Acquiring strategies for culture learning: This dimension is considered the most valuable of all for the purpose of use in post-method language teaching. It deals with specific strategies for becoming more culturally competent in second or foreign language context.

Accordingly, three Micro-strategies were developed and elaborated in details in the following paragraphs. It is once more worthy to reiterate that these suggested micro-strategies were constructed for Iranian EFL context.

Micro-strategy 1: cultural awareness

To raise cultural consciousness among Iranian EFL learners a number of steps should be taken:

Step 1. Teachers should collect some books, movie clips, television shows, or pieces of music, newspaper and magazines in which Iranian culture is best manifested. Be cautious that culture as well as language is the best indicator of a nation's prestige. Therefore, pleasant and invaluable cultural practices are recommended for scrutiny and study in classrooms.

Step 2. Students can describe the behaviors in the materials they watched, saw, or heard which were from their own culture. This is deliberately done to attract their attention to cultural and social practices which is considered the departure line to destination ending to target culture.

Step 3. Now it is time to compare and contrast their culture with the EFL culture, besides their social practices. Students are required to discuss the differences and similarities between their social practices, and the culture they are observing in materials provided by the teacher. Multiple question might be arisen to students' mind to ask their peers as well as teacher regarding cultural issues presented to them. Questions attributed to the way people greet each other, how they get dressed, what and how they eat, how they behave toward traffic rules, what gestures they make coming across different life conditions, and what the polite way is when encountering various situations, are some of them which could be posed by the students concerning cultural issues.

Step 4. The questions mentioned above can lay the foundation for further discussions in class. Teacher can monitor and tailor the directions for the subject in question. That is, teacher should be conscious to observe students not to deviate from social and cultural issues in their debate. For example, the fact that in Iranian culture, offering something to somebody should occasionally be reiterated more than once to be accepted, might be regarded as unpleasant or even insulting in English or American culture. It is highly recommended that teacher not be judgmental to foreign cultural practices.

Micro-strategy 2: Culture journals

A journal is a notebook in which students write about experiences both in and out of classes as learning activities (Richards et al. 1992). It can also be a way for teachers and students to communicate different issues and share their views with peers in classes.

Step 1. Again the departure line is students' own cultural practices. Students should be asked to write on their cultural learning experiences, and on the advantages and disadvantages of foreign cultural behaviors. As a result, students can be judgmental regarding social and cultural practices of foreigners contrasted to their own practices.

Step 2. Teacher requests her students to have their journal with themselves and gives them some time to reflect on cultural practices they have observed and written in their journals. Throughout the class sessions students foster and invigorate their cultural awareness. The journals can, little by little, give identity to students' reflection. Furthermore, the journals can be a recording of thoughts, feelings, traditions, cultural behaviors, and subsequently, cause students to become interculturally competent. This is what most EFL teachers suffer in Iranian EFL context (based on the personal observation of writers of this paper).

Micro-strategy 3: Web quest

By the widespread Internet practices among Iranians, a web quest is a decent way to promote social and cultural awareness in EFL context. Teachers can best benefit from the cyberspace to aware their students to cultural issues and practices.

Step 1. Teacher should determine the cultural practice she would like her students to explore. These practices can include food and cuisine, music, traditions, clothing and costumes, and other cultural behaviors. This is not just simply for gathering information about foreign cultures, but for the rationale beyond what they do as cultural practices. For instance, teacher can ask students to find everything regarding Halloween as a national day in many foreign countries and request them to compare it with Iranian Ghashgh Zani (a tradition performed by Iranians of last generations).

Step 2. Now teacher can direct students to design their own questions regarding cultural issues. The questions can refer to the dishes frequently served in the UK or the United States, the typical school hours, hospital visits when one relative or friend is there, and even how a marriage ceremony takes place.

Step 3. Teacher should have students work in pairs and small group to improve the sense of team work among them.

Step 4. Students are expected to present their findings to other groups and consequently make a list of cultural practices which are similar or dissimilar to Iranian culture.

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Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

The Effect of Magnetic Field on the Germination, Growth Rate and Peroxidase Activity in Tehran Pine Tree Species

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Received: 18 Mar 2015 Revised: 20 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

In this study the effects of magnetic fields 4 and 8 MilliTesla on changes in peroxidase activity; the pine seed germination and shoot growth of roots and shoots of Tehran were studied. The method was that the seeds in sterile containers of wet sand to 5 a total of 20 treatments with 4 replicates within our culture. then the culture dishes at intervals of 20 days 5 and 10 minutes at the end of the magnetic field determines We counted the number of buds, the growth of root and shoot, the ruler of was used then by extraction enzyme extracted and 420 nm spectrophotometer UV few studies done and peroxides activity per unit time was measured by the length of root and shoot in cm, number of buds per container and an average number peroxides enzyme activity of each sample was recorded and Duncan and LSD statistical at the level of 0.05% was evaluated, the results in all parameters except in the case of significant length tests at level 99 with the control group.

Keywords; MilliTesla , Pine, the germination, *Peroxidase* activity.

INTRODUCTION

Humans, animals and plants due to the use of electrical energy that originate from industrial progress and technology, are influenced by an electromagnetic field. Living organisms are different types of magnetic field effects are the effect at the cellular level occurs. Electricity, magnetism, monochromatic light and sound can affect the growth of plants. 50 years of research in the field of bio- magnetic and its effects on living organs in the United States, Russia, Japan, Britain and France began. The various aspects of the effects of magnetic field on seed germination of plants is still not clear. Therefore assumptions about affecting the germination and growth of the magnetic field strength that can be used as a non-invasive and non-destructive growth of plants used.

Plants are naturally influenced by the Earth's magnetic field and the electrical field between the Earth and the clouds are (Kiatgamjorn, 2002, 2002). A possible hypothesis to explain the positive effect by the magnetic field can be paramagnetic properties of atoms in the chloroplasts of plant cells contain pigment.Studies have shown that the electromagnetic field of plant meristem cells of normal cell metabolism and the cell division affect (Belyavskaya et al 1992) and increased synthesis of peroxide in some cells (Dix, 1993) and the stimulation of metabolism mitosis).8002The plant is meristematic cells Celik et al, 2008)Magnetic and electrical treatments by increasing the activity of proteins and enzymes stimulate biochemical processes, the Moon Suk tomato seed germination percentage of the seeds treated with magnetic and electric field directly observed short-term (Moon, 2000).

The tests increased water absorption and germination of lettuce seed at MilliTesla magnetic field of 1 to 10 mg were observed. That it may be changes in the levels of intracellular concentration of calcium and potassium ions across the cell membrane to the cell osmotic pressure and tissue to absorb change (Garcia and Arza ,2001)If properly applied magnetic field range, high stimulatory effect on cell proliferation and growth of plants and fungi have this feature for industrial, pharmaceutical and agricultural use (Nagy, 2005).Increases germination and root length bean seeds treated with magnetic fields in different concentrations of calcium chloride (concentration of 1.0 to 10 mM) observed. He said that the application of the magnetic field may affect the flow of calcium (sakhnini, 2007).

During the trial, the effect of magnetic field on chlorophyll, carotenoids and biochemical changes in nucleic acidsCorn seeds were studied, the results showed that the magnetic field has had a significant impact in the early stages of development, including the impact of the increase in mass of fresh leaves, leaf Dye, the mean nucleic acid and increase the average length of the plant, but the longer the the deterrent effect of the magnetic field in the vicinity of the above mentioned traits (Racuciu et al2006 - 2008).

Photochemical studies have shown that stem cells exposed to a weak magnetic field to control stem cells, saturation of calcium in all its organelles and cytoplasm show. The magnetic field can cause the release of free radicals and stress in the plants, and while in some processes calcium ions help plant growth and react to stress, a study on the growth of palm seedlings Find the variable magnetic field stimulatory effect of low doses and high doses had a deterrent effect ,(Dhawi et al.2009).

The short-term effects of the magnetic field on the roots of wheat seeds were investigated. In this research, wheat seeds under the influence of a magnetic field of 15 m T 50 Hz for 15 and 30 seconds, and in the fourth and eighth day, the rate of germination, root weight and height were measured, as well as chlorophyll content and in addition, the contents of chlorophyll and the height of the buds with increasing duration of exposure, the greater the (Muszynski, S.at al, 2009).The magnetic fields on the seeds that are non-standard conditions have affected and their quality improves (Hamilton-Reeves et al., 2010).The influence of magnetic field on the changes in peroxidase activity and seed germination and shoot growth and stem pine tree species in Tehran MilliTesla magnetic fields 4 and 8 were studied.

MATERIALS AND METHODS

Materials

Magnetic fields, pine seeds Tehran, the centrifuge, spectrophotometer, autoclave, ph meters, scales, test tubes, Sample, tuberculosis glass cube, sand, sterile, graduated cylinders, Parafilm, ruler and mortar and Chinese plants.

Methods

A) Planting seeds of pine

We then counted 100 of Tehran pine seeds in each container on wet sand Pashym Then the seeds to a height of 2 cm pour the mixture of sand and water. The mixture of sand pine seeds sterile medium we will be wet with distilled water.8 MT in 5 minutes and 4 within 10 minutes to 8 MT magnetic field, which is a total of 20 dishes.

B) Tillering growth stages

At the end of counting the number of green shoots, root and shoot growth rate measured by the ruler and the data were entered in the system software excel.

C) The extraction

To extract the approximately 4 grams of samples each of 20 containers with a mortar inside the plant of Chinese wisdom and the balance weight and the ratio of 1 to 3 with a solution of extraction mixture made into test tube poured pipes with Para film package them for 24 hours at 4 ° C were placed in the refrigerator. The samples were centrifuged at 3000 rpm for 20 minutes and extracted the enzyme and enzyme tests until the beginning of the clear separation and Mykrvtyvp on hold at 4 ° C, respectively. (Korori, 1989).

D) Quantitative analysis of enzyme activity Prksydaz

In a small study Prksydaz using the spectrophotometer and 1963 Ornstein was conducted according to a small study by spectrophotometer UV (420 nm) was performed with a peroxidase enzyme activity was measured in units of time (Korori, 1989).Ingredients and a condition of this phase of work is as follows:

The phosphate buffer, Pyrvgalvl and mix hydrogen peroxide, then 20 ml enzyme extract is added to the collection. And the absorbance at 420 nm for five minutes at intervals of one minute is measured and the average is calculated. The agenda of the chemicals that were used as follows:
The data obtained from this phase-in period of one minute numbers in the read-in into the system we excel

E) Analysis of the data

Then figure out for each treatment for each of the four factors discussed above were drawn in excel and all data in spss statistical software by Lsd test and Duncan were studied.

RESULTS

Calculation of data from software Excel:The data of the number of buds per container and pine and alder seeds of root and stem length by ruler and the readings on the enzymatic activity of each sample in the spectrophotometer and mean all of these factors have been calculated and the graph was drawn.1 to 4 charts the effects of exposure to magnetic fields during consideration of this study represent.Calculate the amount of significant factors LSD using software:Then all the data in the statistical software SPSS 19 by LSD test the level of 0.05% was investigated, which is significant in all four factors germination, root length and stem length in cm, the enzyme activity was calculated as the results are as follows. Table 1 LSD test for germination, a root length and pine seed enzymatic activity was significant at the 99% level for the length test was insignificant.Calculate the amount of significant factors using

software Duncan SPSS:The test to show a significant difference between treatments Duncan test Spss 19 software was used in the level of 0.05 percent, which is significant in all four factors germination, root length and stem length in cm and enzyme activity the test given in tables and histograms of color is also shown below. It should be noted that the numbers of the same color in each column statistically according to Duncan no significant difference in the level of five percent.According to Duncan for the percent germination of pine 0.05% of all treatments were significant treatment differences Figure 5.According to Duncan for stem length (cm) of pine treatments 0.05% of all treatments, there was no significant difference.According to Duncan for root length (cm) of pine treatments 0.05% of all treatments were significant treatment differences.According to Duncan test for enzyme activity in Pine treatments among 8 MilliTesla treatments and control with 4 MilliTesla was a significant difference in the level of 0.05%.

CONCLUSION

It seems that the magnetic field affects the content of a living cell. Leaves According to Duncan for the percent germination of pine 0.05% of all treatments were significant treatment differences. In another study it was found that the magnetic field affects the surface tension of water and increases water absorption in seeds and the seeds are swollen in less time than the control sample (Yoshimas. 2001). According to Duncan growing pine shoot in treatment between treatments was not statistically significant 0.05 percent, but the growth of pine root treatments 0.05% of all treatments were significant treatment differences.

In another experiment, sunflower seeds were treated with the magnetic field during the shoot 6 to 41% and root length increased from 16 to 80 per cent (Vashisth et al, 2010) .Another study electromagnetic field increases the rooting of grape old (Dardeniz et al, 2006).According to Duncan test for enzyme activity among pine treatments 8 MilliTesla ,control , 4 MilliTesla treatment was a significant difference in the level of 0.05%. Moreover, the treatment with treatments in 8 for 5 min with 4 MilliTesla for 5 and 10 min is not significant. Positive effects of the magnetic field in the biosynthesis of proteins, cell proliferation, biochemical activity, breathing rate, activity of enzymes, nucleic acid and the amount of growth showed (Cakmak et al.,2010) .

It is likely that the magnetic field on the enzyme activity and protein compounds affect and alter the shape of the protein. It seems that the effect of the change in the sequence of nucleic acids and proteins are the building codes are created (Brockchaston, 1999 and Noriyuki.1999).Because the mechanism of action of a magnetic field on the characteristics of the plant is still not well known, so their reaction to the severity, time of exposure, depending on species and seed, and given that most of the factors other differences with the control treatment different magnetic media such as transplanting boxes, vases and even block planting in the greenhouse, the sensitivity and response of different species; and the intensity of the magnetic field for each plant will be identified and further investigation of the instigators or Deterrence magnetic field in the long term and at a later stage of growth compared to the germination investigated.

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Table 1: The amount of material in the spectrophotometry

Name	Sample	Control
Phosphate buffer	320ml	420ml
Hydrogen peroxide	160ml	160ml
pyrogallol	320ml	320ml
Distilled water	2180ml	2100ml
Sample solution	20ml	-

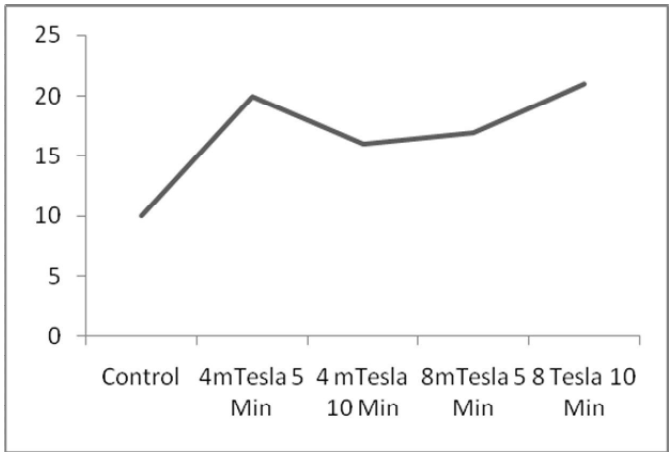

Figure 1. The average germination of pine treatments

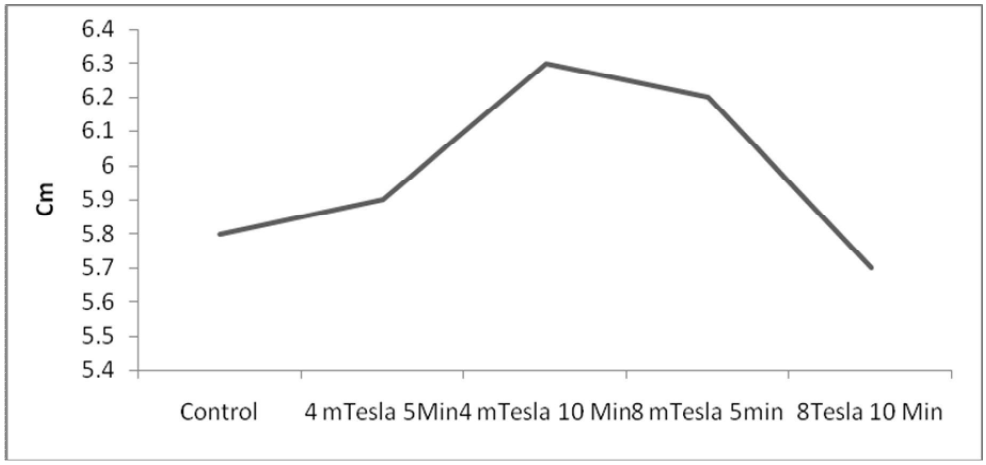

Figure 2.Average length of pine seeds cm

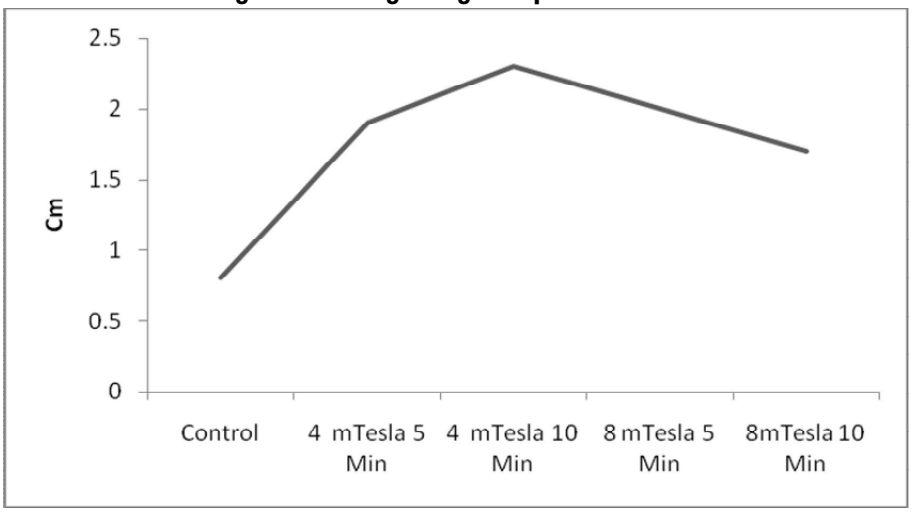

Figure 3:The average length of pine seeds (cm) in treatment

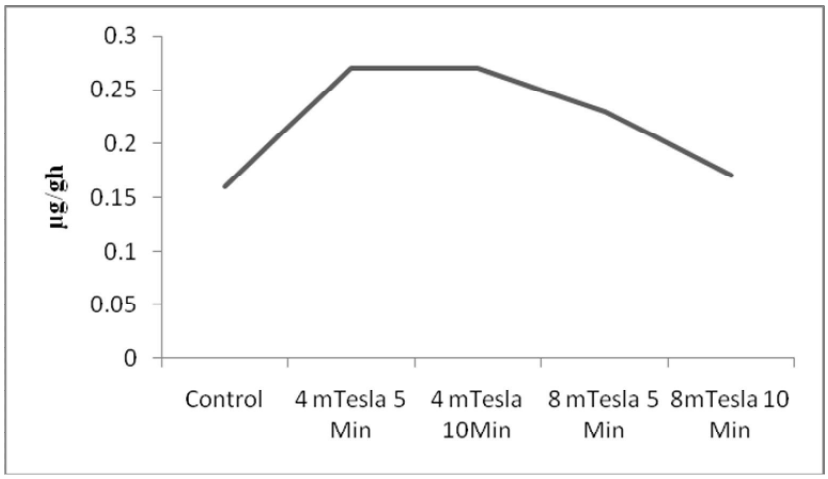

Figure4:The average rate of enzyme activity levels pine buds

Table2: Pine seed test to calculate the level of significance

Factor of Pine	F	Sig
Germination	7.025	0.002
Shoot	0.337	0.849
Root	7.482	0.002
Enzyme activity	10.225	0.000

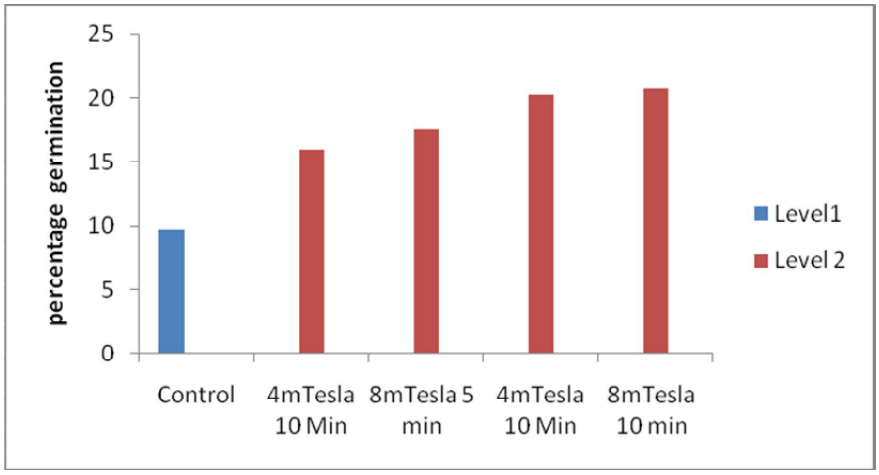

Figure 5:Duncan test for the percent germination of pine

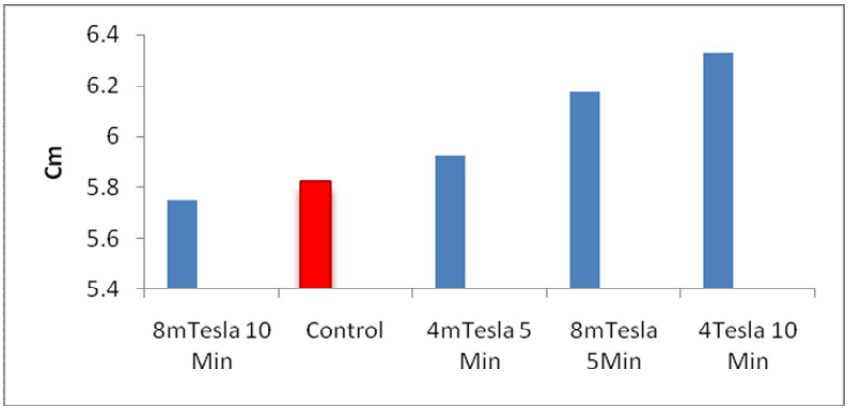

Figure 6: Duncan for stem length (cm) of pine treatments

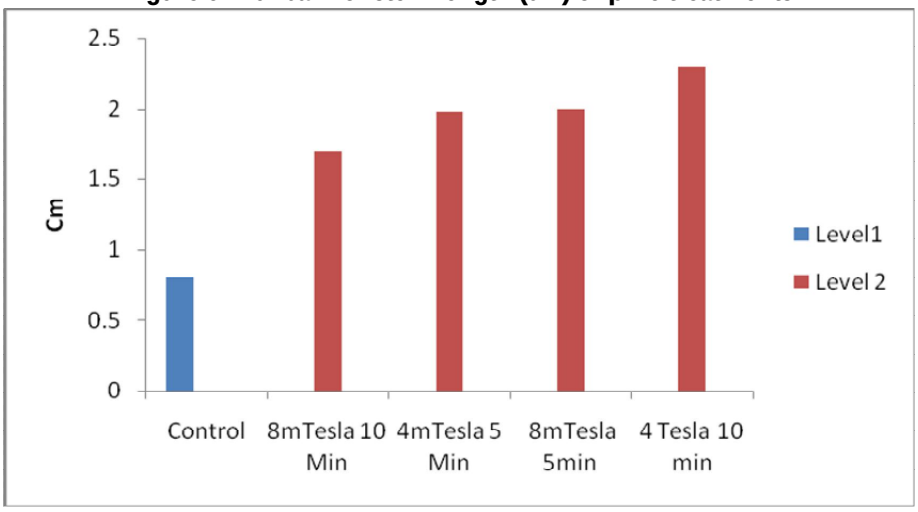

Figure 7: Duncan for root length (cm) of pine treatments 0.05%

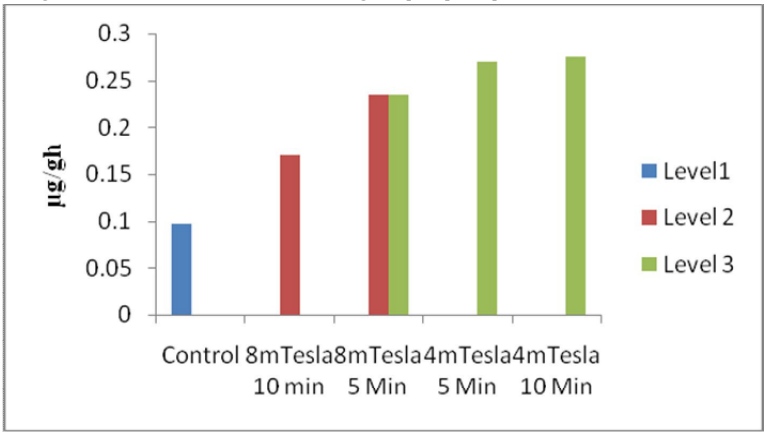

Figure8: Duncan test for enzyme activity in Pine treatments

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ISSN: 0976-0997

MJL& Cited by Thomson Reuters for Zoological survey 2012

Impact Factor :1.233 , NAAS Rating :2.51

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Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Discussing the Relation between Bureaucratic Automation System and Organizational Transformation through the SWOT Technic with Factor Analysis Technic (Case Study: Boukan's Organizations)

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Received: 20 Mar 2015 Revised: 23 Apr 2015 Accepted: 11 May 2015

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ABSTRACT

The Principal aim of the present study is to investigate the relationship between office automation systems with organizational change through the SWOT with factor analysis technique. Research method is survey and 384 people among about 6000 of boukan staffs were selected random cluster sampling. A questionnaire about relationship of automation and organizational change was created and its validity and reliability was compute and confirmed. Results showed that the rate of reduction of employee creativity and human space between people in the organization was the most important among the weaknesses and the highest strengths of relationship of automation and organizational change is increasing the rate of doing works and greater work capacity of employees. However, improve of communication facilities and possibility of integration of information was the top opportunities created by organizational change through automation. Also system error and complicate of Communication in automation has the lowest score among the threats .So the outcome of the strategy of dealing with automation is aggressive strategy and in the first quarter. Results of the factor analysis indicated that the questionnaire was saturated of the five main factors that explained 56.45 percent of the total General Variance.

Key words: automation, organizational change, SWOT process, factor analysis

INTRODUCTION

Current variable and challenging environment has forced organizations to change their internal and external functions, in a way that organizations should be prepared for a better operation of the environment and its related changes as well as overcoming shortcomings and developing strengths; they should also impose changes in structures and processes in order to improve their compatibility (Skinner et al. 2002, Bennis, 1969); Because change is occurred based upon efficiency, functionality and uninterrupted evolution (Qadimi, 2006).

Organizational transformation is a preplanned effort in an entire organization for improvement of effectiveness and organizational health through designed interventions in organizational processes via the application of human and social sciences (Harvey and Brown, 1999).

One of the most useful types of information systems that help managers to control the information flow throughout the organization is the bureaucratic automation system (Ahmadi and Fekri, 2014).

Bureaucratic communications in organizations and economic institutions are totally transformed as a result of increasing development and deployment of technological changes through the world as well as rapid increase in environmental changes and necessity for a rapid and suitable response to these changes. Therefore, implementing the bureaucratic automation system on one hand boosts the pace of operations and on the other hand creates a suitable context for speeding up affairs via collecting the information from the activities of the organization and categorizing them and further, one of the organizational goals is realized through facilitating the process of works (Customer satisfaction and improved human resource efficiency) (Zachary, 1991).

With respect to rapid and increasing changes and evolutions, application of computer facilities and especially the ultra-development of implementing bureaucratic automation in organizational affairs, investigating the effects of such facilities on improvement of the process of organizational transformation are crucial. Momeni (2012) considers automation as the effective management of electronic flow of communications in organizational level, simple querying in stored information, in-time and rapid response to customers, removing paper from organizational correspondence and optimized storage of information and on this basis he also considers for reduction of costs and improvement of humane communications and in this regard he also considers organizational transformation with important purposes such as improving efficiency and effectiveness, reduction of costs, obtaining a certain condition for decision making, improved anticipatory ability and diversification of number and variability of products and services which is in the same direction with the roles of bureaucratic automation (Taheri, 1996). There are a number of researches regarding automation and organizational transformation which are exampled in the following.

Sarafizadeh and Alipour (2010) concluded that implementing automation influences the improvement of efficiency, functionality and effectiveness in the domain of human resources but the amount of these effects was negligible. Ahmadi and Fekri (2012) concluded that implementing automation in these organizations is effective on improvement of quality, reduction of rework, reduction of waiting time and ultimately improvement of performance in international levels; but it does not affect flexibility and competitive pricing.

Sheikh Begloo et al. (2013) concluded that bureaucratic automation positively affects efficiency and its components including optimized application of time, rapid responding to customers, accuracy in work and reduction of organization's expenses. Abraham and Jungles (2011) described how the processes of information systems coordinate their operation procedures with organizational transformations in terms of changes in coordination, aiding culture and learning. Anderson et al. (2007) conducted a research and concluded that organizations are not in fact satisfied with only launching information and automation systems; they need these systems for simplification of expert's work for obtaining a better result. Taghva and Abdulahi (2014) emphasized on the effects of manager's personality on

organizational improvement and transformation. Sarafizadeh and Teymournejad (2013) approved the effects of bureaucratic automation on organizational efficiency. In Rangriz's view, the purpose of information management a part of whose important process is automation is to improve organization's efficiency through improvement of its knowledge for estimation of internal and external needs in a dynamic situation and therefore, optimized information management propagates dynamicity and creativity in an organization and further, increases the improvement of costs through escalation of efficiency. Rashidirad et al. (2009) stated that automation has removed massive information papers through the applications of data bases and personal information storage applications have been replaced for employee's voluminous paper files and therefore, helps to reduce the costs.

Nograsek and Vintar (2014) investigated the relation between organizational transformation and electronic government in terms of depth and nature of transformations and were succeeded to identify key features of three casual organizational levels. Besson and Rowe (2012) investigated the analysis of discourse in strategic organizational transformation and identified four organizational inertia themes and also showed that organizational transformation is a new margin for strategic information as well as being an active and dynamic arena.

Abraham and Jungles (2011) described how the processes of information systems coordinate their operation procedures with organizational transformations in terms of changes in coordination, aiding culture and learning.

Since organizational transformation is a multi-dimensional concept and is necessary in all organizational contexts, it is required to use a systematic approach in investigations regarding this domain. Also with respect to the fact that systematic approach is dominating the entire domain of managerial information system and bureaucratic automation, it seems that we can explain the relation between the establishment of bureaucratic automation system and organizational transformation through systematic approach. On this base, the main question of the present research is: what are the most important external and internal factors of implementing automation in organizational transformation?

METHODS

The method of the present paper is descriptive-survey. The population of this research is consisted of entire organizational employees of Boukan's organizations as 6000 individuals. A number of 384 individuals are selected as the sample through Morgan chart and research questionnaires were distributed among them. Sampling method is a random-cluster method in a way that a number of organizations were randomly picked among the organizations throughout the city and the entire employees of the selected organizations are questioned. For data collection, a questionnaire made by the researcher was used. For this purpose a questionnaire including indexes of strengths, weaknesses, opportunities and threads of implementing automation on organizational transformation and its related components was developed. For determining the validity of data collection instruments, the research questionnaire was checked by six management professors in different universities and the validity level of the questionnaire was measured as 100% through synchronization of judges' opinions regarding the questionnaires.

Also the reliability of the questionnaire was measured by testing on 30 individuals from the sample and the calculated Cronbach's alpha value was 0.954. As it is mentioned in the title of the research, SWOT technic is used for analysis of information.

RESULTS

Most important findings of the research in terms of strengths, weaknesses, opportunities and threads are investigated.

First research question: what are the most important weaknesses of automation in organizational transformation?

Table1 shows that the ideas of sample individuals about the weaknesses of implementing automation in organizational transformation are less than criterion (3) for all questions and this difference is significant at 0.01. For comparing the rank of each question the Freedman test is used and the results are revealed in table 2.

Results of Freedman statistical analysis in table 2 show that the most negative effect of automation on organizational transformation which had obtained the lowest rank for the sample was restriction of employee's creativity as a result of implementing automation. This is while preliminary costs of automation had the least effects on organizational transformation.

Second question: What are automation's most important advantages in organizational transformation?

Table3 shows that the ideas of sample individuals about the advantages of implementing automation in organizational transformation are less than criterion (3) for all questions and this difference is significant at 0.01. For comparing the rank of each question the Freedman test is used and the results are revealed in table 2.

Results of Freedman statistical analysis in table 4 show that the most positive effect of automation on organizational transformation which had obtained the lowest rank for the sample, was speeding up the affairs and increasing the working capacity as a result of implementing automation. This is while reduction of rework and reduction of waiting time had the least effects on organizational transformation.

Third question: what are automation's most important opportunities in organizational transformation?

Table5 shows that the ideas of sample individuals about the opportunities of implementing automation in organizational transformation are less than criterion (3) for all questions and this difference is significant at 0.01. For comparing the rank of each question the Freedman test is used and the results are revealed in table 2.

Results of Freedman statistical analysis in table 6 show that the most important factor of effect of automation on organizational transformation which had obtained the lowest rank for the sample, was improvement of computer's communicative capability a result of implementing automation. This is while environmental considerations in terms of removal of papers and traffic had the least effects on organizational transformation.

Fourth question: what are automation's most important threads in organizational transformation?

Table7 shows that the ideas of sample individuals about the threads of implementing automation in organizational transformation are less than criterion (3) for all questions and this difference is significant at 0.01. For comparing the rank of each question the Freedman test is used and the results are revealed in table 2.

Results of Freedman statistical analysis in table 8 show that the most negative effect of automation on organizational transformation which had obtained the lowest rank for the sample, was possibility of systematic errors a result of implementing automation. This is while the security of automation data had the least effects on organizational transformation.

Overall structure: SWOT strategy

Organization's strategies are determined via the contrast between weaknesses and advantages and opportunities and threads, which is explained in table9 according to yielded information.

The main question of the research was: what are the most important factors of automation in organizational transformation? To answer this question, the factor analysis technic was used.

Results of scrutinizing the sufficiency of sampling shows that this KMO value is more than 0.8, and therefore, samples are sufficient for operation of factor analysis. Also the results of Bartlet are significant at 0.01 and therefore, the factor analysis could be launched.

According to the observations and calculations of table10, it is seen that there five significant factors among the all factors and these five factors had a special value of more than one and totally explain 56.459% of the total variance. The other factors are not significant.

For orientation of factors, VARIMAX method was used. Matrix of the orientated factors after seven cycles is provided in table 11.

Results of scientific analyses show that there are five elements in the questionnaire as follows:

The first factor which includes most of advantages and opportunities of implementing organizational transformation is consisted of questions number 1,2,3,4 and 5 of advantages and third and fourth opportunity questions. Therefore, bureaucratic automation positively influences organizational transformation via appending up the operation of affairs, increasing working capacity, reduction of costs and reduction of travels and the volume of traffic.

Second factor included questions number 2, 3, 4 and 5 of threads which includes the threads of implementing bureaucratic automation in organizational transformation. Therefore, implementing automation imposes threads to organizational transformation via the possibility of storing and recovering information, creating lack of trust among employees regarding implementation of computer systems, possibility for systematic errors and complexity of inter-organizational communications.

The third factor was weaknesses which is the resultant of the first, second and third weakness questions and the first question of threads. Therefore, implementation of bureaucratic automation causes weaknesses for organizational transformation including existence of preliminary costs for buying hardware and required software, reduction of direct contacts and increasing the organization's flowing expenses.

The fourth factor includes the fourth and fifth questions of weaknesses and fifth question of opportunities with a negative coefficient. In other words, weaknesses of impacts of bureaucratic automation on organizational transformation include reduction of employee's creativity and elimination of physical distance and in fact increasing the psychological distance between employees. On the other hand, environmental considerations include negative coefficients in terms of reduction of using paper and show that in the view of the sample individuals, automation has failed to inhibit excessive usage of paper and has even increased the usage in some situations and on this basis, has slowed the process of organizational transformation.

The last factor includes the first and second questions of opportunities. In this regard, automation has provided opportunities for organizational transformation via development of automation software and escalation of communicative facilities.

DISCUSSION AND CONCLUSION

Results indicated that all five questions of weaknesses of implementing bureaucratic automation in organizational transformation were less than criterion (3). Among the five questions, increasing the flowing costs, reduction of employee's creativity and elimination of physical distance were the most important weaknesses of implementing bureaucratic automation in organizational transformation. These results are compatible with findings and results of Ahmadi and Fekri (2014), Avad (2008), Sheikh Begloo (2013), Rangriz (2013), Zachary (1990), Rashidi et al. (2009) and Taheri (1999). Overall, it can be concluded that although mechanization of works can somehow reduce employee's creativity, but these creativities might emerge in other parts of the organizations and more important than creativity, is the management of creativity. Also automation includes reduction of organizational costs and additionally, facilitates communicative processes and lack of direct humane relations and contacts is due to other elements which require further investigations of sociological types.

All five questions of advantages of implementing bureaucratic automation in organizational transformation were higher than (3) theoretical average. Among these five questions, speeding up the pace of affairs and increasing working capacity were the most important advantages of implementing automation in organizational transformation. These results are compatible with the findings of Ahmadi and Fekri (2014) and Zachary (1991).

In the view of Ahmadi and Fekri (2014), bureaucratic automation helps employees in the context of controlling the flowing information and therefore, increases the organization's speed and capacity. On the other hand, Zachary (1991) states that bureaucratic automation provides a suitable context for boosting the speed of affairs and every organization's most important goals as customer satisfaction and increased human resource efficiency is realized via facilitation of the process of works.

Also the results of the research indicated that all five questions of threads of implementing bureaucratic automation for organizational transformation were less than criterion (3). Among these five questions, the possibility for systematic errors and complexity of communications between employees were the most important threads of implementation of bureaucratic automation for organizational transformation. These findings are compatible with the findings of Ibrain (2014), Anderson et al. (2007) but they are inconsistent with the findings of Sheikh Begloo et al. (2013) and Abraham and Jungles (2011).

Analysis of the fourth research question indicated that all five questions of opportunities of implementing automation in organizational transformation were higher than criterion (3). Among these five questions, development of automation software and escalation of communicative facilities were the most important opportunities of bureaucratic automation for organizational transformation. These findings are compatible with the findings of Qadimi et al. (2006), Ahmadi and Fekri (2014), Raymond et al. (2001) and Avad (2008).

According to the findings of research managers are recommended to pay attention to managerial systems such as automation for escalation of organizational processes as strengths of organizational transformation. They are also recommended to pay attention to oral facilities such as online discourse and group relations facilities as facilitation of humane communications and prevention of weaknesses of automation. Managers are also recommended to pay attention to elimination of threads of automation for organizational transformation for anticipation of systematic errors and eliminating them.

In the context of factor analysis, an exploratory factor analysis was performed on questionnaire's items for obtaining the most important factors of role of automation in organizational transformation and it showed that the most important factors of automation's role in organizational transformation are opportunities and advantages (strengths) which are provided for the organization by automation and in fact improve the organizational transformation. After that, threads were the second factors and respectively weaknesses of the role of automation in organizational transformation were the third and fourth factors. More considerations are required for reduction of these weaknesses. Also two items of development of automation software and escalation of communicative facilities were emerged in terms of a separate factor and based on the nature of these two questions, these items could be considered as the context for entrepreneurship and development of employment through applications and business of automation software as well as developing computer's communicative software as new roles of improvement of employment domain.

With respect to the fact that these results tend to divide the research items in terms of strengths, weaknesses, threads and opportunities and the fact that all these categorizations have been approved in previous researches, therefore results of discussing this question are compatible with findings of previous researches by Ahmadi and Fekri (2014), Sheikh Begloo (2013), Anderson et al. (2007) and Raymond (2001).

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Table1.Analysis of importance t of automation's weaknesses in organizational transformation

Question	T	Freedom degree	Significance
1	-5.26	383	0.0001
2	-9.90	383	0.0001
3	-11.22	383	0.0001
4	-11.79	383	0.0001
5	-12.51	383	0.0001

Table2.Results of Freedman test for comparison and ranking of weakness questions

Rank mean	No.	Question
3.35	1	Automation negatively effects organizational transformation via reducing employee's creativity
3.09	2	Automation negatively effects organizational transformation for lack of individual's direct contact
2.89	3	Automation negatively effects organizational transformation via increasing flowing costs
2.89	4	Automation negatively effects organizational transformation via elimination of physical distance
2.84	5	Automation negatively effects organizational transformation via increasing preliminary costs

X^2= 41/134 DF=4 sig<0/0001

Table3.Analysis of importance t of automation's advantages in organizational transformation

Question	T	Freedom degree	Significance
1	33.46	383	0.0001
2	27.95	383	0.0001
3	26.07	383	0.0001
4	22.08	383	0.0001
5	22.79	383	0.0001

Table4. Results of Freedman test for comparison and ranking of advantage questions

Rank mean	No.	Question
3.34	1	Automation positively effects organizational transformation via increasing the speed of affairs
2.98	2	Automation positively effects organizational transformation via increasing the working capacity
2.94	3	Automation positively effects organizational transformation via reduction of costs
2.93	4	Automation positively effects organizational transformation via reduction of rework
2.81	5	Automation positively effects organizational transformation via reduction of waiting time

X^2= 39/94 DF=4 sig<0/0001

Table5. Analysis of importance t of automation's opportunities in organizational transformation

Question	T	Freedom degree	Significance
1	20.72	383	0.0001
2	12.39	383	0.0001
3	24.23	383	0.0001
4	19.02	383	0.0001
5	16.69	383	0.0001

Table6.Results of Freedman test for comparison and ranking of opportunity questions

Rank mean	No.	Question
3.34	1	Improvement of computer's communicative capabilities is an opportunity for organizational transformation
2.98	2	Possibility for integration of information is an opportunity for organizational transformation
2.94	3	Development of automation software is an opportunity for organizational transformation
2.93	4	Environmental considerations and removal of traffic are opportunities for

		organizational transformation
2.81	5	Environmental considerations via removal of papers are an opportunity for organizational transformation

X^2=20.00 DF=4 sig<0/0001

Table7.Analysis of importance t of automation's opportunities in organizational transformation

Question	T	Freedom degree	Significance
1	-5.81	383	0.0001
2	-8.28	383	0.0001
3	-8.52	383	0.0001
4	-10.19	383	0.0001
5	-12.76	383	0.0001

Table8.Results of Freedman test for comparison and ranking of threads questions

Rank mean	No.	Question
3.19	1	Security level of automation information is a thread for organizational transformation
3.11	2	Ability to store and recover information is a thread for organizational transformation
3.09	3	Possibility of systematic error is a thread for organizational transformation
2.94	4	Lack of trust in facilities and computer systems Complexity of inter-organizational communications is a thread for organizational transformation
2.66	5	Complexity of inter-organizational communications is a thread for organizational transformation

X^2=37.35 DF=4 sig<0/0001

Table9.Discussing the type of strategies

Factors	Dimensions	Mean
Internal	Advantages and weaknesses	3.21
external	Opportunities and threads	3.25

Table 10.Value of anticipatable variance by factors

factor	sum	Variance percentage	Cumulative percentage
1	4.764	23.732	23.732
2	2.724	13.619	37.351
3	1.524	7.620	44.971
4	1.271	6.354	51.325
5	1.027	5.134	56.459

Table11.Matrix of question's coefficients in significant factors

Factor 5	Factor 4	Factor 3	Factor 2	Factor 1	
				0/690	Strength 5
				0/677	Strength 3
				0/676	Strength 1
				0/645	Strength 4
				0/626	Strength 2
				0/591	Opportunity 4
				0/519	Opportunity 3
			0/788		Thread 4
			0/741		Thread 3
			0/720		Thread 5
			0/507		Thread 2
		0/740			Weakness 2
		0/726			Weakness 1
		0/487			Thread 1
		0/449			Weakness 3
	0/728				Weakness 5
	0/661				Weakness 4
	-0/471				Opportunity 5
0/792					Opportunity 2
0/736					Opportunity 1

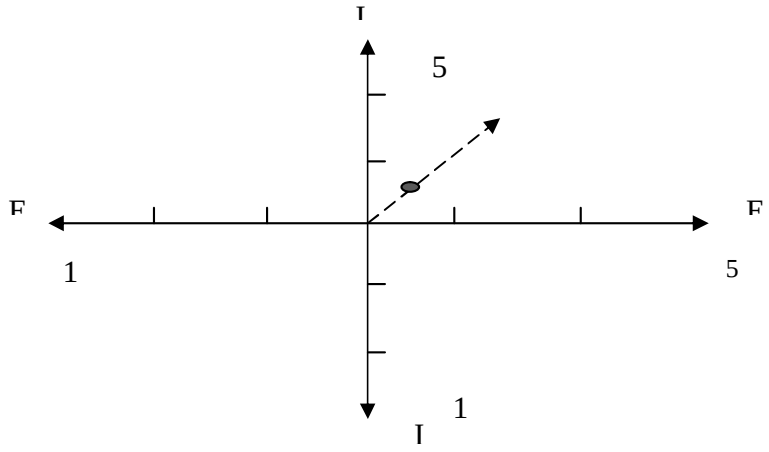

Diagram1: Four factor's estimation strategy

Indian Journal Of Natural Sciences *www.tnsroindia.org. © IJONS*

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

The Study of Methods of using Business Intelligence in the Banking, Point of View of Iran National Banks Myandoab City

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Received: 25 Mar 2015 Revised: 12 Apr 2015 Accepted: 11 May 2015

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ABSTRACT

The principal aim of the present study is identifying the methods of application of Business Intelligence in banking in point of views of the staff of the National Bank of Iran in Myandoab Region. For this purpose 207 people among the staff of the National Bank of Iran in Myandoab Region were selected Stratified random sampling. Research Inventory was researcher made and consists of four components include of Correlation and inference, Analysis tools, arming systems and reporting and the effective decision. The results showed that analysis tools component is one of the most important methods of Business Intelligence using among Myandoab region National Bank employees. The results showed that Correlation and inference component isn't one of the most important methods of Business Intelligence using among Myandoab region National Bank employees. The results showed that Warning systems and reporting component isn't one of the most important methods of Business Intelligence using among Myandoab region National Bank employees. The results showed that effective decision component isn't one of the most important methods of Business Intelligence using among Myandoab region National Bank employees.

Key words: business intelligence, analysis tools, Correlation and inference, Warning systems and reporting, effective decision

INTRODUCTION

In the competitive and complex world of business that is rapidly changing it is vital to have correct and update insight of activities and conditions of business for controlling health status and compliance with commercial

software. Information for having the vision plays a critical role It can also be useful alone provided that it be directional, concentrator, update, and easily accessible and also show the macro(strategic) and micro(operating) dimensional of a business enterprise. Because of advances in information technology some technologies like business intelligence are developed (Mohaghghar et al, 1999).

Use of Business Intelligence gives new life to an organization's strategy because it measures the accuracy and success of the company's goals and objectives(Roglaski,2003).Arya Chandra and Watson(2010) are believed that Business Intelligence conclude that use of technology for collecting data and science for research in order to analysis of firm for Accurate and intelligent business decisions.Chang 2012 defines Business Intelligence Identification and processing mass data Based on pure and intelligence knowledge to help in the decision making process.

Organizations are required to use of intelligence for two main purposes. Firstly for analyzing that can help them in decision making. Secondly would have great help to predict future customer behavior and market demands. Instant access to such information can be helpful decision making and create dynamic changes to improve the company main purpose (Dyolin, 2010). Several studies have shown the importance of business intelligence. From the view of Haghighat Monfared and Shahbani (2012) Business Intelligence can provide analytical and multidimensional reports for administrators in the short time by realing on information technology and software. On the other hand these researchers emphasize on business intelligent as tools for convert row data to Business and Management Information to assist decision-makers in the organization. Ghods(2009) believed that automatic analysis tools and specializing processes of business intelligence causes that large amounts of data Extracted, transformed and stored. Gary 2003 states that business intelligent is considered Fundamental Investment of Company that may increase the rate of making decisions and to have customer satisfaction much researches has been done in the field of business intelligence that the results of some of them are mentioned.Ravnaghi and Faizi(2013) focusing on provide a framework as a tool for Analysis and Performance Assessment Intelligent Business Systems and the optimal performance of that system.Ravnaghi indicated that there is direct and positive correlation between maturity level of business intelligence systems and access quality and content of information. Rahnamae Rodposhti and Mahmudi (2010) concluded that use a model based on business intelligent in the management accounting information systems has positive results. Mirabi et al concluded that important advantages of banking business intelligence systems are a high level of quality reports, reduce costs, improving organizational communications, increasing customer satisfaction, rapid responses to environmental changes. Ghazanfari et al (2008) are focusing on integration and standardization of systems and organizational process as the main features of Business Intelligence. William and Andy2009 in an essay examined the basic factors in success of the implementation of intelligent commercial systems and have emphasized on aspects of success in the organization.also Hanola and Pyrtymaky 2003 argue that the most important advantages of Business Intelligence is access to reports and information with better quality, decision making, Saving Time, improving abilities for predict threats and opportunities by using warning systems, the database growth, increasing sharing of information, improving performance and quick decision making.

Because of commerce penetration to the markets that are using advanced communication channels, the growth of information technology every day will be more complex and dynamic. So in this research the effectiveness of business intelligence system enables banks that decide with more awareness. Given the importance of Business Intelligence the current study is researching this issue in the Melli Bank in Myandoab region and the main research question is: what are the most important methods of use business intelligent in the forms of business Intelligence components between staffs of Melli Bank of Myandoab?

METHODS

The present study is considered a survey descriptive and applied research. The current study in terms of goal is practical and in terms of methodology uses the quantitative approach and in terms of type of research is descriptive –

survey. The researcher made questionnaire was business intelligence that was developed in 20 questions according to 4 components of Rahnamay Rodposhti and Mahmodi 1389.this questionnaire after the preparation and review again it was reviewed by a few of masters of Management field of colleges of Azad university of Bokan and Shahindezh and its validity was confirmed. Also the reliability of the questionnaire was estimated 0/844 based on Cronbach's alpha. The questionnaire was consisting of 4 components of correlation and inference, analysis tools, warning and reporting systems and effective Decision Making. The population of the research was staffs of Melli Bank branches of Myandoab about 450 people. Sampling method in this study is stratified random sampling. Statistical sample for the study according to cochran sampling formula in the finite population calculated 207 people in the level error of 0/05.for data collection the research questionnaire was distributed between 207 people of Melli Bank staffs in Myandoab region. Descriptive and inferential statistics and SPSS statistical software were used for data analyzing.

RESULTS

To examine research questions the T single sample analysis were used. For this purpose the theoretical mean calculated that was obtained by dividing range by two and add the product to the lowest possible score. For example in the connections and inferences component the range is equal to 15 score from 7 to 22.15 divided by 2 is obtained 7/5 then by add 7 to it would be 14/5 that is considered theoretical average.

The results of T single sample analysis in table-1 shows that the mean of use of communication and inference component of intelligent business is equal to 12/53 that is lower than theoretical average 14/5 by degree freedom206 and in the meaningful level of 0/01.in other words we can say that the communication and inference component isn't raised as one of the main methods of use of business intelligence in the staffs of Melli Bank of Myandoab region. For examine communication and inference component indexes every questions of this component were reviewed and rated in the form of Fredman statistical analysis.

Results of table 2 indicated that the use of scientific reasoning from communication and inference component as one of the main methods of business intelligence between staffs of Melli Bank is more than other indexes. Then the argument based on modern knowledge, good relationships with other financial and banking institutions, the use of mobile banking and internet banking services respectively were as the most important communication and inference indexes of staffs of Melli Bank of Myandoab region.this ranking is meaningful in the significant level of 0/01.

Also the results of T single variable analysis in the form of table 1 indicates that the mean usage of intelligent business analysis tools is equal to 18/30 that is higher than theoretical mean 17/5 by freedom degree 206 in the significant level 0/01.in other words we can say that analysis tools component is raised as one of the main methods of intelligent business of staffs of Melli Bank of Myandoab region.the questions of this component in the form of Freedman statistical analysis were ranked and analyzed for examining indexes of analysis tools component.

The results of table 2 shows that the use of computer simulation for explain various events of analysis tools components is more than other indexes between staffs of Melli Bank as one the main methods of use of intelligent business. Thereafter modeling from the programs and methods of optimization, flexible decision making, decision making based on data mining, powerful decisions, the availability of data storage and finally existence facilities for analysis of gains and losses in the form of figures, sings ,etc respectively were as one the most important analysis tools indexes among staffs of Melli Bank of Myandoab region. This ranking is meaningful in the significant level of 0/01.

The results of T single variable analysis in table 1 shows that the main use of warning and reporting system component of business intelligent is equal to 11/93 that is more than theoretical mean 15 in the freedom degree 206

and significant level 0/01.in another words we can say that warning system component is raised as one of the main methods of use intelligent business among staffs of Melli Bank of Myandoab region.

Every questions of this component in the form of Freedman statistical analysis were examined and ranked for examining indexes of warning and reporting components.

The results of table 3 shows that the amounts use from Bank performance report as different graphs from warning and reporting system components as one of the main methods of intelligent business usage among staffs on Melli Bank is more than other indexes. Thereafter using from different informing models to staffs and customers of Bank computer processes for informing customers and staffs, Gains and losses warning systems and finally different softwares for Bank performance analysis report in the other rankings are located among staffs of Melli Bank of Myandoab region as the most important analysis tool indexes. However, the rank of all indexes is lower than theoretical mean. This ranking is meaningful in the significant level 0/01.also results of T single variable in table 1 shows that the mean use of effective decision making intelligent decision is equal to 10/59 that is lower than theoretical mean 11/5 with freedom degree 206 in the significant level 0/01.in other words we can say that effective decision making component is not raised as one of the main methods of intelligent business usage among staffs of Melli Bank of Myandoab region. For examining indexes of effective decision making the every questions of this component in the form of Freedman ranked and investigated.

The results of table 3 shows that the amount use from group decision making from effective decision making as one of the main methods of intelligent business usage among staffs on Melli Bank is more than other indexes. Then using from summarization for speed up the affairs of the organization, flexibility and dynamism in the organization and optimization banking operations by special techniques respectively as the most important effective decision making indexes among staffs of Melli Bank of Myandoab region. However rank of all indicators is lower than what expected. This ranking is meaningful in the significant level o 0/01.the main question of the research was what are the practical methods of intelligent business in the banking from the views of Melli Bank staffs? For answering the question the Freedman analysis, chats and descriptive indices were used.

Results of table 4 shows that the amount using from communication and inference component is more than other component among staffs of Melli Bank of Myandoab region. Also thereafter is communication and inference and in the third degree there is warning systems and finally there is effective decision making. This ranking is meaningful in the significant level 0/01.

DISCUSSIONS AND CONCLUSION

The principal aim of the present study is identifying the methods of application of Business Intelligence in banking in point of views of the staff of the National Bank of Iran in Myandoab Region. Results showed that communication and inference is not raised as one of the main methods of application of BI in the Melli Bank of Myandoab Region. These findings are in contrast with Chandra Arya and Watson (2010), Malorta (2000), Ghods (2009), Mirabi et all (2010), Haghighat Monfared and Mayani (2011) and Ghazanfari (2008).

It seems that one of the reasons for the conflicting results with previous findings the freshness of BI and its mechanisms for staffs of Melli Bank in the region. Given that the communication is less with other institutes of banking and finance and in the banking space although modern technology and sophisticated tools of communication can be seen yet rule based on knowledge management is low thus we can expect that communication and inference component among staffs of Melli Bank of the Myandoab region is in the low level. The examination results of the second question showed that using from analysis tools as one of the main methods of application BI is

Melli Band of Myandoab is raised.these results is in consistence with Ravnaghi and Faizi (2013), Haghighat Monfared and Shahbani (2012),Gopta (2003), Azof (2004) and Asadi and Hasani (2009).

Investigation of the third question revealed that the warning systems isn't raised as one of the main methods of BI usage in Melli Bnk of Myandoab region.these findings are in contrast with Eastwood(2005),Hnla and Pirtimaki(2003), Haghighat Monfared and Shahbani(2012),Mirabi et al(2003) and Ravnaghi(2013).

In explanation the contradictory results with previous research clear that in the Banks of Myandoab region there is no certain and processes systems for informing staffs and customers from the current status and online warning systems and computer soft ware's have poor actions in analysis and controlling banking performance. From the other hand the attitude of the staffs about warning systems is a negative attitude thus the warning and reporting systems have no proper place among staffs. Effective decision making is not raised as one of the main methods of BI usage in Melli Bank of Myandoab region these results are in contrast with Chang 2012, Gopta 2003, Sabroal and Fernandez 2010, Diolin2010, Gary 2003 and Hanel and Pirtimaki 2003.

In definition the contrast the obtained results with the results of previous studies we can say that the grouping decision making is low and flexibility and dynamism in the banking organization of Myandoab region is low and optimization techniques banking cannot be seen thus the variable level of effective decision making has been in the low level.

Due to the fact that communication and inference component level, warning and reporting systems and effective decision making was in low level we recommend administrators thinking about upgrading these components and indicators by some strategies. Given that the level analysis tool component was in the suitable level we recommend that while maintaining current status thinks about its quality improvement.

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Table-1: The T single sample analysis for comparison communication and inference component with average theoretical

Variable	Number	Average	Average theoretical	SD	T	Freedom degree	Meaningfulness
Communication and inference	207	12/35	14/5	3/59	-8/576	206	0/0001
Analysis tools	207	18/30	17/5	4/25	2/72	206	0/007
Warning Systems	207	11/93	15	3/52	-12/53	206	0/0001
Effective Decision Making	207	10/59	11/5	3/58	-3/61	206	0/0001

Table2-Indicator rankings

Question	Communication and inference	Question	Analysis tool component
Question2	4/24	Question12	4/63
Question1	3/99	Question13	4/52
Question4	3/52	Question11	4/06
Question3	3/37	Question8	3/99
Question5	3/07	Question10	3/95
Question6	2/81	Question9	3/67
		Question7	3/19
X=136/14 df=5 Sig= 0/0001		X=83/04 df=6 sig=0/0001	

Table-3 Ranking indexes of warning system components

Question	Warning systems	Question	Effective decision making
Question18	3/28	Question19	2/82
Question16	3/10	Question21	2/49
Question17	2/96	Question20	2/48
X=22/62 df=4 Sig<0/01		X=38/22 df=3 sig<0/01	

Table-4 Ranking BI components

Question	The mean of ran
Analysis tools	3/87
Communication and inference	2/34
Warning systems	2/15
Effective decision making	1/64

X^2=359/4 df=3 sig<0/01

Indian Journal Of Natural Sciences *www.tnsroindia.org. © IJONS*

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Ranking of Tourist Destinations for Tourism Development (Case Study: Sistan Region)

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Received: 20 Mar 2015 Revised: 11 Apr 2015 Accepted: 20 May 2015

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ABSTRACT

Lack of a scientific and systematic ranking system along with inappropriate distribution of facilities and equipment is one of the most fundamental and obvious shortcomings used for determining the spatial-local position of the tourist attraction centers in the tourism development studies and projects conducted in the country and especially in Sistan region of Sistan and Baluchistan province. Sistan region has potential capabilities to develop tourism, yet its potentials have never been met, mainly due to various reasons such as lack of comprehensive studies. The present study attempted to examine the natural, historical, and cultural capacities as well as the spatial distribution of tourism attraction sites in the area of research and ultimately, it tried to determine the priority of these attractions in terms of tourism development in the area. As a descriptive- analytic research, it uses SPSS software for data analysis. The obtained results showed that based on the binary AHP comparisons, some infrastructures (0.352) and reliability of the project (0.216) are produced and more than 50% of the weight of this area belongs to these two factors indicating the significance of infrastructures in ranking the tourist sites.

Key words: AHP model, ranking, Sistan, tourism, tourist centers.

INTRODUCTION

Development and prosperity of tourism activities in every area are the result of planning and policies that are developed for the region. Overall, as a critical approach to guide future development, planning is generally accepted. Having no plan for development process is considered an incidental, vulnerable, partial phenomenon that will probably fail. Today, in tourism planning is mostly followed in many countries and regions that are seeking for the controlled development of tourism (Inskeep, 1991: 26). Since there are many differences between the macro - level planning and the micro- level planning (Guun and Var, 2002: 12), scholars in tourism industry have classified tourism planning at different levels. In regional planning, programming for areas of the country, such as states, provinces, or a set of islands, is prepared and modified within the framework of national development policies and programs (Inskeep, 1991: 26). Sistan, a region located in the province of Sistan and Baluchistan, is one of the regions of the country that despite its historical, cultural, and natural attractions, still lacks a proper planning in the tourism sector to meet its potential, and tourism industry has failed to play its role in its regional development. Regarding the development of tourism in developing local communities and rural areas requires introducing and identifying its potential, strengths, problems, and structural and functional deficiencies in less- developed areas. Hence, this study has attempted to plan tourism development, emphasizing the knowledge of its problems and shortcomings with a comprehensive and systematic approach. It has also evaluated the capabilities of these tourist attractions in order to identify and prioritize these tourism areas for in Sistan region.

Theoretical foundations

Tourism is a French term derived from the root "tour." In French, tour has the following definitions: rotational movement (circulation), traveling around, hiking, stroll, and explore. According to Pierre Larousse[1], tourism connotes to expenditure with pleasure, and a tourist is someone who travels for his/ her own contentment and joy (Mahalati, 2001:2). In 1811, the term "tourism" was coined in the British Journal entitled Sporting Magazine (a sports magazine). At that time, the word "to tour" stood for "to travel" in order to see historical monuments and to visit landscapes and its ultimate aim was to obtain delight (Mahalati, 2001:3). In fact, tourism is a group of people's activities who travel to other places out of their houses and working places to have fun and entertainment and rest and perform other affairs, but they won't settle in that area for more than a year (Dos Will, 2000:19). In Persian culture and literature, tourism is defined as travelling across the universe and its purposes are recreation, sightseeing, pilgrimage, and travel to a destination and return to the original place. Moreover, it includes short- term and temporary trips out of one's work areas and his/ her main residence for visiting the attractions (Kazemi, 2001:23). In other words, tourism comprises all phenomena and relationships resulted from mutual interactions between tourists, investors, governments, host communities, universities, and non-governmental organizations in the process of attraction, transportation, catering, and monitoring tourists and other visitors (Paply Yazdi and Saghaei, 2007:12, extracted from Warver, 2000: 3).Tourism is discretionary spending leisure time in a place other than the place of permanent residence to enjoy tourism bliss (Baher, 1998: 94). Although tourism is considered an international activity, many tourism organizations are actively involved in national or local markets and most of this activity usually takes place within national borders. However, it plays a significant role in the national economic cycle. The most common forms of travel are the tours taken by the residents of a country and the global cost of domestic tourism is about ten times of the global international tourism (Zirak bash, 2007: 16). This travel- oriented tourism industry includes comprehensive objectives in the fields of sightseeing, pilgrimage and the like, so its field of activity is more than that of other economic activities, whereas its investment costs are much less than other economic affairs'. That is because most ancient discoveries, historical monuments, natural landscape can change into valuable tourist attractions through allocating little investment and proper compliance with standard regulations and criteria of the tourism industry (Varesi, 1996: 28).

RESEARCH METHODOLOGY

In order to rank tourist attractions, first, the theoretical foundations of the main criteria affecting the regional development of tourism were defined and then, 40 people were selected by experienced tourism experts and instructors. Finally, the questionnaires were analyzed by SPSS software.

Geographical location of the area

Sistan, in the extreme eastern border of the country, is located at coordinates of 30° 18' N to 31° 20' and L 61° 10' N to L 61° 50' E of the Greenwich meridian. Its eastern border, which has stretched along the Helmand River, is the border between Iran and Afghanistan, so from the North and East, it is limited to Afghanistan and to the south, it is limited to Zahedan (Ebrahami, 2009: 29).

RESEARCH FINDINGS

Based on their gender, the respondents were divided into 183 male (45.75 %) and 137 female tourists (35.25%) and the officials also included 55 males (13.75%) and 25 females (6).

The first hypothesis test

• It seems that the rate of tourist- related infrastructures have the greatest impact on level of tourist sites.

To check the accuracy of the above hypothesis, the Chi-square test was used (Table 1). I the chi-square analytical method, first, its null hypothesis and its contradicting hypothesis are ranked. Then, based on the statistical rate of the Chi square test, they are approved or rejected.

H0 : the tourism- related infrastructures do not have the greatest impact on the level of the tourist destinations.
H1: the tourism- related infrastructures have the greatest impact on the level of the tourist destinations.
Table 3 illustrates the first hypothesis testing to show the expected quantity values along with degrees of freedom and its significance level. The first row of the table is X2 which is obtained from the following equation:

$$X^2 = \sum_{i=1}^{m} \frac{(O_i - e_i)^2}{e_{ij}}$$

According to Table 3, the amount (sig) or the significance levels corresponds with this factor which is less than that (p <0/05), so the null hypothesis is rejected with sufficient certainty. On the other hand, according to Table 1-5, 79.3% (n= 317) of the respondents recognized the role of infrastructures related to tourism which had the highest impact on level of tourism sites. However, the expected number of people equals 80; therefore, there were 237 people more than the expected number. In contrast, just 8.3% (n=33) identified the lack of the related infrastructures with the highest effect on level of tourism areas. In other words, the number of the observed cases was 33 people, while 80 people have been expected, so this number was 47 people less than the expected number. Since X2= 276 (Table 18-5) which was much more than the expected X2 (Table 2-5), and since its freedom degree= 4 (Table 3-5) and its significance level = 0.001, it can be inferred that the first hypothesis of this test was approved based on the ideas of the tourists and the officials. Moreover, according to the AHP binary comparisons (Table 14-4), presence of infrastructure (0.352) and the

ability to implement the project (0.216), more than half of the weight of this sector belonged to these two factors reflecting the importance of infrastructure in classifying tourism centers; therefore, the first premise of the test was confirmed by AHP binary comparisons.

The second hypothesis test

It seems that among different regions of Sistan, Shib-e- Ab has the highest potential for tourism development. Since the rate of the tourism and ecotourism potentials in each region can ideally attract large numbers of tourists to the region, and regarding the fact that providing service and health facilities and infrastructure without tourist centers cannot be effective in organizing and attracting tourists in the region. Figure 6-3 represents six regions of target tourism in Sistan. Moreover, there are 5 major tourist attractions in the area. Table 3-4 shows that the level of visit purposes for all tourists was as follows: entertainment (20%), visits to natural monuments (32.5%), visits of historical monuments (42.5%), and exercise and using sports opportunities (5%).

Therefore, it can be concluded that due to the importance of tourism facilities for tourists and the availability of the largest tourist centers in the Shib-e Ab region, the region has higher ability for tourism development. Hence, as far as there are more tourist attractions in this region than other areas of the Sistan plain, it can provide better job opportunities to enhance and organize tourism. The performed analyses have confirmed this hypothesis, so it is acceptable.

CONCLUSION

Today, the huge and global tourism industry with its unique characteristics has numerous impacts on economic, social, and cultural conditions of societies, and is considered as an important factor in economic development and job creation in developing countries. Based on the viewpoints of the experts and tourists, it can be inferred that 79.3 % (n=317) of the respondents emphasized on the tourism- related infrastructures which had the greatest impact among the level of the tourism centers. Since X2= 276 (much more than the expected X2), the degree of freedom=4, and its significance level= 0.001, the results of this chapter showed that the rate of the tourism- related infrastructures owned the greatest impact among the level of the tourist sites. In addition, regarding the AHP binary comparisons, availability of infrastructure (0.352) and the ability to implement the project (0.216) which is more than half of the weight of this sector belonged to these two factors. It also reflected the importance of infrastructure in the level of these tourist centers. Despite the presence of these tourist attractions in the Shib-e- Ab region that are more than other regions of Sistan, it can both create jobs and organize and boom tourism industry in the region.

Suggestions

Identify the tourism target sites using their level and introduce them to tourists for further visits of these centers
- Increase sense of security in the tourist attraction sites of the region and enhance tourists spend more time in the region
- Establish the required county and guide the tourists in order to restore order in areas of accommodation for tourists
- Create free trade centers in order to attract tourists
- emphasize on the environmental problems such as sand dune stabilization in order to enhance tourist attraction

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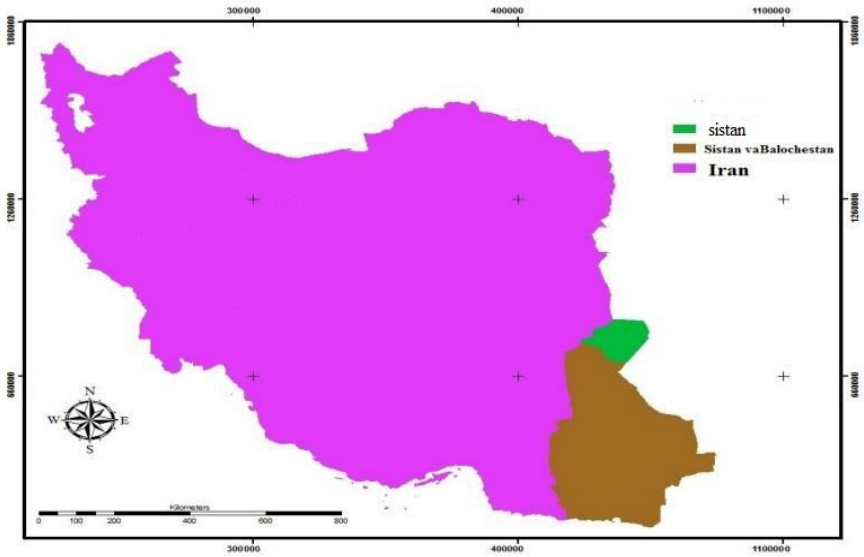

Figure (1) position in the region, Sistan-Baluchistan province

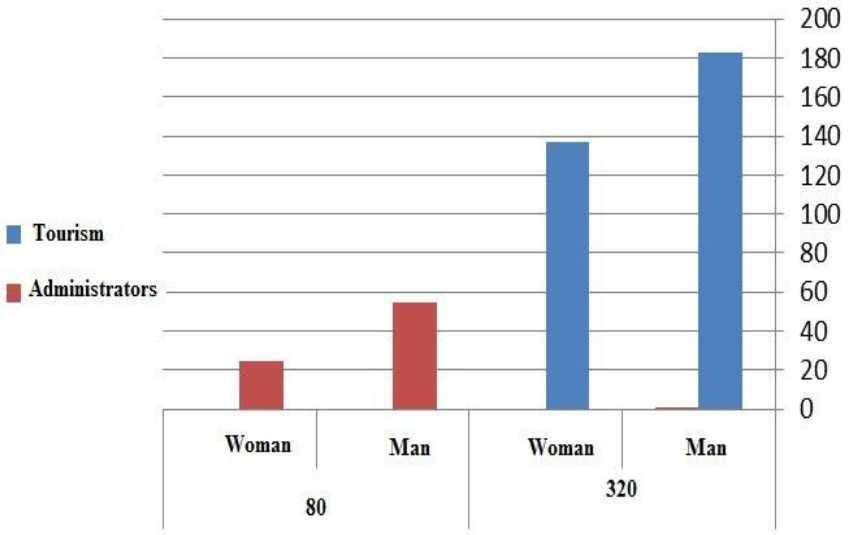

Figure 2: Distribution of respondents by sex

Table 1: shows the rates of frequencies and the percentage of respondent frequency based on the role of tourism infrastructure which has the greatest impact on the level of the tourist sites.

Total		Very low		Low		Average		High		Very high		Situation respondents
Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	
80	320	3	12	4.3	17	10	40	29	116	33.8	135	Tourists
20	80	0.5	2	0.5	2	2.5	10	5.5	22	11	44	Authorities
100	400	3.5	14	4.8	19	12.5	50	34.5	138	44.8	179	Total

Table 2: shows the rates of the observed frequencies (cij) and frequency of the expected rates (oij) under the variable independence assumption, ie cij.

The remaining	Expected (cij)	Number of Views (oij)	The planning and design of facilities management		
99	80	179	Very high	400	
58	80	138	High		

-30	80	50	Average		Respondents
-61	80	19	Low		
-66	80	14	Very low		
		400	400		Total

Table 3: Chi-square test

Sig	df	Value	Type of test
0.001	4	276	Chi-Square
400			Count

Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

The Relationship between Age and Criminal Responsibility of Children and Young People Based on the Islamic Penal Code of Iran

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Received: 20 Mar 2015 Revised: 18 Apr 2015 Accepted: 20 May 2015

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ABSTRACT

The age of criminal responsibility have always been a controversial issue of Iran's Criminal law and are constantly evolving in order to improve and meet the community's needs. In the Islamic Penal Code of 2013 of Iran, in contrast to the previous legislation, it has been tried to adopt a supportive and correctional approach toward children and young people. In this regard, although based on the former procedure, the age of criminal responsibility is determined 9 years for girls and 15 years for boys but, three age groups were defined for children to enforce the criminal liability including the ages of 9-12, 12-15 and 15-18. The specific measures are considered for each age group based on their intellectual and mental condition. However, despite all the positive aspects of this law, some critics have also been raised by the scholars such that in some cases, they considered this law as discriminatory and in favor of girls. In this paper, the relationship between the age and criminal responsibility of children and young people in Islamic Penal Code of 2013 of Iran, and its objections was discussed.

Key words: age, criminal responsibility, children, Iran's Islamic Penal Code.

INTRODUCTION

The age of criminal responsibility has always been a challenge to the Iran's Criminal law. This is an important issue since the criminal codes are sometimes in conflict with international standards, scientific, legal, and sometimes juridical principles. Therefore, the laws related to the age of criminal responsibility have been modified several times in Iran. In addition, the rise of anomalies and social and behavioral deviations among young people has led to the increase of the criminal population in the community and consequently, the authorities have sometimes deviated

from the criminal standards and principles. Furthermore, the basic principles of criminal law, such as the age of criminal responsibility, the minimum age for lack of criminal responsibility and responding to Juvenile delinquency are not yet compatible with the needs of the community and do not meet the accepted international standards in Iran and a lot of the failure is observed.

The importance of this issue has caused the Fuqaha (plural of jurists in Islamic law) and legal scholars to argue about the issue of the age of criminal responsibility and criticize each other's opinions. One of the most controversial issues in this regard is the issue of sexual and intellectual maturity since the view about these two types of age affects the criminal law especially the law regarding the age of criminal responsibility. Shi`a fuqaha have determined the age of criminal responsibility in the Islamic Penal Code as the age of 9 years old for girls and 15 years old for boys based on the age of religious maturity. However, today, the criminal perspectives have changed and consequently significant gains have been achieved in the field of juvenile justice.

These achievements include the creation of differentiated criminal policy, having main correctional purpose, returning to society and becoming socially responsible. Considering the importance of the age of criminal responsibility and the recent differences in approaches, the present paper examines the latest changes in Islamic Penal Code Act (IPC) of Iran approved in 2013 concerning the relationship between the age and criminal responsibility for children and young people.

MATERIALS AND METHODS

Criminal Responsibility:

Everyone is responsible for the consequences of his criminal acts or omission. In criminal law, this means accepting responsibility and consequences of criminal acts. In fact, the criminal responsibility is established before committing a crime by individuals and means the capability and capacity to undertake and bear the consequences of committing a crime. Accordingly, it can be said that criminal responsibility includes requiring someone to be liable for the consequences of crime. Criminal responsibility also has some principles including criminal capacity and fault or mens rea.

Criminal capacity includes two components of sanity and voluntariness. Sanity means the ability to understand and recognize the actions and their consequences [6]. Consequently, if the criminal is not free, he is not responsible for his acts. Therefore, it is significantly important to define the boundaries of criminal responsibility. Criminal responsibility has some conditions:

The person has to reach as certain age;

The person should not be insane;

The person's will should not be influenced by coercion or any other factor

The age of criminal responsibility is when the person has reached a degree of maturity to be considered guilty. In fact the age of criminal maturity or the age of criminal responsibility is the age when the criminal is considered as an adult and mature criminal and the criminal law applies for him/her; [8]There has always been disagreement among the jurists on the issue of age of criminal responsibility. There are three main disagreements in this regard:

Some jurists are concerned with the criminal maturity without considering any specific age. That is, if the person is not aware of his criminal responsibility for his action, his criminal responsibility is over; Some others consider a specific age of criminal responsibility and believe that an individual is responsible after reaching this age;

Some jurists have criticized the maturity criterion and considered the intellectual maturity

Rules of the criminal responsibility of children in Iran:

The rule for age of criminal responsibility has been changed in Iran for several times. First, in 1925, Articles 34 to 38 of the law discussed the criminal responsibility of children and its punishments, and age of 18 was determined as the age of criminal responsibility; but this law could not succeed in practice. In 1959, a new law was amended, and the age of criminal responsibility was reduced to age of 6. However, due to lack of proportionality between crime and punishment, it was not accepted by public. After the Islamic Revolution, as a result of comprehensive changes in country's rules, criminal law of children also was changed. Although, these laws have been widely criticized, but it has always been tried to recognize and remove the defects and harms by experimental law enforcement.

After the Islamic Revolution some corrections were made in 1981 and according to article 1210, the legal maturity was set as criteria. In 1991 some other corrections were made in the penal code but according to article 1210, the age of criminal responsibility (9 for girls and 15 for boys) remained unchanged, and reaching these age limits create full responsibility for individuals. Many of the critics believed that this law is approved without considering the social and mental realities.

In this act, same as some of the previous versions, there was no difference between the newly matured and adult individuals in execution of punishment. That is, an individual becomes criminally responsible as reaching the determined age.

However, after that, in 2009, a bill on criminal responsibility of children was approved by Guardian Council of Iran, in which the offenders were divided into three groups:

The children under the ages of 9 who had absolutely no criminal responsibility and were not criminally addressed;

The juveniles who are 15 years old at the time of committing a crime and in case of ta'zir punishment, their responsibility are frayed and the adult punishment is not imposed on them. This age group, in case of the most sever ta'zir punishment are sentenced to the maximum one-year imprisonment in a juvenile institution.

The juveniles who are 15 to 18 years old the time of committing a crime. Their responsibility is also frayed in case of ta'zir punishment and the adult punishment is not imposed on them. In case of the most sever ta'zir punishment are sentenced to the maximum five-year imprisonment in a juvenile institution.

Now these issues can be observed in the Islamic Penal Code of 2013 of Iran. In fact, although based on the act 147, the legal age of responsibility is 9 for girls and 15 for boys [12], but some modification were made to correct the previous laws including the gradation in criminal responsibility, and determining a specific age for modifications and changes in verdicts.

The age of criminal responsibility in IPC of 2013:

Due to the existing disagreements about the age of criminal responsibility, the IPC of 2013 has considered the issue of gradation as a criterion for fulfillment of criminal responsibility. That is, the age of lunar maturity has been considered as the age of criminal responsibility and the diminished criminal responsibility was considered as the age of 18 for both girls and boys. The article 140 of the Islamic Penal Code has based the criminal responsibility on wisdom, maturity and authority according to most of the jurists. However, since the criminal responsibility has a grading nature, a relative condition has been considered for the individuals' responsibility. It means that, the individuals with relative wisdom and maturity cannot be considered as lacking the criminal responsibility and also the complete punishment cannot be applied for them. Therefore, diminished responsibility is accepted for them.

The IPC of 2013 pay attention to social and mental realities and it is believed that children or young people do not have the full mental capacity and social responsibility to avoid the offense at the beginning of the criminal responsibility. In fact, reaching the age of maturity is considered as the age of criminal responsibility not as the complete responsibility. In this regard, there is no discrimination among boys and girls. Finally, the age of criminal responsibility is completed at the age of 18 for all the individuals. However, there are some exceptions. According to article 88 and 95 of the IPC of 2013, the age of criminal responsibility for Hudud (crimes against God) or Qisas (retaliation in kind) punishments was considered as 9 for girls and 15 for boys.

DISCUSSION

Relationship between age and criminal responsibility in IPC of 2013

The new Islamic Penal Code which approved in 2013, has been an attempt to align with international rules and 1989 Convention on the Rights of the Children (CRC). In this act, new substantive reforms have been made to support children and young people as a vulnerable age group. According to this act, the age of criminal responsibility and punishment is in a way that the supportive and correctional measures are in favor of the children and young people and lead to their restoration to society.

As the gradation in age of criminal responsibility has been accepted in IPC of 2013, special ages have also been considered for the sentences. That is, children and young people have been divided into three age groups of 9-12, 12-15 and 15-18, and accordingly, specific laws have been established for each group in accordance with the characteristics of the groups. According to article 88, full punishment is not applied for the children between 9 and12 years old, but other measures were devised as follows:

Handing over to parents or natural or legal guardians while taking promises to correct and educate the child or youth and taking care of their good behavior.

Note – When the court finds it in the best interest [of the child], it can take promises from the persons mentioned below:
Referral of the child or youth to a social worker or psychologist or other specialists and cooperation with them;
Sending the child or youth to an educational and cultural institute in order to study or learn a skill;Required measures in order to treat or rehabilitate the addiction of the child or youth under the supervision of a doctor;Banning the child or youth from the harmful association with and contacting [specific] people at the discretion of the court;Banning the child or youth from going to specific places

Handing over to other natural or legal persons that the court finds to be in the best interest of the child or youth
Note- Handing over the child or adolescent to the qualified persons is subject to their acceptance.
Advising [the child or youth] by the judge
Cautioning and warning or taking a written promise not to commit an offense again
Detention in the Correction and Rehabilitation Center

Note 1- Decisions mentioned in paragraphs (d) and (e) shall only be applicable on a child or youth between twelve and fifteen years. In the case of commission of ta'zir crimes of the first to fifth degree, application of provisions of paragraph (e) shall be mandatory.

Note 2-If a child who has not become mature commits any of offenses punishable by hadd or qisas, if s/he is from twelve to fifteen years of age, s/he shall be sentenced to one of the measures provided in paragraphs (d) or (e); otherwise, one of the measures provided in paragraphs (a) to (c) of this article shall be applicable. (Islamic Penal Code Act, 2013)

As it can be seen, these decisions are not for punishment, and more include security and correctional measures. Here, one problem should be mentioned in this act and it is gender difference. According to article 147, boys between 9-12 years old lack criminal responsibility, but it is deferent for girls. Grading criminal responsibility for the girls has been considered at the age of 9-12 while the article 147 stated the lunar year. It should be noted that although the act has tried to be no difference between girls and boys in a specific time period, but this caused the ignorance of the crimes and offences committed by 9-years-old girls in lunar and solar years. It means that, the age of 9 lunar years cannot be considered as the initiation of criminal responsibility for girls, but in case of committing a crime, the person is not subject to security and correctional Measures. This is while these actions are applied for boys committing the crime. This is against the former criminal law policy which discussed the same age of criminal responsibility for girls and boys, and it seems that this discrimination is in favor of girls.

The second age range considered for grading the criminal responsibility is 12-15 years old. Article 88, considers two of five measures for the juveniles at the age of 12-15 years old including the written notification and detention in Correction and Rehabilitation Center (paragraphs d and e). On the other hand, some measures have been taken into account for this age range for the ta'zir punishment. According to the article 88, if a youth, at the age of 12-15 years old, commits a 1-5 degree of tazir crime (minor crimes), he/she should be detained in Correction and Rehabilitation Center for 3 months to 1 year. However, if the crime is in sixth or eighth degree, the youth is handed over to his/her parents, gets admonished by the judge, and receives notification or written commitment. However, the same problem is observed here. That is, the girls between 12 to 15 solar years are considered as mature while the boys at the same age are considered mature if only they are in full 15 solar years old. Therefore, the girls are subject to the reduced criminal responsibility, but boys are considered as children and are subject to supportive actions. According to this act, only the boys at the age of 15 lunar and solar years old are subject to the reduced criminal responsibility.

Finally, the young people at the age of 15 to 18 are the latest age group subject to the reduced criminal responsibility. In article 89, the word "punishment" has been used for the young people at this age range while for those in lower age range; the measures are more social and supportive. The punishments based on article 89 include:

Detention in Correction and Rehabilitation Center from two to five years in the case of offenses punishable in law by a ta'zir punishment of the first to third degree. Detention in Correction and Rehabilitation Center from one to three years in the case of offenses punishable in law by a ta'zir punishment of the fourth degree.

Detention in Correction and Rehabilitation Center from three months to one year or a fine of ten million (10,000,000) Rials to forty million (40,000,000) Rials or providing one hundred and eighty to seven hundred and twenty hours of unpaid public services in the case of offenses punishable in law by a ta'zir punishment of the fifth degree.

A fine of one million (1,000,000) Rials to ten million (10,000,000) Rials or providing sixty to one hundred and eighty hours of unpaid public services in the case of offenses punishable in law by a ta'zir punishment of the sixth degree.

A fine of up to one million (1,000,000) Rials in the case of offenses punishable in law by a ta'zir punishment of the seventh and eighth degree.

Note 1- Hours of providing public services shall not exceed four hours a day.

Note 2- Considering the accused person's condition and the crime committed, the court, at its discretion, instead of sentencing him/her to detention or a fine prescribed in paragraphs (a) to (c) of this article, can order the offender to stay at home in specific hours determined by the court or detention in the Correction and Rehabilitation Center in the weekend for three months to five years.

In addition, article 90 states that: "The court can review its decision for once according to the reports received about the condition of the child or youth and his/her behavior in Correction and Rehabilitation Center and may reduce the detention term up to one third or replace the detention with handing over the child or youth to his/her natural or legal guardians."

According to the article 91, "In the cases of offenses punishable by hadd or qisas, if mature people under eighteen years do not realize the nature of the crime committed or its prohibition, or of there is uncertainty about their full mental development, according to their age, they shall be sentenced to the prescribed punishments."

Note- The court may ask the opinion of forensic medicine or resort to any other method that it sees appropriate in order to establish the full mental development.

Article 92 says: "In the case of offenses punishable by diya any payment of other types of financial damages, the Children and Young People Court shall make decisions according to the provision relating to diya and damages."

Article 93 states: "If it recognizes mitigating factors, the court can reduce the punishments up to half of the minimum punishment provided and replace security and correctional measures for children and young people with another measure."

According to Article 94, "In the case of all ta'zir crimes committed by young people, the court can postpone the deliverance of the judgment, or suspend the execution of the punishment." and finally, based on Article 95, "Criminal convictions of children and young offenders shall have no effect in criminal records." (Islamic Penal Code Act, 2013)

According to this act, the legislator prevents the heavy and violent sanctions and considering five decisions in article 88, lets the judge to issue the verdict based on the offender's age. These paragraphs are accompanied with correctional, supportive and rehabilitation of the children and young people which are in the primary stages of criminal behavior. In fact, the legislator has assumed that by taking quick and strict measures toward the criminal behaviors of the children and young people, one cannot prevent the recommission of the crime. Further, there would be no place for criminal acts. The banning of Hadd or qisas (punishment and retaliation) was followed by the

banning of execution in new international codes. In addition to these cases, it is stated in article 95 that the existence of numerous decisions and their repetition has no effect on criminal records of the young people. For this reason, the criminal conviction of youth has no criminal record. Article 128 also states that the principle of the repeated criminal behavior does not apply for the young people. All these cases indicate supportive and corrective measures for these age groups.

According to this act, there is not difference between boys and girls for the individuals between the ages of 15 to 18 solar years who commit the ta'zir crimes. Some believe that, this is problematic. That is, it indicates that the individuals under 18, whether girl or boy, do not have complete criminal responsibility in contrast to jurisprudence and legal principles and further girls offenders are more exposed to the correctional measures compared to the boys. This policy can be considered as unacceptable and extremist.

However, there have been some objections to this act. For example, the new act, the articles 88 to 95 of which are devoted to the correctional measures, not only has considered the young people subject to the youth's rules and reduced criminal responsibility for them, but the article 146 only considered the non-mature children with no criminal responsibility which is a clear conflict in the articles of an Act.

In addition, the act has differentiated between the ages and various crimes and this establishment of different bases does not seem proper. Although the punishments are determined by the judge but the age of criminal responsibility should not be disturbed and there should be no discrimination between the crimes. On the other hand, the legislator has made no distinction between the ta'zir punishment and Hadd or qisas . Consequently, in all the crimes committed by the youth of 12 to 15 years old, only paragraphs D and E can be applied. On the other hand, in the offenses subject to Hadd or qisas (punishment and retaliation committed by children under 12, the measures in paragraphs A to C are taken. Therefore, the mature girl at the age of 9-12 years old who committed the crimes subject to Hadd or qisas is not subject to these measures but the Hadd or qisas are applied for the boys at the same age range. However, taking Hadd or qisas measures for the girls under 15 should be taken into consideration. The boy who has just reached the age of 15 has the criminal responsibility, but girls until 15 years of lod, use the boys' non-maturity exemptions. The legislator in Article 91 has also put some postern for the criminals. The capacity of legal discretion is recognized by the coroner and there is no criteria to measure it, since some believe that there is the possibility of doubt in the capacity of legal discretion of newly matured boys, but there should be no doubt in the capacity of legal discretion for the girls of 9-15 years old because they use the exemptions. Some scholars believe that this is an extremist policy and each person reach puberty based on his/her physiological and physical condition which differs in case of male and female, and it is not acceptable to compare them with each other .

CONCLUSION

There have been significant differences between the IPC of 2013 of Iran compared to the previous codes regarding the age of criminal responsibility. The legislator's purpose in enacting such codes was to provide a security and correctional measures acceptable for the community. These rules point to the inability and vulnerability of the young people and considered the age criterion for punishments and correctional measures. So that, in addition to correction and treatment, the next offenses have also been prevented and proper space is provided for returning to the society and having correct training. The new act, has considered the age of 9 lunar years for girls and 15 lunar years for boys as the age of criminal responsibility same as the previous acts. However, the gradation of criminal responsibility and accordingly the application of the rules, has considered three age groups of 9-12, 12-15 and 15-18 years old.

It can be said that these solutions for addressing the youth crimes are common in most countries all over the world so that one of the common international principles is to determine the least age of criminal responsibility for the young people. Countries of the world considered various age of criminal responsibility based on their social condition and

growth index. Today, most of the countries in the world have different age of criminal responsibility and absolute liability. Further different approaches have been taken for the range of these two types of ages which has been reduced compared to the criminal responsibility of adults. These measures are is gradual and evolutionary according to the child's growth. It can be said that IPC of 2013 is a positive movement toward the alignment with other countries of the world in the area of youth rights.

However, new laws, while having positive points, have also aroused some criticism. In the new Islamic Penal Code, there is again ambiguity and disagreement on the age of criminal responsibility of young people, and no single criterion is considered in how to react to the youth criminal behavior. It means that, different age ranges have been considered and based on this categorization, the criminal responsibility and correctional measures have been determined; but about youth delinquency in different ages regardless of the offenders' gender, the reactions are same, and it is not clear whether the age of criminal responsibility differs in boys and girls or not. That's why some believe that this rules are discriminatory and in favor of girls.

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Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Evaluation of Environmental Indices Affecting the City and Citizens of Tehran District No. 5 by using SWOT Analytical Model

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Received: 18 Mar 2015 Revised: 21 Apr 2015 Accepted: 24 May 2015

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ABSTRACT

The purpose of this study is to investigate the stability of indices in the field of water pollution, and traffic and transportation problem due to the indiscriminate increase of population in District 5 in Tehran. The concept of sustainable development represents the development that is balanced, and Justice-oriented. To evaluate the environmental indices affecting the biological quality of city and citizens in District 5 in Tehran and based on the field studies and data analysis through the SWOT technique that is a tetragonal model, at first internal factors (strengths and weaknesses) and then external factors (opportunities, threats) were studied. During two weeks questionnaires were completed by local authorities and people and were analyzed based on the SWOT technique model. Based on this analysis the existence of public transportation such as metro, BRT Buses and taxis and etc. with a weighted score of 0.616 is considered as the most important strengths, unwillingness of some municipal managers to change administrative structure with a weighted score of 0.375 is considered as the most important weakness, and local attention to the urban integrated management in recent years with a weighted score of 0.63 is the most important opportunity. Furthermore, the most important threat with a weighted score of 0.45 is to have more than two hundred thousand housing and commercially constructional units in the area most of which commercially evident. The results show that the most important environmental indices affecting citizens in the area have been water pollution, transportation and traffic, which have influence on the biological quality of the city and citizens of this region.

Key words: Sustainable development, Quality of life, District 5 of Tehran, SWOT analytical model

INTRODUCTION

In recent years, increasing growth of urbanization, especially in developing countries, has caused rapid changes in the development process and in the growth of urban population. These are changes that need conscious and technical management (Unpublished reports Department of the Environment, Tehran, 1393). The cities are a part of human civilization element and its objective symbol. The process of transformational changes in many aspects of human society has caused the city to welcome the extensive developments with a tremendous pace during the last decade. These transformations have also influenced the development of various changes in the city scope and has created new trend of metropolises development in recent decades (Ruffian et al., 1389). Fu believes that quality of life has to do with two sets of objective and subjective indices. Subjective indices are derived through the measuring of perceptions, assessments and citizen satisfaction from urban living environment, while objective indices are related to observable facts which in many cases are extractable within the framework of secondary data. Depending on the level of quality of life which should be measured, the objective or subjective indices are used (Fickett, 1990). Over the last hundred years, the city has attracted a large percentage of the world's population. For the first time in the history of mankind the number of people residing in cities has reached to the number of those living outside the cities. The UN forecast estimates that by 2030 more than 60 percent of the world's population will live in urban areas. In order to achieve sustainable prosperity people need to find new ways to provide their demands and match the production and consumption patterns to provide resources needed for future generations to live sustainably (Pourahmad et al., 1390).To build a better future the 1970s introduces the concept of sustainable development in three important economic, social and environmental dimensions. In contrast however, cities have shown the increase use of resources and rapid population growth. Since the mega cities are the main consumers of natural resources and goods, they should be designed and managed in such a way to use these commodities in a sustainable way. One of the most controversial concepts in urban sustainability is the issue of urban uncontrolled expansion due to environmental problems (Nielson et al., 1995). Sustainability starts with all of us and therefore it means our actions, behaviors and personal values. Modern society has almost completely forgotten the relationship and spiritual bounds that exists between us and the nature thus it will suffer in generations to come (Serrajedin et al., 2000).

MATERIALS AND METHODS

The study area

Municipality District No. 5 is located in Tehran northwest in east longitude of 51 degrees, 17 minutes and 30 seconds to 51 degrees 19 minutes 56 seconds and north latitude from 35 degrees 41 minutes and 59 seconds in an area of 5901.1220 hectares. This District is located in the neighborhood of District No. 2 from east, in the vicinity of District No. 9 from the south and in the neighborhood of districts No. 21 and 22 of municipality from West. District 5 of Tehran municipality is divided into 7 districts based on the internal divisions (Department of green space and Municipal Utilities District no. 5, 1393) which for example, the area of two District No. 5 and 7 are as follows:

District (5): is located in the East Zone. It reaches from the north to Resalat Highway, from the south to Tehran-Karaj Highway, from West to Shahid Sattari Highway (Southern Noor) and from East to Shahid Ashrafi Esfahani and Mohammad Ali Jinnah Highway.

District (7): is located in the center of area and it reaches from the north to the North area Highlands (contour line of 1800 m), from the south to Ayatollah Kashani Highway, from the West to Masil and Sak-Hesarak and from East to Shahid Sattari Highway (Western limit of District No. 3) (1991, Rathje). Climatic conditions of Tehran District No. 5 which cover a range from the West of Tehran are as follows:

Climate of District No. 5 of Tehran Municipality is often influenced from north by Mediterranean fronts from West and North-West of Siberia. Sometimes it affects by the warm and desert fronts of Saudi Arabia (Iran Meteorological Organization, 1393).

METHODOLOGY

In order to analyze the information the SWOT analytical model was applied which is a 4-dimensional matrix a common term used to identify strengths, internal weaknesses, opportunities and external threats and in this way for each of these factors, 8 parameters and in line with these parameters, questions with respect to the work title in two types of general and specialized questionnaire, were prepared and used. Statistical population in this study consists of two groups of people in which from the Cochran sampling method, the number of 384 persons for residents and 45 persons for professionals and officials have been selected as sample size. The general questionnaires were distributed among residents in the area and specialized questionnaire were distributed among authorities and experts. Thus; according to the study title, interviews were done which at the beginning of questionnaire distribution, 20 general and specialized questionnaires as the pretest were randomly distributed among people. Then, questionnaires were completed and collected so that by using Cronbach's alpha formula, the validity and reliability of questionnaires were obtained. Final analysis was conducted using SPSS software and t-test (one-sample t test) which Kolmogorov-Smirnov test was used to test the normality of data. In the case of quantitative variables the normality of the data should first be tested and in case of normality of data, the one-sample t-test and in case of abnormality of data, the Wilcoxon nonparametric test should be used. In this study, because of normality, the student t-parametric method (one-sample t-test) was used; eventually these indicators were detected and by providing appropriate guidelines and strategies it has been tried to increase the strengths and opportunity factors and reduce the weaknesses and threats.

Based on the following tables in Tehran District No. 5, seven internal strengths against seven internal weaknesses and also six external opportunities against seven external threats have been identified and evaluated. This information has been provided for authorities in order to prioritize and then the information and data were collected and weighed so that weighted score was finally obtained.

According to the above table weighted score has been added to the final coefficient and thus the final coefficient for this section is 3.293, while the mean final score is at 2.5.This means that as the final score gets closer to the numerical value of 4 the applied strategies are more appropriate and even close to perfection. Since our strategies are much closer to the perfect value we can claim that for our internal strength factors, we must use offensive strategies. This means that in regard to the opportunities available, we must be able to increase our strength points as follows:

A: identification of citizen's environmental cognition level in context of reduction of environmental problems.
B: identification and utilization of experts in the field of environmental sciences.
C: Maximize the utilization of information and communication technology in realization of area integrated management goals
D: Developing an indigenous pattern of area integrated and sustainable management in the environment section.
E: Promotion of public transportation systems such as metro, and BRT.
F: Establishment of NGOs to promote environmental quality and make reform on consumption pattern.

Here the weighted score has been added to the final coefficient and thus the final coefficient for this section is 2.785, while the mean final score is at 2.5.This means that as the final score gets closer to the numerical value of 4 the applied strategies are more appropriate and even close to perfection. Since our strategies are much closer to the perfect value, it can be claimed that for our internal weakness factors, we must use defensive strategies. This means that in regard to threats at hand, we must be able to decrease our weakness point as follows:

Defensive strategies (WT)

A: Special attention must be given to the NGOs in order to achieve the objectives of regional management.
B: Neighborhood institutions must require weight in decision making of the Regional Environmental Management.
C: The proportion of housing increase rates as opposed to the rates of rent reductions must be balanced.

D: Clarification of the duties and authorities of managers to realize the goals of regional management in the environmental sector should be carried out.
E: Encourage people to support and participate in the process of developing regional programs for environmental purposes.

According to the above table weighted score has been added to the final coefficient and thus the final coefficient for this section is 2.356, while the mean final score is at 2.5.This means that as the final score gets closer to the numerical value of 4 the applied strategies are more appropriate and even close to perfection. Since our strategies are much closer to the perfect value, it can be claimed that for our internal strengths factors, we must use adaptive-competitive strategies. This means that in regard to opportunities available we must be able to decrease our weakness points as follows:

Adaptive-competitive strategies (WO)

A: Creating a Comprehensive Databank of the region municipality with the possibility of extended use for all users involved with urban environment management issues.
B: The use of international experience in clarification of the duties and authorities of regional managers.
C: Building appropriate capacity and context to promote the adoption level of integrated plan by managers.
D: Applying the tools necessary to implement the decisions of previous managers and not wasting power and capital in this field.
E: Preventing the indiscriminate increase of population by utilizing the appropriate technology to control environmental problems.

According to the above table weighted score has been added to the final coefficient and thus the final coefficient for this section is 3.293, while the mean final score is at 2.5.This means that as the final score gets closer to the numerical value of 4 the applied strategies are more appropriate and even close to perfection. Since our strategies are much closer to the perfect value we can claim that for our internal strength factors, we must use conservative strategy. This means that in regard to threats present, we must be able to increase our strength points as follows:

Conservative strategy (ST)

A: Officials must pay attention to the placement of unstable faults in the area and prevent non-normative construction.
B: Utilization of public participation in solving environmental issues and problems.
C: Creating opportunities for culture promotion with an emphasis on education and research capabilities in the region.
D: Special attention of District 5 municipality to solve the environmental problems due to the resistance of some independent institutions and organizations against any change and integration.
E: Increase educational and research facilities in the region by reduction of residential and commercial units.

As can be seen in the following matrix, the weighted score of strengths is more than weaknesses and the weighted score of threats is more than opportunities, thus the traced shape is widened and inclined towards the conservative strategies and the officials should try to take advantage of the strengths and threats and take steps towards these strategies.

DISCUSSION

This study was conducted to investigate the environmental indices affecting the city and citizens of District 5 in Tehran with the SWOT analytical model. SWOT analytical model was used to determine strengths, weaknesses,

opportunities and threats in the study area and the research findings were distributed between the two groups of people (officials, residents) in the area in the form of questionnaires and were finally analyzed. The questionnaires were as follows:

Fifty percent of the respondents are male and the rest are females with 68% of which married and 28.4% high school diploma. Of these people 29.4% are between 28-37 years of age and 46.4% are self-employed of which 33.9% have income range of 7500000 to 10000000 Rial. The main strength factor of Tehran District 5 is the existence of public transportation systems such as Metro, BRT, bus, taxi, van, bike with the highest percentage. The lowest strength factor is the resident's lack of environmental awareness and their poor attitude towards urban environment.

The main weakness is the unwillingness of some municipal managers to change the management structure in the region with the highest weighted score. The lowest weighted score is dedicated to the influence and use of personal decisions and choices of local managers in solving environmental issues. The most important opportunity factor is the regional attention to urban integrated management in recent years which has the highest weighted score and the lowest percentage is allocated to the possibility of benefit from the experiences of the said countries to cooperate with us in solving critical environmental issues. Finally, the most important threat is having more than 200,000 residential and construction units in this region with most commercially evident and with the highest weighted score in the region. The role of natural constraints on the lack of realization of the Regional Environmental Management goals has the lowest weighted score from the threats.

CONCLUSION

Based on the results obtained from four mentioned tables in the text, most important influential factors were identified and listed. These factors have serious negative impacts on the quality of life of residents of Tehran's district 5. Based on the Evaluation Matrix Diagram of Strategic Position and Action, it has been observed that among different strategies studied, the figure has been drawn towards the conservative strategy. This is due to the fact that weighted scores for points of strength and threat are higher than same scores for other points of interest. Thus, it is to the advantage of residents of this district to be able to decrease the points of threats and at the same time increase the points of strength in hope for a sustainable city and better quality of life. This can be achieved through enhancement of our knowledge of environmental awareness, gradual willingness of the local conservative managers to stop resisting constructive changes and at the same time be able to integrate all the managerial means and tools available to solve most important local and regional environmental issues and gradual change of our attitudes towards nature to become environmentally friendly urban residents.

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Figure 1: A view of Tehran District 5

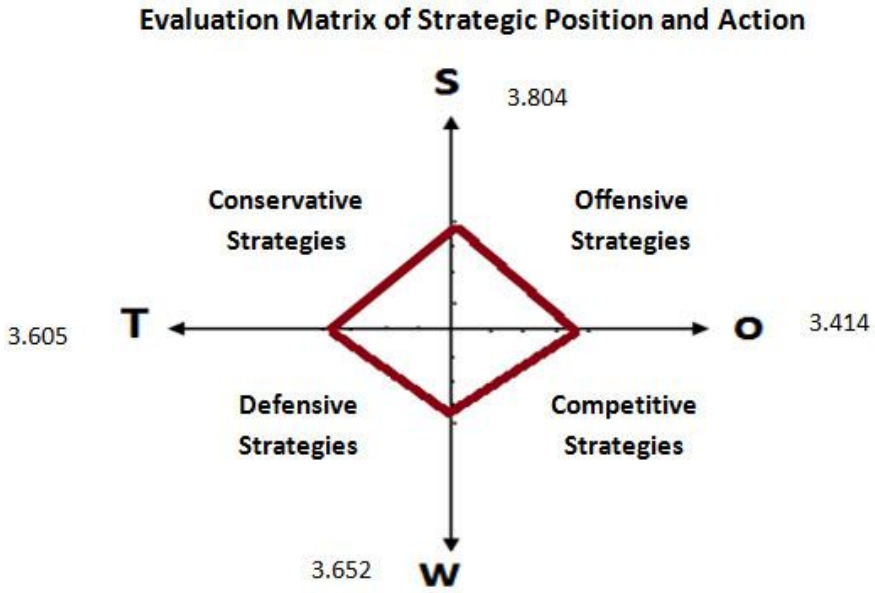

Table 1. Sampling Process in the Study

Statistical population	The total number	Sampling method	Number of samples
Residing households	875493	Cochran formula	384
Officials	45	--------	45

Table 2. Weighting and Ranking of the Internal Factors (Strengths)

	Strengths	Primary coefficient	Secondary coefficient (weight)	Rank	Weighted Score (Final coefficient)
S1	Benefits from technical experts on environmental issues in this area.	141	0.139	4	0.556
S2	Special attention to Tehran Municipality District No. 5 to address environmental issues	137	0.135	4	0.405
S3	Establishment of an integrated management system for environmental management in the District No. 5	140	0.138	3	0.414
S4	Increase the people's desires and requests to solve environmental issues and problems	153	0.151	3	0.453
S5	High levels of environmental cognition among local people of this district.	133	0.131	3	0.393
S6	The position of this district to benefit from educational and research facilities with literacy rate of 96% and above.	154	0.152	3	0.456
S7	Availability of different public transportation systems such as BRT buses and taxies.	156	0.154	4	0.616
Total		1014	1		3.293

Table 3. Weighting and Ranking of the Internal Factors (Weakness)

	Weaknesses	Primary coefficient	Secondary coefficient (weight)	Rank	Weighted Score
W1	The lack of comprehensive data bank in the District Municipality.	119	0.092	3	0.276
W2	Lack of clarity in defining the duties and authorities of directors.	137	0.106	3	0.318
W3	Lack of having proper public support for existing programs because of the people	141	0.109	2	0.218

	low participation in the process of strategic plans				
W4	Indiscriminate increase of population in this District and consequently, the pressure on quality and scarcity of water and water and air pollution..	151	0.117	3	0.351
W5	Housing shortages and rising rents in this District due to the population increase.	154	0.119	3	0.357
W6	Manipulation and the use of personal choices of managers in solving regional environmental problems.	137	0.106	2	0.212
W7	Numerous appointments and dismissals in district management and failure to fulfill the previous management programs.	149	0.115	3	0.345
W8	Unwillingness of some municipal leaders to change the existing management structure.	162	0.125	3	0.375
W9	Lack of appropriate information in the involved sectors of urban management.	143	0.111	3	0.333
Total		1293	1		2.785

Table 4. Weighting and Ranking of External Factors (Opportunities)

	Opportunities	**Primary coefficient**	**Secondary coefficient (weight)**	**Rank**	**Weighted Score**
O1	Global attention to urban integrated management in recent years.	149	0.201	3	0.603
O2	Improve the environmental position at global scale in urban planning process design.	126	0.170	2	0.034
O3	Possibility to benefit from the experiences of world countries in realization of integrated management of urban and regional environment	114	0.154	2	0.308
O4	Existence of national commitment to reform consumption pattern and saving sources and use of renewable energy	118	0.159	2	0.318
O5	The tendency of the region towards the proper utilization of communication	116	0.157	3	0.471

	technology in reduction of regional environmental problems.				
O6	Implementation of meaningful subsidies plan that leads to control the consumption of resources and energy	117	0.158	2	0.316
Total		740	1		2.356

Table 5. Weighting and Ranking of External Factors (Threats)

	Threats	Primary coefficient	Secondary coefficient (weight)	Rank	Weighted Score
T1	Attitudes based on industrial development priority over environmental protection at the level of some country managers	140	0.140	3	0.042
T2	Resistance of some independent institutions and organizations against any integration and change.	147	0.147	3	0.441
T3	The role of natural constraints on non-fulfillment of urban management in environment sector.	136	0.136	2	0.272
T4	Lack of having regional infrastructure in proportion to the size of population in the area.	137	0.137	2	0.274
T5	Impact of government decisions and macro policies on regional management	146	0.146	3	0.438
T6	Having more than 200 thousand housing and construction units in the area most of which are commercially evident.	150	0.150	3	0.45
T7	The existence of unstable faults in the region and its negative impacts during natural disasters.	145	0.145	3	0.435
Total		1001	1		2.73

Indian Journal Of Natural Sciences *www.tnsroindia.org. © IJONS*

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Optimization of Seed Surface Sterilization Technique and *In vitro* Seed Germination of Medicinally Important Herb-*Silybum marianum* (L.) Gaertn.

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Received: 15 Mar 2015 Revised: 19 Apr 2015 Accepted: 20 May 2015

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ABSTRACT

Silybum marianum (L.) Gaertn is a member of the Compositaea family, and commonly known as Milk thistle. It is an annual or biennial plant native to the Mediterranean, but now widespread throughout the world. A successful and efficient method for seed surface sterilization and in vitro seed germination of S. marianum has been established in this study. ANOVA results indicated that the effect of sterilizing agents treatments were found to be significant ($p \leq 0.05$) in all measured trials viz., NDFG (number of days of first germination), GP (germination percentage), MGT (mean germination time), GR (germination rate) and CP (contamination percentage). The maximum GP (90.67%) was observed in control (sterilized distilled water, 20 min) and less GP(53.33%) was observed with 0.3% mercuric chloride, 7 min. Whereas among subjected surface sterilization methods, the highest CP was found in control and the lowest was achieved by 4% Sodium Hypochlorite for 10 min, 0.3% mercuric chloride for 7 min and 4% Sodium Hypochlorite for 5 min. By using ANOVA test it was revealed that the effect of concentration of minerals and sucrose were significant ($p \leq 0.05$) on in vitro seed germination MGT, GR, GP, and NDFG by using different types of media. The maximum GP were achieved by mineral water medium and the minimum one was observed in MS agar medium with 3% sucrose.

INTRODUCTION

The species *Silybum marianum* (L.) Gaertn is a member of the Compositaea family, and commonly known as Milk thistle.The extracts of the fruits are used for oral treatment of toxic liver damage and for therapy of chronic inflammatory liver disease and liver cirrhosis (1). Silymarin extracted from fruits of the species *S.marianum* contains mixture of silybin, isosilybin, silydianin, silycristin and taxifolin. Silymarin is used as the therapy for liver disease (2). Currently, all commercially available silymarin is obtained from intact fruits of wild plants. The increasing worldwide demand for silymarin is endangering the sparse populations of *S.marianum* (3). Hence there is need to conserve the species by using in vitro culture technology. In vitro culture technology the surface contaminants are to be removed. Contamination with different bacterial and fungal organisms is considered to be the most important reason for losing in vitro plant cultures (4). In spite of the best selection of sterilizing agents and exposure time, it is almost impossible to eliminate contamination from in vitro grown plants and takes time for standardizing the sterilization procedures (5). During seed surface sterilization, seeds should not lose their biological activity and only contaminants should be removed. Therefore seeds are to be surface sterilized only by sterilizing agents at suitable concentration for a specific period (6). Not only optimization of sterilization method but also sucrose concentration in the medium play arole in tissue cultures. Regulating of photosynthesis and respiration, serving as storage compound and helping to maintain the osmotic pressure in the cytosol are some of important sucrose functions in the cytosol (7). Sucrose also functions as an important signaling molecule in the regulation of germination and seedling development (8). Effect of sucrose in culture media on seed germination and seedling development were reported in different plants (9-11). So far, there are no reports on optimization of seed surface sterilization technique and effect of different types of media on in vitro seed germination in *S. marianum*. Hence, in this study we have attempted to optimize seed sterilization methods and also on in vitro seed germination.

MATERIALS AND METHODS

Plant material

Seeds of *S. marianum* were collected from the Institute of Medicinal Plants, Iranian Academic Center for Education, Culture and Research (ACECR), Tehran, Iran.

Seeds sterilization methods

In this experiment two types of seeds were used, seeds with thin rim (a remnant of the floral parts) and seeds without rim (Fig. 1a), and subjected them for seed germination trials. To investigate the suitable seed surface sterilization method in *S. marianum*, an experiment was arranged on Randomized Complete Block Design (RCBD). The following sterilizing agents with different concentrations and exposure timing were used:

i) sterilized distilled water for 20 min (control); _
ii) Mercuric chloride ($HgCl_2$) 0.1%, 0.2% and 0.3% (w/v) for 1, 3, 5, and 7 min; _
iii) Ethanol 70% + 100 µL tween- 20 for 5 and 10 min, and _
iv) Sodium hypochlorite 4% (w/v) solution for 5 and 10 min (see Table 1).

Sterilized seeds were placed on Whatman No.1 filter paper moistened with mineral water (paper boat method) for germination (Fig. 1b). The cultures were kept in culture room at 25±2 °C under a 16h photoperiod with a light intensity of ~ 40 µmol m^{-2} s^{-1} provided by cool- white fluorescent tube lights.

Optimization of seeds germination medium

For optimization of seeds germination medium in *S. marianum*, an experiment was arranged on Randomized Complete Block Design (RCBD) to investigate the effect of different types media without and with different concentration of the sucrose on seed germination and seedling development. For the seed germination, the seeds were sterilized with 4% (w/v) sodium hypochlorite for 5 min, followed by rinsing in sterilized water for 5 minutes were transferred into culture tubes (with paper boats) containing the following type of medium individually:

1- Mineral water (kinley company, India);
2- Distilled water;
3- MS medium without sucrose
4- MS medium +1% (w/v) sucrose;
5- MS medium +2% (w/v) sucrose;
6- MS medium +3% (w/v) sucrose;
7- MS medium + 3% (w/v) sucrose + 0.8% (w/v) Agar-Agar;
8- MS medium without sucrose + 0.8% (w/v) Agar-Agar.

The medium was autoclaved at 121°C under 15 psi pressure for 15-20 min. All the cultures were placed in culture room at 25±2 °C under a 16h photoperiod with a light intensity of ~ 40 µmol m^{-2} s^{-1} provided by cool- white fluorescent tube lights.

Data analysis

For each treatment twenty five seeds were used and each experiment was repeated at least thrice. The percentage of germination (PG), mean germination time (MGT), germination rate (GR) and percentage of contamination (PC) and number of days for germination (NDFG) were recorded for every 15 days. At first, normality test of raw data was done using IBM SPSS software version 20. The ANOVA analysis was performed and means comparison analysis was achieved using Duncan's multiple range test ($P \leq 0.05$). Calculation of the percentage of germination, mean germination time, germination rate and percentage of contamination have done as described by Ellis and Roberts (12) and Talei et al. (13) as follows:

For calculating of mean germination time:

$$MGT = \Sigma D.N / n$$

Where; "N" is the number of germinated seeds in the certain counting day, "n" is the total number of grown seeds and "D" is the number of certain day in each counting were used.

The germination and contamination percentage (GP and CP) were recorded after fifteen days.

The germination rate for each experimented method was calculated by following formula:

GR= No. of germinated seeds / days to first count +…+ No. of germinated seeds / Days to final count

Seedlings developed in same period of time (fifteen days old) were selected to measure the length of roots and shoots. Calculation of the percentage of germination, mean germination time, germination rate and percentage of contamination has done as per the formulae.

RESULTS AND DISCUSSION

Optimization of seeds surface sterilization:

For optimization of seeds surface sterilization technique in *S. marianum* different types of methods are used (see Table 1)Similar types of results were observed in both types of seeds used viz., without and with thin rim part, except CP (Figure 1). Hence in the present investigation, the results of seeds with rim are presented. The maximum (90.67%) seed germination percentage (GP) was observed in control (sterilized distilled water, 20 min) in comparison to less percentage (58.67%) of GP at 4% (w/v) sodium hypochlorite. Among subjected surface sterilization methods, the maximum contamination percentage was recorded in control. While lowest CP was achieved by 4% (w/v) sodium hypochlorite for 5 and 10 min. By comparison of mean contamination percentage of seeds with thin rim and without thin rim were subjected to different sterilization methods, it was revealed that the decreased effect was found on contamination percentage without affecting other seed germination values. ANOVA results indicated that the effect of treatments were significant ($p \leq 0.05$) in all measured trials viz. NDFG, GP, MGT, AGP, GR and CP (Table 1). The correlation were significant and positive between [germination percentage and contamination percentage - germination rate], [contamination percentage - germination percentage], [number of days of first germination - mean germination time] and correlation were significant and negative between [GR, GP - MGT] and [GR, GP, CP - NDFG] (Table 2).

Effect of different types of media on seed germination

For in vitro seed germination, the sterilized seeds of *S. marianum* were inoculated on different types of media (Table 3). Maximum percentage of seed germination was observed in sterilized mineral water. Average mean seedling length was also found highest in the same medium. Early germination of seeds was found in the same medium whereas lowest percentage of seed germination was recorded on MS medium containing 3% sucrose and also on MS + 3% sucrose + Agar (Table 3). By using ANOVA test it was revealed that effect of concentration of minerals and sucrose were significant ($p \leq 0.05$) on MGT, GR, GP, and NDFG and AGP. Moreover, the effect of media composition on length of shoot and length of root were also significant ($p \leq 0.05$) (Table 3, Figs 2-3). Not only in the case of GP but also in other measured seed germination trials (except AGP) mineral water was found to be the best medium for seed germination in S. marianum. The correlation was significantly positive among MGT - AGP - NDFG and GP - GR. Also correlation was significant and negative between GR - MGT, AGP - GR, GP - MGT, GP - AGP, NDFG - GR, and NDFG - GP (Table 4). It has been reported that high concentration of glucose resulted in seedling developmental arrest in higher plants (14). Moreover, glucose, as degraded product of sucrose, increases the accumulation of ABA and consequently delay in seed germination. Like glucose, high concentration of sucrose in medium also inhibited seedlings development seriously in Arabidopsis (15). Our experiment revealed that the presence of sucrose also repressed the development of seedlings. As the concentration of sucrose increased, the size of roots and shoots were decreased. In addition, solidification of MS medium with agar also caused a delay of seed germination and seedlings development similar to sucrose (Fig. 1c).

CONCLUSION

A successful and efficient system for seed surface sterilization, seed germination has been established in the present study.Based on our experiments, it was observed that the efficient technique for seed surface sterilization in S. marianum was found that 4% (w/v) sodium hypochlorite for 5 min. Also all other different sterilization methods examined had found significant effect ($p \leq 0.05$) on all measured seed germination trials. The concentration of sterilizing agents as well as duration time had negative effect on seed germination properties in *S. marianum*. It was also observed the harmful effect of high percentage of ethanol, sodium hypochlorite and mercuric chloride on

embryo. By comparison of GP, MGT, AGP, GR, CP and NDFG, it was concluded that 4% sodium hypochlorite for 5 min is the best technique among others tried in *S. marianum* for seed surface sterilization. In addition, the effect of different types of media composition on seed germination and seedling development also investigated. As we expected, the concentration of sucrose had significant effect ($p \leq 0.05$) on both seed germination trials and seedling development negatively (Table 3). Moreover, solidification of MS medium with agar also had significant effect ($p \leq 0.05$) on NDFG, GP, MGT, length of shoot and length of root negatively. By comparison of ANOVA results of measured characteristics it may conclude that the best medium for seed germination and seedling development in *S. marianum* has been found to be sterilized mineral water.

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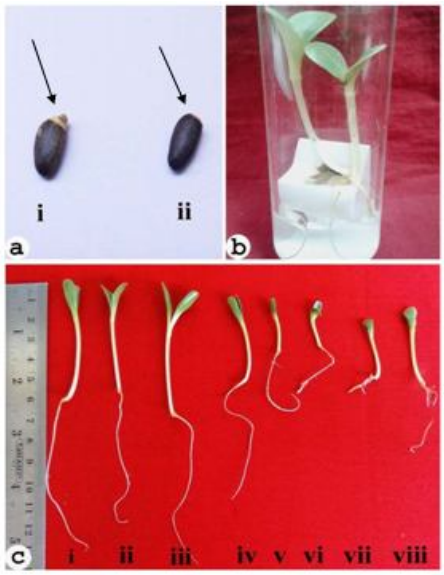

Figure-1: Seeds of *S.marianum* with (i) and without(ii) rim part (a), in vitro seed germination using paper boat technique (b), effect of different types of media on seedlings morphology; mineral water (i), distilled water (ii), MS medium without sucrose (iii), MS medium +1% (w/v) sucrose (iv), MS medium +2% (w/v) sucrose (v), MS medium +3% (w/v) sucrose (vi), MS medium + 3% (w/v) sucrose + 0.8% (w/v) Agar-Agar (vii), MS medium without sucrose + 0.8% (w/v) Agar-Agar (viii) (c).

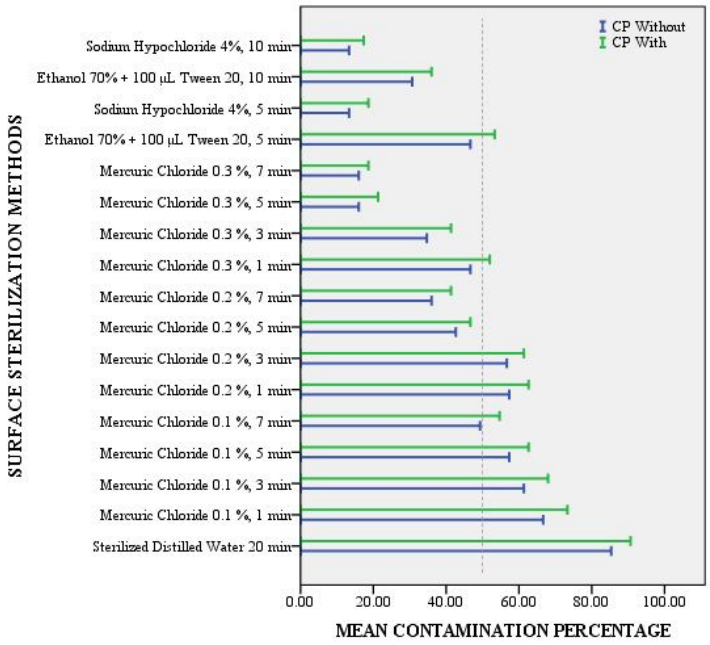

Figure – 2: Comparison of seed germination contamination percentage with or without thin rim part using different surface sterilization techniques in *S. marianum*.

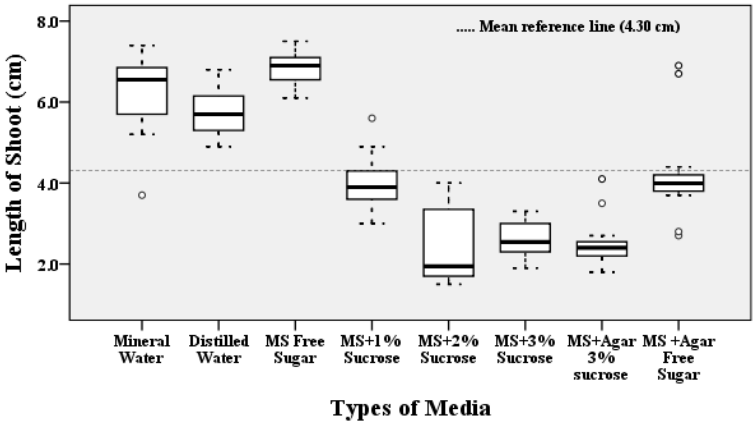

Figure-3: Effect of different types of media on shoot length of seedlings in *S. mariamum*.

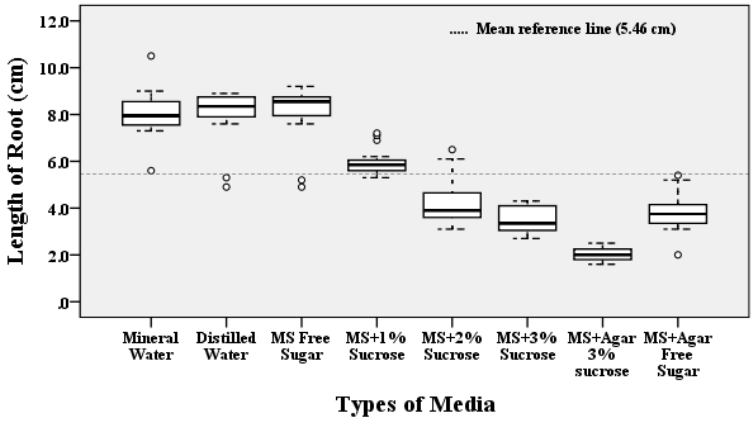

Figure- 4: Effect of different types of media on root length of seedlings in *S.mariamum*.

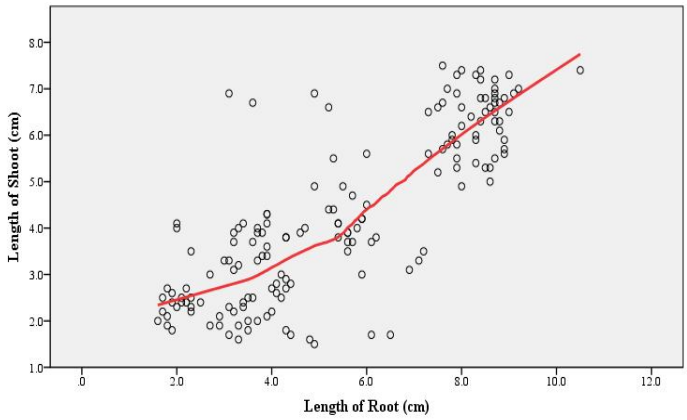

Figure-5: Scatterplot of correlation of length of shoots and roots grown in different types of medium in *S. marianum.* [Correlation between length of shoots and roots is significant at the 0.01 level (2- tailed) and positive (0.815)].

Table -1; Effect of different surface sterilization methods on measured characteristics in S. marianum

STERILIZATION METHODS	NDFG(±SE)[a]	GP(±SE)[a]	MGT(±SE)[a]	GR(±SE)[a]	CP(±SE)[a]
Sterilized Distilled Water, 20 min (control)	1.00±0.00[a]	90.67±1.33[a]	4.31±0.22[a]	7.71±0.19[a]	90.67±4.81[h]
Mercuric Chloride(0.1 %), 1 min	1.00±0.00[a]	80.00±2.31[b]	5.50±0.10[bcd]	6.28±0.04[c]	73.33±4.81[g]
Mercuric Chloride (0.1 %), 3 min	1.33±0.33[ab]	73.33±1.33[bc]	6.32±0.21[de]	4.98±0.12[def]	68.00±2.31[fg]
Mercuric Chloride (0.1 %), 5 min	1.33±0.33[ab]	68.00±2.31[cde]	6.10±0.22[de]	4.51±0.34[fgh]	62.67±3.53[ef]
Mercuric Chloride (0.1 %), 7 min	1.67±0.67[ab]	65.33±3.53[cdef]	6.24±0.41[de]	4.87±0.16[ef]	54.67±1.33[de]
Mercuric Chloride (0.2 %), 1 min	1.33±0.33[ab]	66.67±1.33[cdef]	6.63±0.39[e]	5.35±0.12[de]	62.67±5.33[ef]
Mercuric Chloride (0.2 %), 3 min	1.33±0.33[ab]	65.33±3.53[cdef]	6.09±0.16[de]	5.51±0.14[d]	61.33±1.33[ef]
Mercuric Chloride (0.2 %), 5 min	1.33±0.33[ab]	69.33±2.67[cd]	5.97±0.10[de]	5.00±0.23[def]	46.67±1.33[cd]
Mercuric Chloride (0.2 %), 7 min	1.67±0.33[ab]	60.00±2.31[efg]	6.00±0.25[de]	3.84±0.20[i]	41.33±1.33[bc]
Mercuric Chloride (0.3 %), 1 min	1.33±0.33[ab]	62.67±2.67[def]	6.34±0.13[de]	4.53±0.08[fgh]	52.00±2.31[d]
Mercuric Chloride (0.3 %), 3 min	1.67±0.33[ab]	60.00±2.31[efg]	5.68±0.24[cd]	4.69±0.19[fg]	41.33±1.33[bc]
Mercuric Chloride (0.3 %), 5 min	2.00±0.58[ab]	60.00±2.31[efg]	6.03±0.28[de]	4.03±0.12[hi]	21.33±1.33[a]
Mercuric Chloride (0.3 %), 7 min	2.33±0.33[b]	53.33±3.53[g]	6.68±0.11[e]	4.04±0.42[hi]	18.67±1.33[a]
Ethanol 70% + 100 µL Tween 20, 5 min	1.00±0.00[a]	78.67±3.53[b]	5.09±0.43[abc]	6.44±0.07[bc]	53.33±3.53[de]
Ethanol 70% + 100 µL Tween 20, 10 min	1.67±0.33[ab]	61.33±2.62[defg]	5.70±0.33[cd]	4.10±0.23[ghi]	36.00±2.31[b]
Sodium Hypochlorite (4%), 5 min	1.33±0.33[ab]	73.33±4.87[defg]	4.86±0.25[cd]	6.89±0.19[ghi]	18.67±2.67[b]
Sodium Hypochlorite (4%), 10 min	2.00±0.00[ab]	58.67±1.33[fg]	6.05±0.35[de]	4.61±0.12[fgh]	17.33±3.53[a]

Table-2: Phenotypic correlation coefficient of measured trials under different sterilization treatments in *S. marianum* .

	MGT	GR	GP	CP	NDFG
MGT	1				
GR	-0.787**	1			
GP	-0.741**	0.893**	1		
CP	-0.242	0.504*	0.724**	1	
NDFG	0.538*	-0.739**	-0.858**	-0.778**	1

** Correlation is significant at the 0.01 level (2- tailed).

* Correlation is significant at the 0.05 level (2- tailed).

Table-3: Effect of mineral, distilled water and MS medium with different concentrations of sucrose on in vitro seed germination in *S. marianum*.

	MGT	GR	AGP	GP	NDFG
MGT	1				
GR	-0.860**	1			
AGP	0.462*	-0.614**	1		
GP	-0.769**	0.927**	-0.677**	1	
NDFG	0.776**	-0.917**	0.725**	-0.936**	1

Means sharing the same letter within columns are not significantly different ($p \leq 0.05$) using Duncan's multiple range test.

[a] Mean ± Standard Error

Table- 4:Phenotypic correlation coefficient of measured trials under mineral, distilled water and MS medium without and with sucrose on in vitro seed germination in *S. marianum*.

MEDIA COMPOSITION	NDFG(±SE)[a]	GP(±SE)[a]	MGT(±SE)[a]	GR(±SE)[a]	Mean length of shoot (±SE)[a]	Mean length of root(±SE)[a]
Mineral Water	1.00±0.00[a]	82.67±3.53[a]	6.21±0.45[a]	5.44±0.10[a]	6.27±0.20[b]	8.04±0.21[a]
Distilled Water	1.67±0.33[ab]	74.67±4.81[ab]	7.19±0.20[ab]	3.99±0.40[b]	5.14±0.13[c]	8.07±0.24[a]
MS (Sugar free)	2.67±0.33[bc]	69.33±3.53[bc]	8.23±0.62[bc]	2.79±0.41[c]	6.86±0.08[a]	8.17±0.26[a]
MS (1% Sucrose)	5.00±0.58[d]	62.67±2.67[cd]	8.77±0.46[bcd]	2.07±0.14[c]	3.99±0.14[d]	5.94±0.12[b]
MS (2% Sucrose)	5.33±0.67[d]	58.67±2.67[d]	9.97±0.62[cd]	1.66±0.09[cd]	2.35±0.20[e]	4.20±0.20[c]
MS (3% Sucrose)	6.00±0.58[d]	56.00±4.00[d]	10.02±0.54[d]	1.53±0.19[d]	2.63±0.10[e]	3.46±0.12[d]
MS (3% Sucrose) + Agar	6.33±0.33[d]	56.00±2.31[d]	9.85±0.67[d]	1.55±0.16[d]	2.48±0.12[e]	2.02±0.06[e]
MS + Agar (Sugar free)	3.67±0.33[bc]	69.33±1.33[bc]	7.78±0.40[ab]	2.66±0.18[d]	4.16±0.22[d]	3.80±0.17[cd]

** Correlation is significant at the 0.01 level (2- tailed).

* Correlation is significant at the 0.05 level (2- tailed).

Indian Journal Of Natural Sciences *www.tnsroindia.org. © IJONS*

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Rhizospheric Microbes are Excellent Plant Growth Promoters

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Received: 15 Mar 2015 Revised: 23 Apr 2015 Accepted: 20 May 2015

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ABSTRACT

Plant growth promoting rhizobacteria are the soil bacteria inhabiting around the root surface and are directly or indirectly involved in promoting plant growth and development via production and secretion of various regulatory chemicals in the vicinity of rhizosphere. Generally, plant growth promoting rhizobacteria facilitate the plant growth directly by either assisting in resource acquisition (nitrogen, phosphorus and essential minerals) or modulating plant hormone levels, or indirectly by decreasing the inhibitory effects of various pathogens on plant growth and development in the forms of biocontrol agents. Various studies have documented the increased health and productivity of different plant species by the application of plant growth promoting rhizobacteria under both normal and stressed conditions. The plant-beneficial rhizobacteria may decrease the global dependence on hazardous agricultural chemicals which destabilize the agro-ecosystems. This review accentuates the perception of the rhizosphere and plant growth promoting rhizobacteria under the current perspectives. Further, explicit outlooks on the different mechanisms of rhizobacteria mediated plant growth promotion have been described in detail with the recent development and research. Finally, the latest paradigms of applicability of these beneficial rhizobacteria in different agro-ecosystems have been presented comprehensively under both normal and stress conditions to highlight the recent trends with the aim to develop future insights.

Key words: PGPR, Phosphate solubilization, biofilm, Indole acetic acid, ACC deaminase,

INTRODUCTION

Bacterial genera are vital components of soils. They are involved in various biotic activities of the soil ecosystem to make it dynamic for nutrient turn over and sustainable for crop production (Ahemad et al., 2009 and Chandler et al., 2008). They stimulate plant growth through mobilizing nutrients in soils, producing numerous plant growth regulators, protecting plants from phytopathogens by controlling or inhibiting them, improving soil structure and bioremediating the polluted soils by sequestering toxic heavy metal species and degrading xenobiotic compounds (like pesticides) (Ahemad, 2012). Indeed, the bacteria lodging around/in the plant roots (rhizobacteria) are more versatile in transforming, mobilizing, solubilizing the nutrients compared to those from bulk soils,Therefore, the rhizobacteria are the dominant deriving forces in recycling the soil nutrients and consequently, they are crucial for soil fertility (Glick, 2012). Currently, the biological approaches for improving crop production are gaining strong status among agronomists and environmentalists following integrated plant nutrient management system. In this context, there is an ongoing rigorous research worldwide with greater impetus to explore a wide range of rhizobacteria possessing novel traits like heavy metal detoxifying potentials (Ma et al., 2011), pesticide degradation/tolerance (Ahemad and Khan, 2012b), salinity tolerance (Tank and Saraf, 2010), biological control of phytopathogens and insects (Hayat et al., 2010) along with the normal plant growth promoting properties such as, phytohormone (Ahemad and Khan, 2012c), siderophore (Jahanian et al., 2012, Jeon et al., 2003 and Tian et al., 2009), 1-aminocyclopropane-1-carboxylate, hydrogen cyanate (HCN), and ammonia production, nitrogenase activity (Glick, 2012 and Khan, 2005) phosphate solubilization (Ahemad and Khan, 2012c) etc. Hence, diverse symbiotic (Rhizobium, Bradyrhizobium, Mesorhizobium) and non-symbiotic (Pseudomonas, Bacillus, Klebsiella, Azotobacter, Azospirillum, Azomonas), rhizobacteria are now being used worldwide as bio-inoculants to promote plant growth and development under various stresses like Drought, heavy metals (Wani and Khan, 2010, salinity (Mayak et al., 2004) etc.

Although, the mechanisms of rhizobacteria-mediated plant growth promotion are not completely identified, the so-called plant growth promoting rhizobacteria however, have been reported to exhibit the above mentioned properties to expedite the plant growth and development (Khan et al., 2009 and Zaidi et al., 2009). The present review is an effort to elucidate the concept of rhizobacteria in the current scenario and their underlying mechanisms of plant growth promotion with recent updates. The latest paradigms of a wide range of applications of these beneficial rhizobacteria in different agro-ecosystems have been presented explicitly to garner broad perspectives regarding their functioning and applicability.

Rhizosphere

The narrow zone of soil directly surrounding the root system is referred to as rhizosphere (Walker et al., 2003), while the term ‘rhizobacteria’ implies a group of rhizosphere bacteria competent in colonizing the root environment (Kloepper et al., 1994). In addition to providing the mechanical support and facilitating water and nutrient uptake, plant roots also synthesize, accumulate, and secrete a diverse array of compounds (Walker et al., 2003). These compounds secreted by plant roots act as chemical attractants for a vast number of heterogeneous, diverse and actively metabolizing soil microbial communities. The chemicals which are secreted by roots into the soils are generally called as root exudates. The exudation of a wide range of chemical compound modifies the chemical and physical properties of the soil and thus, regulates the structure of soil microbial community in the immediate vicinity of root surface (Dakora and Phillips, 2002). In fact, some of the exudates act as repellants against microorganisms while others act as attractants to lodge the microbes. The composition of these exudates is dependent upon the physiological status and species of plants and microorganisms (Kang et al., 2010). Moreover, these exudates also promote the plant-beneficial symbiotic interactions and inhibit the growth of the competing plant species (Nardi et al., 2000). Also, microbial activity in the rhizosphere affects rooting patterns and the supply of available nutrients to plants, thereby modifying the quality and quantity of root exudates. A fraction of these plant-derived small organic

molecules is further metabolized by microorganisms in the vicinity as carbon and nitrogen sources, and some microbe-oriented molecules are subsequently re-taken up by plants for growth and development (Kang et al., 2010). Indeed, carbon fluxes are critical determinants of rhizosphere function. It is reported that approximately 5–21% of photosynthetically fixed carbon is transported to the rhizosphere through root exudation (Mayak et al., 2004). Thus, the rhizosphere can be defined as any volume of soil specifically influenced by plant roots and/or in association with roots hairs, and plant-produced materials (Hayat et al., 2010). Largely, three separate but interacting components are recognized in the rhizosphere: the rhizosphere (soil), the rhizoplane, and the root itself. Of these, the rhizosphere is the zone of soil influenced by roots through the release of substrates that affect microbial activity. The rhizoplane, on the other hand, is the root surface including the strongly adhering soil particles while the root itself is a component of the system, because many micro-organisms (like endophytes) also colonize the root tissues (Barea et al., 2005). Microbial colonization of the rhizoplane and/or root tissues is known as root colonization, whereas the colonization of the adjacent volume of soil under the influence of the root is known as rhizosphere colonization (Barea et al., 2005, Kloepper et al., 1981 and Kloepper, 1994).

Plant growth promoting rhizobacteria

The plant growth promoting rhizobacteria (PGPR), are characterized by the following inherent distinctiveness's: (i) they must be proficient to colonize the root surface (ii) they must survive, multiply and compete with other microbiota, at least for the time needed to express their plant growth promotion/protection activities, and (iii) they must promote plant growth (Kloepper, 1994). About 2–5% of rhizobacteria, when reintroduced by plant inoculation in a soil containing competitive microflora, exert a beneficial effect on plant growth and are termed as plant growth promoting rhizobacteria (Kloepper and Schroth, 1978). In accordance with Vessey (2003), soil bacterial species burgeoning in plant rhizosphere which grow in, on, or around plant tissues stimulate plant growth by a plethora of mechanisms are collectively known as PGPR (plant growth promoting rhizobacteria).

Alternatively, Somers et al. (2004) classified PGPR based on their functional activities as (i) biofertilizers (increasing the availability of nutrients to plant), (ii) phytostimulators (plant growth promotion, generally through phytohormones), (iii) rhizoremediators (degrading organic pollutants) and (iv) biopesticides (controlling diseases, mainly by the production of antibiotics and antifungal metabolites) (Antoun and Prévost, 2005). Furthermore, in most studied cases, a single PGPR will often reveal multiple modes of action including biological control (Kloepper, 2003 and Vessey, 2003). Furthermore, Gray and Smith (2005) have recently shown that the PGPR associations range in the degree of bacterial proximity to the root and intimacy of association. In general, these can be separated into extracellular (ePGPR), existing in the rhizosphere, on the rhizoplane, or in the spaces between cells of the root cortex, and intracellular (iPGPR), which exist inside root cells, generally in specialized nodular structures (Figueiredo et al., 2011). Some examples of ePGPR are like, Agrobacterium, Arthrobacter, Azotobacter, Azospirillum, Bacillus, Burkholderia, Caulobacter, Chromobacterium, Erwinia, Flavobacterium, Micrococcous, Pseudomonas and Serratia etc. (Bhattacharyya and Jha, 2012). Similarly, some examples of the iPGPR are Allorhizobium, Azorhizobium, Bradyrhizobium, Mesorhizobium and Rhizobium of the family Rhizobiaceae. Most of rhizobacteria belonging to this group are Gram-negative rods with a lower proportion being Gram-positive rods, cocci or pleomorphic (Bhattacharyya and Jha, 2012). Moreover, numerous actinomycetes are also one of the major components of rhizosphere microbial communities displaying marvelous plant growth beneficial traits (Bhattacharyya and Jha, 2012 and Bashan and Holguin, 1997). Among them, Micromonospora sp., Streptomyces spp., Streptosporangium sp., and Thermobifida sp., which have shown an enormous potential as biocontrol agents against different root fungal pathogens, are worthy of mention (Bhattacharyya and Jha, 2012 and Nadeem et al., 2009).

Mechanisms of plant growth promotion

According to Kloepper and Schroth (1981), PGPR mediated plant growth promotion occurs by the alteration of the whole microbial community in rhizosphere niche through the production of various substances. Generally, PGPR promote plant growth directly by either facilitating resource acquisition (nitrogen, phosphorus and essential minerals) or modulating plant hormone levels, or indirectly by decreasing the inhibitory effects of various pathogens on plant growth and development in the forms of biocontrol agents (Glick, 2012)

Direct mechanisms

Nitrogen fixation

Nitrogen (N) is the most vital nutrient for plant growth and productivity. Although, there is about 78% N_2 in the atmosphere, it is unavailable to the growing plants. The atmospheric N_2 is converted into plant-utilizable forms by biological N_2 fixation (BNF) which changes nitrogen to ammonia by nitrogen fixing microorganisms using a complex enzyme system known as nitrogenase (Kim and Rees, 1994). In fact, BNF accounts for approximately two-thirds of the nitrogen fixed globally, while the rest of the nitrogen is industrially synthesized by the Haber–Bosch process (Dakora and Phillips, 2002). Biological nitrogen fixation occurs, generally at mild temperatures, by nitrogen fixing microorganisms, which are widely distributed in nature (Somers et al., 2004). Furthermore, BNF represents an economically beneficial and environmentally sound alternative to chemical fertilizers (Khalid et al., 2004).

Nitrogen fixing organisms are generally categorized as (a) symbiotic N_2 fixing bacteria including members of the family rhizobiaceae which forms symbiosis with leguminous plants (e.g. rhizobia) (Zahran, 2001) and non-leguminous trees (e.g. Frankia) and (b) non-symbiotic (free living, associative and endophytes) nitrogen fixing forms such as cyanobacteria (Anabaena, Nostoc), Azospirillum, Azotobacter, Gluconoacetobacter diazotrophicus and Azocarus etc. (Bhattacharyya and Jha, 2012). However, non-symbiotic nitrogen fixing bacteria provide only a small amount of the fixed nitrogen that the bacterially-associated host plant requires (Glick, 2012). Symbiotic nitrogen fixing rhizobia within the rhizobiaceae family (α-proteobacteria) infect and establish symbiotic relationship with the roots of leguminous plants. The establishment of the symbiosis involves a complex interplay between host and symbiont (Spaepen and Vanderleyden, 2011)resulting in the formation of the nodules wherein the rhizobia colonize as intracellular symbionts . Plant growth-promoting rhizobacteria that fix N_2 in non-leguminous plants are also called as diazotrophs capable of forming a non-obligate interaction with the host plants (Glick et al., 1999). The process of N_2 fixation is carried out by a complex enzyme, the nitrogenase complex (Kim and Rees, 1994). Structure of nitrogenase was elucidated by Bashan and Holguin (1997) as a two-component metalloenzyme consisting of (i) dinitrogenase reductase which is the iron protein and (ii) dinitrogenase which has a metal cofactor. Dinitrogenase reductase provides electrons with high reducing power while dinitrogenase uses these electrons to reduce N_2 to NH_3. Based on the metal cofactor three different N fixing systems have been identified (a) Mo-nitrogenase, (b) V-nitrogenase and (c) Fe-nitrogenase. Structurally, N_2-fixing system varies among different bacterial genera. Most biological nitrogen fixation is carried out by the activity of the molybdenum nitrogenase, which is found in all diazotrophs (Spaepen and Vanderleyden, 2011).

Phosphate Solubilisation

Phosphorus is second only to nitrogen as a mineral nutrient required by plants and microorganisms, its major physiological role being, in certain essential steps, the accumulation and release of energy during cellular metabolism. Phosphorus in soils is immobilized or becomes less soluble either by absorption, chemical precipitation, or both. Plants can absorb only inorganic phosphorus, and the concentration of inorganic phosphate in the soil is very low because most of the phosphorus in soils is present in insoluble forms. This, combined with the relative

immobility of the ion in the soil, can cause the phosphate supply to be the limiting factor for plant growth. Organic phosphate can constitute 4–90% of the total soil phosphate. Therefore, organic phosphate mineralization is an important soil process because it results in release of inorganic phosphorus to the soil solution for its availability to plants and soil microbes. Microorganisms are known to solubilize insoluble phosphate through the production of organic acids and chelating oxo acids from sugars. Seed or soil inoculation with phosphate-solubilizing bacteria (PSB) is known to improve solubilization of fixed soil phosphorus and applied phosphates, resulting in higher crop yields the use of rock phosphate as phosphate fertilizer and its solubilization through microbes have become a valid alternative to expensive chemical fertilizers. In conjugation with PSB, these materials should provide a cheap source of phosphate fertilizer for crop production. Hence, PSB has the potential to improve crop production in this area. The establishment and performance of these microbes are affected severely under stress such as high salt, pH, and temperature prevalent in degraded eco systems such as alkaline soils with a tendency to fix phosphorus In the alkaline soils of the tropics, salts concentrations may be as high as 2%, pH as high as 10.5, and temperature may range between 35° and 45°C, which may result in poor growth and survival of PSB.

Some rhizosphere microorganisms not only promote plant growth, but also induce systematic acquired resistance against a broad spectrum a pathogens. Especially phosphates solubilizing bacteria and mycorrhiza have ability to promote plant by increasing phosphate in soils deficient with available phosphorus. P-solubilizing bacteria (PSB) are one of the most popular choices of bacteria fertilizers since they could solubilize and mobilize the insoluble P compounds accumulated on soil by biotic acidification (organic acid production), chelating and exchange reactions (Wu et al.,2007). Organic acids produced by bactrtia include citric lactic, oxalic, succinic, acetic, fumaric, acid, tartaric and keto-glutaric acid (Tank and Saraf, 2003). Among these citric and fumaric acids have highest P-solubilizing ability. The action of organic acids has been attributed to their chelating property which enables them to form stable complexes with calcium, magnesium, iron and aluminum. The P- solubilizing microorganisms include bacteria, cyanobacteria, fungi, yeast and actionmycetes. However most of the P-solubilizing microorganisms isolated are bacteria and fungi. The most efficient P-solubilizing fungi belong to the genera Penicillium and Aspergillus (Khan et al., 2006) and the bacteria solubilizing P have been reported from the genera Achromobacter, Agrobacterium , Enterobacter, Pseudomonas, Serratia (Lawongsa et al., 2008) and several others. Bacillus (Bhattacharya and Jha, 2012; Wu et al., 2009) and Pseudomonas being the most efficient ones.

Bacteria growing in alkaline soils in India during the summer season are subjected to high salt, high pH and high temperature stress, prevalent in degraded ecosystems like alkaline and saline soils. In the alkaline soil of the tropics salt concentration and pH may be as high as 2% and 10.5 respectively, and temperature may range between 35-45c resulting in the poor growth and survival of PSB (Sharma et el., 2003). An understanding of the phosphate solubilization by phosphate – solubilizing bacteria has been carefully studied under sub-optimal conditions (Gray and Smith , 2005). The production of metabolites beneficial to the plant, such as phytohormones, antibiotics or sideophores, among other has created confusion about the specific role of phosphate solubilization in plant growth and yield stimulation. However at present there is evidences supporting several soil microorganism include bacteria improve the supply of organic phosphate solubilization (Rajkumar et al., 2005). Ahmad et al.(2008) demonstrated growth stimulation of maize and lettuce by several microorganisms capable of mineral phosphate solubilization .An isolate of Burkhoderia cepacio showing no indole acetic acid production, but displayed significant mineral phosphate solubilization and moderate phosphate activity (Khan et al., 2009) that has improved the yield of tomato, onion, banana, citrus and coffee , in the field test , and is currently being used as a commercial biofertilizer in Cuba.

Exopolysaccharide Production

Exopolysaccharides (EPSs) are a group of carbohydrates secreted from various bacterial species including pathogenic and symbiotic bacteria and fungi. It is believed that microbial action on soil aggregation is due to production of exopolysaccharides. This is supported by experimental observations demonstrating that that the amendment of soil

with microbial EPS results in an increased soil aggregation. Studying soil RAS (root adhering soil aggregation is important because it forms the immediate environment around the plant roots and therefore affect the availability of water and other nutrients. EPS forms a large component of PGPR biofilms, their contribution to biofilm structure and function has been examined for only a few organisms. The surface exopolysaccharide molecules of PGPR are synthesized at a membrane complex, which is regulated by both transcriptional and post-translational controls. The acidic exopolysaccharide probably plays both a passive and an active role during the invasion process.

Biofilm formation

In the vast majority of ecosystems, microbial cells grow in association with surfaces (Costerton et al., 1985). Surface-associated growth leads to the formation of a biofilm, a highly structured, sessile microbial community. Khan et al. (2009) defined biofilm as "a structured community of PGPR cells enclosed in a self-Produced polymeric matrix and adherent to an inert or living surface." Most plant PGPR associations rely upon PGPR and plant tissues through micro colonies termed as bilfilm (Sharma et al., 2003).The formation of a mature biofilm is believed to occur in a sequential process of transport of microorganisms to a surface, initial microbial attachment, formation of micro colonies, and formation of mature biofilms (Vikram et al., 2008).Cellular components are required for the sequence of events leading to mature biofilm formation, and changes in gene expression likely lead to changes in these cellular components. Of the processes leading to mature biofilm development, PGPR structural components for initial attachment have been best characterized; primarily structural components shown to play a critical role in facilitating PGPR interaction with surfaces include flagella, pili, and adhesions. The primary function of flagella in biofilm formation is assumed to be in transport and in initial cell to surface interactions. The absence of flagella impaired Pseudomonas fluorescens and Pseudomonas putida in colonization of potato and wheat roots (Suman et al., 2001) and reduced cellular adhesion of Pseudomonas aeruginosa to a polystyrene surface (Pili and pilus associated adhesions have been shown to be important for the adherence to and colonization of surfaces.Membrane proteins may also influence PGPR attachment processes. Mutations in surface and membrance proteins, including a calcium-binding protein, a hemolysin, a peptide transporter, and a potential glutathione-regulated K efflux pump caused defects in attachment of Pseudomonas putida to corn (Espincsa et al., 2000).

Phytohormone Production

The enhancement in various agronomic yields due to PGPR has been reported because of the production of growth stimulating phytohormones such as indole-3-acetic acid (IAA), gibberellic acid (GA_3), zeatin, ethylene and abscisic acid (ABA). Plant hormones play important roles in plant growth and development and in response of plants to their environment. Oreover, during its lifetime, a plant is subjected to a number of nonlethal stresses that can limit its growth until either the stress is removed or the plant is able to adjust its metabolism to overcome the effects of stressors. Rhizosphere microorganisms may also produce or modulate phytohormones under invitro conditions so that it can alter phytohormone levels and thereby affect the plant's hormonal balance and its response to stress.Microbial production of individual phytohormones such as auxins and cytokinins has been reviewed by various authors over the last 20 years (Burd etal., 2000; Mayak et al., 1999; Thakuria et al., 2004; Keister and Cregan, 1991; Barbieri and Galli, 1993; Patten and Glick, 1996, 2002; Selvakumar et al., 2008; Murphy et al., 2000; Spaepen et al., 2007).Some of the plant responses to auxin are as follows: Cell enlargement, Cell division, Root initiation, Root growth inhibition, Increased growth rate, Phototropism, Geotropism, Apical dominance. Microorganisms isolated from the rhizosphere of various crops have the ability to produce auxins as secondary metabolites (Khan et al.,2002). Bacteria belonging to the genera Azospirillum, Pseudomonas, Xanthomonas, and PGPR as well as Alcaligenes faecalis, Enterobacter, Acetobacter diazotrophicus and Bradyrhizobium japonicum have been shown to produce auxins which help in stimulating plant growth (Patten and Glick, 1996; Tao et al., 2008; Spaepen et al., 2007).

Khan et al., (2005) suggested that E. cloacae, isolated from the rhizosphere of cucumber, synthesized IAA via the indolepyruvic acid pathway and promoted growth of various agricultural plants. P. fluorescens demonstrated the ability to convert L-tryptophan directly into indole-3- acetaldehyde (Merino et al., 2008) isolates such a B. cereus and A. brasiense produced IAA by the tryptamine pathway (Tsavkelova et al., 2005). PGPR production of IAA suggests that the pathways involved in IAA production may play an important role in defining the effect of the bacterium on the plant (Patten and Glick 1996) Glick et al (1999) reported the most of the pathogenic isolates of bacteria synthesized IAA via the indoleacetamide pathway while plants use the indolepyruvic acid pathway. This helps the bacteria to evade plant regulatory signals and thus the IAA produced induces uncontrolled growth in plant tissues. In contrast the beneficial bacteria such as PGPR synthesized IAA via the indolepyruvic acid pathway and the IAA secreted is thought to be strictly regulated by the plant regulatory signals. Differences in the production of IAA among bacterial isolates can be attributed to various biosynthetic pathways location of the genes involved, regulatory sequences and the presence of enzymes to convert active free IAA into conjugated forms. It is also dependent on environmental conditions (Patten and Glick 1996). In 2008, Ahmad et al demonstrated the production of indole acetic acid and indole lactic acid by Azopirillum brasilense Sp13t SR2 increased with increasing concentrations of tryptophan (1-100ug/ml). In contrast, the production of indole acetic acid an indole -3-butyric acid by cultures of A. brasilaense in the absence of tryptophan was identified using gas liqiuid chromatography (GLC) and gas chromatography –mass sepectrometry (GC-MS) by Cazorla et al., 2007 Plant growth – promoting rhizobacteria strain G20-18 and two mutants produced IAA in pure culture.

Sequestering iron

Despite the fact that iron is the fourth most abundant element on earth, in aerobic soils, iron is not readily assimilated by either bacteria or plants because ferric ions Fe^{3+}, which is the predominant form in nature, is only sparingly soluble so that the amount of iron available for assimilation by living organisms is extremely low. Both microorganisms and plant require high level of iron, and obtaining sufficient iron is even more problematic in the rhizosphere where plant, bacteria and fungi compete for iron. To survive with such a limited supply of iron, bacteria synthesize low molecular mass siderophores (~400-1500Da), molecules with exceptionally high affinity for Fe^{3+} as well as membrane receptors able to bind the Fe-siderophore complex, thereby facilitating iron uptake by microorganisms(Neilands, 1995; Schmidt,1999; Rajkumar et al., 2005). The provision of iron to plants by soil bacteria is even more important when the plants are exposed to an environmental stress such as heavy metal pollution, in this case siderophore help to alleviate the stresses imposed on plants by high soil levels of heavy metals(Wittenburg et al., 1996).

Aminocyclopropane-1-carboxylate (ACC) deaminase

Generally, ethylene is an essential metabolite for the normal growth and development of plants (Babalola et al., 2003; Khalid et al. 2004). This plant growth hormone is produced endogenously by approximately all plants and is also produced by different biotic and abiotic processes in soils and is important in inducing multifarious physiological changes in plants. Apart from being a plant growth regulator, ethylene has also been established as a stress hormone (McKenzie and Roberts, 1990; Lawongsa et al., 2008; Saleem et al., 2007; Arshad et al., 2007). Under stress conditions like those generated by salinity, drought, water logging, heavy metals and pathogenicity, the endogenous level of ethylene is significantly increased which negatively affects the overall plant growth. For instance, the high concentration of ethylene induces defoliation and other cellular processes that may lead to reduced crop performance (Saleem et al., 2007 and Bhattacharyya and Jha, 2012). Plant growth promoting rhizobacteria which possess the enzyme, 1-aminocyclopropane-1-carboxylate (ACC) deaminase, facilitate plant growth and development by decreasing ethylene levels, inducing salt tolerance and reducing drought stress in plants (Nadeem et al., 2007 and Zahir et al., 2008). Currently, bacterial strains exhibiting ACC deaminase activity have been identified in a wide range of genera such as Acinetobacter, Achromobacter, Agrobacterium, Alcaligenes, Azospirillum, Bacillus, Burkholderia, Enterobacter, Pseudomonas, Ralstonia, Serratia and Rhizobium etc. (Shaharoona et al., 2006, Tank and

Saraf , 2009; Nadeem et al., 2007, Zahir et al., 2008, Kang et al., 2010). Such rhizobacteria take up the ethylene precursor ACC and convert it into 2-oxobutanoate and NH_3 (Arshad et al., 2007). Several forms of stress are relieved by ACC deaminase producers, such as effects of phytopathogenic microorganisms (viruses, bacteria, and fungi etc.), and resistance to stress from polyaromatic hydrocarbons, heavy metals, radiation, wounding, insect predation, high salt concentration, draft, extremes of temperature, high light intensity, and flooding (Glick, 2012 and Lugtenberg and Kamilova, 2009). As a result, the major noticeable effects of seed/ root inoculation with ACC deaminase-producing rhizobacteria are the plant root elongation, promotion of shoot growth, and enhancement in rhizobial nodulation and N, P and K uptake as well as mycorrhizal colonization in various crops (Nadeem et al., 2007, Shaharoona et al., 2006, Nadeem et al., 2009 and Glick, 2012).

Indirect mechanisms

The application of microorganisms to control diseases, which is a form of biological control, is an environment-friendly approach (Lugtenberg and Kamilova, 2009). The major indirect mechanism of plant growth promotion in rhizobacteria is through acting as biocontrol agents (Glick, 2012). In general, competition for nutrients, niche exclusion, induced systemic resistance and antifungal metabolites production are the chief modes of biocontrol activity in PGPR (Lugtenberg and Kamilova, 2009). Many rhizobacteria have been reported to produce antifungal metabolites like, HCN, phenazines, pyrrolnitrin, 2,4-diacetylphloroglucinol, pyoluteorin, viscosinamide and tensin (Bhattacharyya and Jha, 2012; Rajkumar and Frietas, 2008). Interaction of some rhizobacteria with the plant roots can result in plant resistance against some pathogenic bacteria, fungi, and viruses. This phenomenon is called induced systemic resistance (ISR) (Lugtenberg and Kamilova, 2009; Tank and Saraf, 2003). Moreover, ISR involves jasmonate and ethylene signaling within the plant and these hormones stimulate the host plant's defense responses against a variety of plant pathogens (Glick, 2012). Many individual bacterial components induce ISR, such as lipopolysaccharides (LPS), flagella, siderophores, cyclic lipopeptides, 2,4-diacetylphloroglucinol, homoserine lactones, and volatiles like, acetoin and 2,3-butanediol (Lugtenberg and Kamilova, 2009).

Biocontrol

Soil-borne pathogens are well known for their devastating effects on plant health and yield. For successful disease management, it is important to find the most effective and economical ways to protect the plant from various pests or diseases. The use of bacterial isolates in plant frontline defence may offer a practical way to deliver immunization. Mode of action studies have revealed that biological control by PGPR involves production of bacterial metabolites that reduce the population or activities of pathogens or deleterious rhizosphere microflora (Glick, 1995; Kloepper, 2003). These metabolites may include siderophores that bind Fe, making it less available to certain members of the native pathogenic microflora (Pandey et al., 2006; Joseph et al., 2007; Bashan and Holguin, 1997; Sarvanakumara et al., 2007)

Production of antibiotics

Antibiotic production is one of the most intensively studied aspects of biocontrol, but in many cases it is difficult to distinguish between antibiosis and competition. Several studies have demonstrated that production of antibiotics (e.g. pyrrolnitrin, phycocyanin, 2, 4- diacetylphloroglucinol) by microbial inocula can cause suppression of pathogens (Khalid et al.,2004; Glick, 1995). Glick (2012) was of the view that the most effective mechanism that a PGPR can employ to prevent proliferation of phytopathogens is the synthesis of antibiotics. Other mechanisms for biological control of disease may include competition for infection sites and nutrients, parasitism on pathogens, i.e. destruction of fungal pathogens by the action of lytic enzymes (e.g. chitinase and β-1, 3-glucanase) that degrade fungal cell walls, and uncharacterised antifungal factors (Rajkumar etal., 2010; Gupta et al., 2002; Kloepper, 2003;). Buchenauer (1998) reported various mechanisms for biological control such as competition for space and nutrients in the rhizosphere

and spermosphere, lytic enzymes, HCN and many other metabolites produced by PGPR. The potential effect and successful contribution of bacterial isolates on plant growth is strongly influenced by environmental factors including soil characteristics, plant species and even plant genotypes within a species, and other microflora indigenous to the rhizosphere (Beneduzi et al.,2008). PGPR can also trigger a phenomenon in plants known as induced systemic resistance (ISR) that is phenotypically similar to the systemic acquired resistance (SAR) that occurs when plants activate their defense mechanisms in response to infection by a pathogenic agent.

CONCLUSION

Plant growth promoting rhizobacteria, having multiple activities directed toward plant growth promotion vis-à-vis exhibiting bioremediating potentials by detoxifying pollutants like, heavy metals and pesticides and controlling a range of phytopathogens as biopesticides, have shown spectacular results in different crop studies. The productive efficiency of a specific PGPR may be further enhanced with the optimization and acclimatization according to the prevailing soil conditions. In future, they are expected to replace the chemical fertilizers, pesticides and artificial growth regulators which have numerous side-effects to sustainable agriculture. Further research and understanding of mechanisms of PGPR mediated-phytostimulation would pave the way to find out more competent rhizobacterial strains which may work under diverse agro-ecological conditions.

ACKNOWLEDGEMENTS

The author would like to thank CSIR for Research Associate fellowship.

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Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Morphological and Anatomical Study of the African Ostrich Brain in City of Zabol

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Received: 16 Mar 2015 Revised: 24 Apr 2015 Accepted: 20 May 2015

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ABSTRACT

The morphological and anatomical specifications of the African ostrich brain that between the ages of 7 and 15 month in the city of zabol have been slaughtered were investigated in this study. The average weight, length and width of the total brain are 29.37 gr, 54.30 mm and 48.09 mm respectively. The african ostrich brain has many more transverse fissures of the cerebellar vermis than do the brains of domestic fowls. The cerebellum become visible relatively well developed and obviously protrudes dorsally. The posterior superior part of the cerebellar vermis approximately forms an angle of 150°.The formation of the cerebrum is an obtuse triangle. Its surface is smooth, without any gyrus or sulcus. The gray matter is very thin. There is an arcuated telencephalic vallecula on the dorsal surface and the sagittal eminence is elliptic. The hypophysis is spherical. The olfactory bulbs are very small. The whole brain represents only 0.265% of the total body weight and it is 17 times lighter than the brain of domestic fowls. Statistical analysis showed that the ratio of brain weight to body weight is significantly smaller ($P < 0.01$) in the African ostrich than other domestic fowls investigated. The present study suggests that the brain of the African ostrich is underdeveloped.

Key words: African ostrich, brain, morphology, anatomy

INTRODUCTION

The African ostrich (Struthio camelus) belongs to the class Aves, order Struthioniformes, family Struthionidae, genus Struthio. It is the only extant species of 2-toe birds in the world, and its frame is the largest of all extant birds. They mainly live in dry African regions and the extremely hot Arabian Desert, in harsh climates with food shortages

(Mushi et al., 1998). The male African ostrich can reach 3 m in height. The body length ranges from 1.5 m to 2.5 m, and the body weight can reach 140 kg. In the past, the ostriches that people saw were generally just in zoos for visitors. The ostrich breeding industry is growing rapidly in many places, including the USA, Australia, New Zealand, Israel, Canada, Europe, and China (Al-Nasser et al., 2003). The ostrich are used principally for the production of meat of highest protein value and lowest cholesterol level. The percentages of both fat and cholesterol are lower in ostrich meat than in pork, beef, or chicken (Mushi et al., 1998, Anonymous, 1944, Peng et al., 2004). Its skin is the most valuable top-grade leather, more expensive than that of crocodile. There are many reports about the bioecology and breeding of ostriches (Saayman et al., 1986, Skadhauge et al., 1999), and others about ostrich morphology (Peng et al., 1997, Wang et al., 2001). However, there has been no report about the central nervous system of the African ostrich that between the ages of 7 and 15 month have been slaughtered. Therefore, this research provides reliable morphological and anatomical data for the physiological functions, and disease prevention of the ostrich.

MATERIALS AND METHODS

Ten African ostriches (5males and 5 females), weighing 90-140 kg, with the ages of 7 to 15 month were used in this study. After carnage of this ostriches in slaughterhouses of Zabol city, the skull was immediately removed and opened so as to remove the entire brain; data from every part of the brain were gathered with a sliding caliper. Then statistical analysis was done and pictures were taken. Nomina Anatomica Avium was used for the anatomical nomenclature (Baumel et al., 1993). The means and standard deviations of each item were calculated. The statistical significance was considered at $P < 0.01$. The internal structure of the African ostrich brain will be described in detail in another paper.

RESULTS

Shape of the whole brain

After application of a biodemography method, documents about the external morphology of the African ostrich brain were compiled in the Table. Statistical analysis showed that the ratio of brain weight to body weight is significantly smaller ($P < 0.01$) in the African ostrich than other birds.

The dorsal view

Two cerebral hemispheres are at the anterior part of the African ostrich brain, and the cerebellum and medulla are at the posterior part. A cerebral longitudinal fissure is between the 2 cerebral hemispheres and there is a transverse sulcus between the cerebrum and cerebellum. The cerebral surface is smooth, and there is no gyrus or sulcus on it. However, on the dorsal surface of the cerebrum, there is a cambered supersulcus bending posterior-medially, a so-called telencephalic vallecula. The formation of the cerebrum is an obtuse triangle. The cerebellum is located behind the transverse sulcus. An obvious vermis is at the center of the cerebellum with some transverse fissures, and there is a cerebellar auricle on each side of the vermis.The ventral view:

At the foremost head of the brain of the African ostrich, there is an underdeveloped olfactory bulb on each side of the cerebral hemisphere. The optic chiasm occurs at the center rear of the 2 cerebral hemispheres. The orbital faces of the cerebral hemisphere are located in the anterior part of the brain. The front portion of the brain stem is the hypothalamus, with a small global hypophysis on it. The midbrain peduncle, the pons, and the medulla oblongata are located consecutively at the back. There is no apparent demarcation between the midbrain and the pons and the medulla oblongata.

The morphological and anatomical characteristics of each part of the ostrich brain:

1) **Cerebrum:** The cerebrum of the ostrich appears as an obtuse triangle from the dorsal view. The surface of the cerebrum is smooth. The posterior part of the cerebral hemisphere is wide, connecting with the optic lobe of the midbrain. The middle of the head of the ostrich's cerebral hemisphere is a relative cusp, linking to the undeveloped olfactory bulb. The left and right lateral parts of the cerebrum expand laterally, as a hemicycle.

2) **Cerebellum:** The cerebellum of the African ostrich is relatively developed. The average length of the cerebellar vermis is 34.07 mm and the average height of the cerebellar vermis is 11.70 mm. The length is 2.91 times larger than the height and the top of the cerebellum is relatively smooth.

3) **Brain stem:** The brain stem of the African ostrich, including the midbrain, pons, and medulla oblongata, is similar to those of the other domestic fowls.

DISCUSSION

The nervous system is the most complicated and important synthetic organ system of animals. Its general functions are linked to the enhancement of its characteristic centralization that makes the nervous system form a central part and peripheric part, the central part being more important. The magnitude and shape of the cerebella are significantly different according to disparate animal categories, and the degree of the cerebellum's development is relevant to the degree of the complexity of body kinematics (Romer, 1977).The cerebella of avian species are more developed than those of crawling animals. The cerebellum of the African ostrich protrudes visibly upward and its length is approximately 1.5 times larger than its height. The posterior superior part of the cerebellar vermis almost forms an angle of 150° and the number of transverse sulci of the cerebellar vermis is much larger than that of the domestic fowls. Some experiments show that injuring the cerebellum will severely impact the accuracy of voluntary movement and cause dyskinesia, including the change of muscular tension, disequilibrium, hypomotility or involuntary movement, and so on (Ruan et al., 1985). The Table above shows that in African ostriches of weight 90-140 kg, the brain weighs 29.37 g, representing only 0.26% of the body weight. this data demonstrate that the encephalic ratio of the African ostrich is the lowest among the other domestic fowls. As mentioned above, it is obvious that the morphological characteristics of the African ostrich brain are coincident with its physiological functions.

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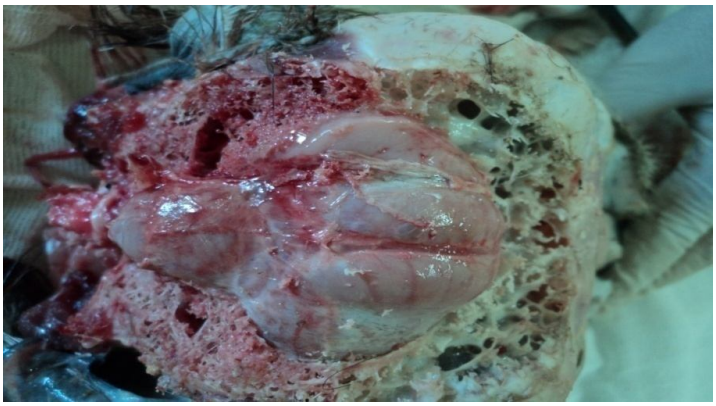

Fig 1. The dorsal view of the African ostrich brain

Fig 2. The ventral view of the African ostrich brain

Fig 3. The African ostrich head

Fig 4. The African ostrich skull

Fig 5. The dorsal view of the African ostrich brain

Table. Data of sections of the African ostrich brain.

items	mean	variance	Standard deviation
Total brain length/ mm	54.30	86.90	9.32
Total brain width/ mm	48.09	6.10	78.10
Total brain weight/g	29.37	55.17	7.42
Cerebellum width/ mm	29.52	1.46	38.30
Cerebellum length/ mm	34.07	2.43	49.31
Cerebrum length/ mm	40.95	4.56	67.56

Indian Journal Of Natural Sciences *www.tnsroindia.org. © IJONS*

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Investigating the Relationship between Positive and Negative Affect and Life Satisfaction (Subjective Well- Being) with Addiction to Internet among Female Students of High Schools in Tehran

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Received: 23 Mar 2015 Revised: 25 Apr 2015 Accepted: 20 May 2015

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ABSTRACT

In today society, using virtual space is attractive for all social groups, from male and females, elderlies and youngsters and educated and illiterate ones, such that using this technology has become inevitable. , so that the researcher decided to investigate the relationship between addiction to internet with its positive psychological aspects such as mental well- being in order to see to be more realistic than disorder. This is a correlation based applied research. The research method is multi- variable and statistical population includes adolescents who are addicted and not addicted to internet in region 4 and 8 of Tehran during 2013-2014. Method used for selection of samples is multi- stage cluster random sampling. For estimating sample size, Cochran's formula was used that was consisted of 402 individuals. In order to collect data, Young's internet addiction questionnaire and POPS autonomy skill questionnaire and PANAS life satisfaction questionnaire and SWS positive and negative emotion were applied. The data were analyzed using descriptive statistical method, Pearson's correlation coefficient, multi-variable regression analysis and t test. Having happy morale and life satisfaction may play significant role in reducing addiction to internet. Mental well- being causes balanced growth and health in humans and paves the way for more accurate and extensive enhancement of their talents and personal and social growth depends on how much this issue is valued.

Key words: subjective well-being, student, internet addiction.

INTRODUCTION

In today's society use of cyberspace among all social groups including men and women, young and old, literate and illiterate has a special attraction. For those who use this technology are inevitable and make life difficult for those who are accustomed. The Internet, like any other technology with many benefits, is accompanied by consequences and undesirable consequences for the progress of society. Each family may be susceptible to damage from cyber widest variety of internet it takes. Given that the main pillar of society is family and constitutes an important negative effects and damage caused by abnormal use of virtual environments is crucial and it is necessary (Farahani.M,2008). Lin and T. Sun (2002) described the Internet as a communication tool was available; it was used as a tool for deviant. People in cyberspace because of its features such as global and transnational, charm and diversity, freedom of communication, ease of availability, anonymity of users, escaping from reality and idealism much easier than the real space can be deviant acts (quoting mature blond 2001). The Internet itself harmless tool, but it's too bad that the risk of addiction to the Internet for this phenomenon has created a major problem for the mental health community. Perhaps it could be said the most common injuries that are currently affected families, especially the young age is Internetaddiction. Internet addiction has the meaning of the Internet is too much or pathological extravagate (Wallace, 2003). People spend hours and days in this mode of communication within the network, they cannot cut off the connection, and do not show any interest in leaving their computers, little sleep, eating, work, social and family relationships and quit. And finally the real life activities and social relationships crumble apart basin (Yang and Tang, 2004 quoted Ehteshami).

Young, also said that although time is not the only determiner of Internet addiction,however, addicts are generally between 40 to 80 percent of their time in meetings that may be even up to 20 hours each spend. And it causes disturbances in sleep time and user-created content. Even in extreme cases, caffeine pills to facilitate longer being used on the Internet. This disturbance, fatigue, affectexcessively curriculum and occupational functions in the body that affects the immune system may be weakened and more vulnerable to the disease (Young, 2006).

Studies (Ehteshami,2010) on high school students of Tehran, Tehran West Zone 2 residents mostly used Internet users in Tehran was enough notes, all show a correlation between social isolation, depression and loss of family connection and usage of Internet addiction . The results of research conducted by the Dadgaran (2002) The relationship between social withdrawal, depression, anxiety, addiction to Internet users in Tehran was enough notes, all show a correlation between social isolation, depression and loss of family connections with Internet addiction and abuse it was too much. Orang R (2004) The impact of psychological dependence to chat on the mental health of the principal families of the results was that chat affect health Subjective well-being is a concept that how we think, feel and performance in dealing with life situations show. The subjective well-being is the harmonious conduct of society's recognition that social facts and the adjustment to satisfy their own needs are balanced.

Mental well-being is Quiet strength and live in peace with themselves and others of being. Subjective well-being requires an understanding and correct interpretation of the relevant State (Diener, 2006). And mental well-being is always a human desire. The prosperity and longer life, better mental well-being was its mean. But today the opposite of quantifying subjective well-being, and given the broad dimensions of health, defined in terms of years of life and its purpose is always the satisfaction, joy, and be happy. Mental wellbeing and wider dynamic concept of health. (Kyyzvshmvkyn 2002).

Ryan&Desy (2001) pointed out that the psychological well-being related to two relatively distinct roots in the philosophy of mind have been caused. In view of Hedonic well-being or happiness, happiness is composed of well-Ayvdaymyk the other is nothing more than personal happiness in the covers. This is an attempt to realize the true nature of the human ability to understand the scope.

Importance of addressing the mental well-being and Internet addiction has been shown in many studies. Thus, happy people, positive emotions and more positive evaluations of their experience and the events surrounding their peers. Sense of containment and control, and higher levels of educational attainment and experience greater life satisfaction. Healthier immune systems and are more creative.

Sheden (1996) believes that the welfare of individuals and communities and to promote the greatest scientific challenges of increasing and advances in technology, medicine and wealth. That's why today's treatments have focused on how to deal with internet modification and extension capabilities and the creation of life satisfaction in people, because in truth, happiness, and Depression (positive and negative affect), the two poles of the opposition the treatment of addiction viewed as a continuum not our Internet automatically does not lead to happiness and life satisfaction. . Accordingly, structured group therapy based on Internet addiction with cognitive-behavioral therapy seeks to change assignments and exercises are done in the main living areas.

Casio notedfive strategies for creating satisfaction in these areas, suggesting that satisfaction by creating the gap between what one wants and what it is looking for a certain subjective well-being enhance. Sanjvannyz study showed that life satisfaction and other indicators of positive adaptation may be a strong predictor of emotional conflicts (depression and anxiety) in men with cardiovascular disease. According to a recent study of positive psychology approaches In addition to medical services and education drummer for the prevention and promotion of mental well-being and life satisfaction is emphasized. And whether Internet addiction can be predicted based on the subjective well-being has been studied by psychology researchers.

The main hypothesis

The main hypothesis is based on the subjective well-being can be predicted dependence on the Internet.

Specific hypotheses

Monitoring Hypothesis: The components of subjective well-being can be predicted dependence on the Internet.

Method: The study used a correlational research. This research is an applied research. Multivariate Correlation Methods

The population of the study area 4&8 0f Tehran randomly selected among the twenty-three schools were randomly selected areas. Seventy-five patients were randomly selected from each school who were addicted and non-addicted teenagers in the years 2013-14. Method of sample selection stratified random multi-stage is to estimate the sample size of the Cochran formula used by the researcher to predict the loss of some of the participants in the process of study, sample size, sample 450 was taken from the final sample of 402 people with a loss of 48 subject. For Young Internet Addiction scale questionnaire of life satisfaction and positive and negative affect PANAS was SWIS use. Data analysis using descriptive statistics, Pearson correlation, multiple regression and t-test analysis was

METHODS

Satisfaction with Life Scale (SWLS)

Satisfaction with Life Scale by Daynr et al (1985) and has been prepared in order to measure life satisfaction. This scale is a self-reporting tool that consists of five words. These tests measure the cognitive component of subjective

well-being terms. Life satisfaction in 1998 in a cross-cultural study by Sah, Daynr, Avyshy and Tryandys German, Spanish and Japanese translations.

The reliability of Iranian: In Iran, bayani and colleagues (2007) due to Standardization of life satisfaction to be carried out on 109 students. Reliability this test with using Cronbach's alpha 83/0 and retest 0/69 respectively.

Guide to Positive and Negative Affect Scale (PANAS)

Positive and Negative Affect Scale by Watson and Associates in 1988 to evaluate the affective dimension of positive affect and negative affect were designed. The scale is 20. Each word contains expressions of emotion, positive or negative. Positive and Negative Affect Scale is a self-report instrument and subject to a 5-degree Likert (1= very low to very high = 5) determine to what extent each of the statements referred to experience well. The reliability of Persia: The Positive and Negative Affect Scale Abolqasemi in Iran (2003) was standardized. He has reported reliability coefficient test between 0/59 to 0/94.

Young Internet Addiction Scale (IAT)

It consists of 20 females Prshnamh is to measure the dependence of people on the Internet or computers is provided by a doctor Kimberly Young And answers it in a continuum of five was assigned a degree of Internet addiction, mild, moderate and severe measures Received the lowest score of 20 and a highest score of 100 is the reliability coefficient of the test was 68.

In this paper, according to the study variables and the type of data collected, in order to characterize them indicators of central tendency, dispersion and distribution of the scores was used. In the statistical analysis, due to the nature of the performance measure of the distance and Hypotheses to analyze the data in terms of the Pearson correlation and multiple regression analysis were used. Detailed results of this calculation are described in this chapter, the data is presented in two parts.

RESULTS

In this episode of the fourth season of data obtained from measurements of different variables, , In each case using appropriate statistical measures of central tendency such as mean, standard deviation and distribution parameters described.

Based on the values obtained in table 1 and 2, we can conclude that all the variables are significant negative correlation between the dependency on the Internet ($p<0/01$).

• The main hypothesis is based on the subjective well-being can be predicted dependence on the Internet.

As can be seen from the table 3, the value obtained (0/477) means that 47/7 percent of the variance in subjective well-being could be explained by the variable dependence on the Internet. In other words, 48 percent of the scatter observed in the correlation between these variables is justified by the Internet. The observed value of R (0/691) indicate that the linear model can be used for prediction. Furthermore, the calculated F ratio (136/430) is significant at a confidence level of at least 99 percent. Thus, we can conclude that the studied variables and the dependent variable, there is a significant correlation to the Internet. In conclusion, the evidence is sufficient to accept the original hypothesis. Mark Beta coefficients obtained showed that subjective well-being variables are negative and significant correlation with attachment to the Internet. Finally, according to the description and the coefficient obtained Based on

standardized regression coefficients regression equation can be formulated as follows: Y= (Mental wellbeing) 0/600– (dependent on the Internet) 59/541

• Monitoring Hypothesis: The components of subjective well-being can be predicted dependence on the Internet.

As can be seen from the table 4, the value obtained (0/715) means that 71/5 percent of the variance the dependence on the Internet by a third variable, life satisfaction, positive affect and negative affect explained. In other words, 71/5 percent of the scatter observed in the correlation between these variables is justified by the Internet. The observed value of R (0/845) indicate that the linear model can be used for prediction. Furthermore, the calculated F ratio (249/046) is significant at a confidence level of at least 99 percent. Thus, we can conclude that the studied variables and the dependent variable, there is a significant correlation to the Internet. In conclusion, the evidence is sufficient for the adoption of specific hypotheses. Refer to t-statistics and significance levels can be judged that the three variables of life satisfaction, positive affect and negative affect were significantly correlated with variable dependence on the Internet. Mark Beta coefficients obtained showed that the variable component of life satisfaction and positive affect, negative and significant correlation dependence on the Internet. However, the negative affect associated with positive and significant dependence on the Internet. . Finally, according to the description of the regression coefficients are obtained based on standardized regression coefficients are formulated as follows:

Y= (Negative affect) 0/159- (positive affect) 0/259 - (life satisfaction) 0/513– (dependent on the Internet)99/395

CONCLUSION

In this chapter, the author has attempted to separate the findings into two parts (Internet addicts and nonaddicts) to the prediction of subjective well-being addicted to the Internet to explain their findings. The results of this study support the role of each of the Welfare components Analogies Internet addiction, mental well-being were entered in the regression equation is considerably more important With respect to the obtained value (477/0) means that 7/47 percent of the variance in subjective well-being could be explained by the variable dependence on the Internet.

5/71% of the variance dependence on the Internet by three variables of life satisfaction, positive affect and negative affect explained. In other words, 6/41% of the scatter observed in the correlation between these variables is justified by the Internet.The observed value of R (645/0) indicate that the linear model can be used for prediction. Furthermore, the calculated F ratio (021/35) is significant at a confidence level of at least 99 percent. Thus, we can conclude that the studied variables and the dependent variable to the internet there is a significant correlation. In line with the literature findings of this study showed that Internet addiction is significant components of subjective well-being. Having a cheerful mood and satisfaction with living conditions can have a significant impact on reducing the addiction to the Internet. Subjective well-being cause good health and a balanced growth And paves the way to develop his talents better and wider and personal growth and social development depends on how much it will cost. The results of this study support the role of each of the components of subjective well-being than predicted Internet addiction were entered in the regression equation is of considerable importance.

Limitations of the study

Limitations of the research

1-Do this research is limited in terms of location to Tehran.
2-This study is limited in terms of time of 92-93 years.
3-This study is limited in terms of the female sex.
4-This study is limited in age to teenagers' ages 13-18 years

Limits Outside of the researcher controls

1-Given that the samples may have been selected wrong, we should be cautious in generalizing it
2-Another limitation of this study is to report the findings to the nature of the subject is concerned, for example, accurate decisions about how to actually make it impossible begins,
A suggestion to other researcher is that can be used to perform this research in other areas and other city to investigate further and also add another variable to the study.

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Table 1: Summary of statistical indicators related to the participants' scores on tests of mental well-being (and 3 component) and dependence on the Internet (N=302)

Variables	Components	Average	SD	Tilt	Elongation
Subjective well-being	Life satisfaction	24/43	7/42	-0/444	-0/895
	Positive affect	34/77	8/27	-0/627	-0/716
	Negative affect	26/90	6/49	0/749	-0/120
	Total	86/11	12/52	-0/440	-0/460
Dependence on internet	Dependence on internet	47/90	24/32	0/320	-1/542

Table 2: Summary of Pearson correlation coefficient between variables (Dependence on internet N=302)

Variables	r
Life satisfaction	-0/823*
Positive affect	-0/764*
Negative affect	-0/594*
Well-being total score	-0/684*

**significance level 0/01

Table 3: Summary of regression analysis to predict subjective well-being and self-reliance on the Internet (N=302)

predicator	B	Standard error	β	T	Sig
Fix score	126/220	7/066	-	22/958*	0/001
Mental well-being	-1/165	0/107	0/600	-10/839*	0/001

*R=0/691 ؛ R^2 =0/477 ؛ R^2 adjusted= 0/474 ؛ F =136/430
*significance level 0/01

Table 4: Summary of regression analysis to predict Internet dependence on the components of subjective well-being (N=302)

predicators	B	Standard error	β	t	Sig
Fixed score	99/359	6/590	-	15/077*	0/001
Life satisfaction	-1/680	0/197	-0/513	-8/513*	0/001
Positive affect	-0/761	0/163	-0/259	-4/663*	0/001
Negative affect	0/597	0/145	0/159	4/129*	0/001

*R=0/845 ؛ R^2 =0/715 ؛ R^2 adjusted= 0/712 ؛ F =249/046
*significance level 0/01

Indian Journal Of Natural Sciences *www.tnsroindia.org. © IJONS*

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Influence of Intercropping Mungbean and Sorghum on Ash, DMD and Dry Forage

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Received: 20 Mar 2015 Revised: 18 Apr 2015 Accepted: 26 May 2015

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ABSTRACT

Intercropping is being advocated as a new and improved approach to farming. However, it has been avoided because of the complications of planting and harvesting. This planting system usually benefits because of increasing in light interception, root contact with more soil, microbial activity and also as a deterrent to pests and weeds of other crop. Like other legumes, mung beans are high in protein, having around 25% of the seed dry weight and its amino acid profile is complementary to cereal grains. Mung bean is produced in tropical and sub-tropical rain-fed environments with little or no impounding of water, and it is prone to drought when soil moisture or rainfall is inadequate to meet plant requirements. The field experiment was laid out in split plot design with factorial design with three replications. Treatments included cultivation (pure mungbean, pure sorghum,50% mungbean+ 50% sorghum, 75% mungbean+ 25% sorghum, 25% mungbean+ 75% sorghum) as main plot and weeding weeds (no weeding, one time weeding, two time weeding). Analysis of variance showed that the effect of planting method and weeding on all characteristics was significant.

Key words: LER, mungbean, sorghum

INTRODUCTION

Increasing in agricultural productivity during the 20th century resulted from consumption of high levels of external inputs (Evans, 1998). Agricultural intensification, however, also produced some side effects, such as soil erosion, environmental pollution by agrochemicals and fertilizers misuse, and the appearance of agrochemical resistant

populations of weeds and pests (Vandermeer, 1993). Diversification of cropping systems, for instance, by increasing the number of crop species grown, has been proposed as a solution to some problems of modern agriculture (Altieri, 1999). Intercropping is being advocated as a new and improved approach to farming. However, it has been avoided because of the complications of planting and harvesting. This planting system usually benefits because of increasing in light interception, root contact with more soil, microbial activity and also as a deterrent to pests and weeds of other crop. Intercropping systems as an example of sustainable agricultural methods and objectives such as ecological balance.Interest the most out of resources.Increasethe quality and quantity performance and development decrease of pests.diseases and weeds traces (Fernandez et al., 2007). Intercroppingsystemsuse resourcesmore effectivelythana Mono cropping takes place andthereforethe amount of available materialforuseweeddecreases(Zimdahl, 1993).in Intercropping with increasing diversity in weed control is less and therefore the number of weeds per unit area decreases (Javanshir et al.2000). Intercropping uniform population of weeds by reducing the relative abundance of dominant weed population changes (Poggio, 2005; Asgharipour and Armin, 2010). The intercropping of cowpea with sorghum was observed ,The number of weed species was affected by irrigation levels and planting patterns, The least number of weed was achieved in control treatment and weeds significantly compared to pure sorghum (no weeding) decreased (SanJani. et al.2009). Also with increasing additive intercropping barley and faba bean densities were effectively controlled the weeds (Agegnnehu et al, 2007).biomass production and less density of weeds in intercropping crops in the supplementation is mixed that Increase their competitive ability with weeds towaste was reduced (Nielson et al, 2003) in intercropping Wheat and chickpea density and biomass weed significantly decreased Thus, compared to a wheat net in intercropping 69/7 percent weed biomass and weed density was reduced by 70 percent (Banik et al., 2006) in intercropping of maize and squash, weeds control of intercropping was more effective than monoculture corn (Ghanbari et al.2010). Intercropping is the cultivation of two or more crops at the same time in the same field. A wide range of crops can be used for intercropping (Gomez, 1990; Andow, 1991). Intercropping has some suppressing effects on most of the insect pests through the changed cropping canopy and resultant change in micro-climate (Jayaraj, 2002; Ijoyah, 2012; Degri et al., 2014). Intercropping which is closely associated with peasant agriculture is a practice that involves the growth of two or more crops in proximity, in the same field during a growing season to promote interactions between them. The main reasons for practicing intercropping by poor-resource farmers than monocropping include reduction in pests and diseases incidence, increase biodiversity, crop stability, risk spreading, food security, effective use of labour, increased crop productivity and erosion control (Willey, 1985; Uva, 1985; Trenbath, 1993; Gomez, 1990). Intercropping leads to the diversity of crops grown and reduction of plants of the same species is increased due to the planting of other crops between them, alteration of more beneficial insect pests especially when following crops are included in the cropping system and reduction of weed population (Patil et al., 1997; George and Jeruto, 2010; Ram and Singh, 2010). Multiple cropping offers one of the best ways of increasing production per unit area by growing two crops of dissimilar growth habit in the same field with little intercrop competition. Traditionally, intercropping is being used by small farmers to increase the density of their products and stability of their output. Cereal-legume mixtures have been adjudged the most productive form of intercropping since the cereals may benefit from the nitrogen fixed in the root nodules of the legumes in the current cropping year (Adu-Gyamfi et al., 2007; Undie et al., 2012). In this regard, there is a possibility of root exudates or the decay of roots and nodules causing the release of N from legumes into the rhizosphere during the cropping season. Legumes in intercropping could also provide N benefits to subsequent crops from the mineralization of N from their residues or from the N sparing effect, where a legume crop can fix atmospheric N2, thereby reducing competition for soil NO3- with a non-legume crop (Anil et al., 1998). The extent of competition-induced yield loss in intercropping is likely to depend on the spatial arrangement of the component crops. Spatial arrangement of intercrops is an important management practice that can improve radiation interception through more complete ground cover (Heitholt et al., 2005). Choice of appropriate population density, therefore, seems relevant management options in improving the efficiency of this system. Therefore, there is potential for higher productivity of intercrops when intra-specific competition is less than inter-specific competition for a limiting resource (Banik and Sharma, 2009). Arrangement of crops in mixture in the traditional farming systems of Hallaba and Taba areas, Southern Ethiopia is random and without any sufficient attempt to pattern the crops for effective interception of essential resources. Much of the poor crop yields obtained in traditional crop production systems of

these areas might be attributable in part to improper crop arrangement with its attendant waste of essential environmental resources. A wide range of legume-maize intercrops have been found to respond better to two rows of legume after one row of maize (Odhiambo and Ariga, 2001; Marer et al., 2007; Banik and Sharma, 2009). Philosophy of intercropping is improvement of resource utilization efficiency and increase production per unit area (Zhang et al., 2007). Kumar et al. (2008) concluded that soil surface remained moist in the intercrop during dry spell of 6-8 days when compared to sole maize cropping. Decline of external inputs and increased demand of home grown feed together with a more efficient nutrient use from leguminous symbiotic dinitrogen (N2) fixation (SNF) can result in a decrease of nitrogen and mineral losses. The main subject of intercropping is to augment total productivity per unit area and time, besides judicious and equitable utilization of land resources and farming inputs including labors (Marer et al., 2007). Mung Bean (*Vigna radiata* L.), a member of the Fabaceae family, is a tropical legume. It is a warm season annual, highly branched and having trifoliate leaves with plants varying from one to five feet in length. Mungbean seeds are primarily used for food purposes. They are a rich source of lysine and proteins, and thus can supplement cereal-based human diet. In Pakistan, the whole or split seed is usually cooked as dhal or boiled with rice (Rosaiah et al., 1993, Singh and Singh, 1992). Mung bean is the imperative nutritive predictor for survival among elders. According to a US study on 10000 people, mung bean reduced heart disease by 22%, chance of evolving colorectal adenomas was 35% less, and fibers in legumes have the ability to pool with bile acids resulting in lesser blood cholesterol. Mong bean contain very low amount of oligosaccharides, the sugar responsible for flatulence, beans are also source of protein (around 23%) suitable for delicate digestive systems and baby foods. Like other legumes, mung beans are high in protein, having around 25% of the seed dry weight and its amino acid profile is complementary to cereal grains. Mung bean is produced in tropical and sub-tropical rain-fed environments with little or no impounding of water, and it is prone to drought when soil moisture or rainfall is inadequate to meet plant requirements. It is an important pulse crop in developing countries of Asia, Africa and Latin America where it is consumed as a dry seed and fresh green pods (Karuppanapandian et al., 2006). Saleem (2006) who concluded that higher nodule dry weight plant-1 was recorded in sole mungbean cultivated fields while mungbean intercropped in maize registered lower nodule dry weight plant^{-1}. Similarly increased dry weight of nodule in intercropped treatment might be due to positive effect of cereal on mungbean nodulation. Maximum nodule dry biomass under intercropping system over pure stand of legume is an indication of more atmospheric nitrogen fixation in the crop mixture (Agbage et al., 2002). Higher nodule dry biomass may also be due to the “facilitative interaction” of intercropping (Li et al., 2003). Bhatti et al. (2006) who observed non-significant variation in number of grains pod^{-1} when mungbean was intercropped with sesame. Sorghum (*Sorghum bicolor*) is a multipurpose crop grown for food, animal feed and industrial purposes. It is considered more tolerant to many stresses, including heat, drought, salinity and flooding as compared to other cereal crops (Ejeta and Knoll, 2007; Ali et al. 2011a), however, the crop grown in rain fed areas is highly effected by drought stress (Kebede et al. 2001). Sorghum has an extensive range of adaptability and can be cultivated in different kinds of environments. Mostly cultivated for feed, food and industrial uses. It can also be used in the biofuels industry. Sorghum is an ideal crop for a more concerned crop improvement program in agriculture to utilize marginal lands, to meet food and energy demands which might be increased in the near future (Bibi et al. 2012). Sorghum has potential to compete with many types of stresses, including high temperature stress, water stress, salts stress and over irrigation (Ejeta and Knoll, 2007).

MATERIALS AND METHODS

Location of experiment: The experiment was conducted at the zahak which is situated between 31° North latitude and 61° East longitude.

Composite soil sampling: Composite soil sampling was made in the experimental area before the imposition of treatments and was analyzed for physical and chemical characteristics.

Field experiment: The field experiment was laid out in split plot design with factorial design with three replications.

Treatments: Treatments included cultivation (pure mungbean, pure sorghum,50% mungbean+ 50% sorghum, 75% mungbean+ 25% sorghum, 25% mungbean+ 75% sorghum) as main plot and weeding weeds (no weeding, one time weeding, two time weeding).

Data collect: Data collected were subjected to statistical analysis by using a computer program MSTATC. Least Significant Difference test (LSD) at 5 % probability level was applied to compare the differences among treatments` means.

RESULTS AND DISCUSSION

Ash

Analysis of variance showed that the effect of planting method on ash was significant (Table 1). The maximum of ash of treatments 75% mungbean+ 25% sorghum was obtained (Table 2). The minimum of ash of treatments 25% mungbean+ 75% sorghum was obtained (Table 2). Analysis of variance showed that the effect of weeding weeds on ash was significant (Table 1). The maximum of ash of treatments two time weeding was obtained (Table 2). The minimum of ash of treatments no weeding was obtained (Table 2).

DMD

Analysis of variance showed that the effect of planting method on DMD was significant (Table 1). The maximum of DMD of treatments pure mungbean was obtained (Table 2). The minimum of DMD of treatments 25% mungbean+ 75% sorghum was obtained (Table 2). Analysis of variance showed that the effect of weeding weeds on DMD was significant (Table 1). The maximum of DMD of treatments two time weeding was obtained (Table 2). The minimum of DMD of treatments no weeding was obtained (Table 2).

LER

Analysis of variance showed that the effect of planting method on LER was significant (Table 1). The maximum of LER of treatments pure mungbean was obtained (Table 2). The minimum of LER of treatments 75% mungbean+ 25% sorghum was obtained (Table 2). Analysis of variance showed that the effect of weeding weeds on LER was significant (Table 1). The maximum of LER of treatments two time weeding was obtained (Table 2). The minimum of LER of treatments no weeding was obtained (Table 2).

Dry forage

Analysis of variance showed that the effect of planting method on dry forage was significant (Table 1). The maximum of dry forage of treatments pure mungbean was obtained (Table 2). The minimum of dry forage of treatments 50% mungbean+ 50% sorghum was obtained (Table 2). Analysis of variance showed that the effect of weeding weeds on dry forage was significant (Table 1). The maximum of dry forage of treatments two time weeding was obtained (Table 2). The minimum of dry forage of treatments no weeding was obtained (Table 2).

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Table 1. Anova analysis of the corn affected by intercropping and weeding weeds

S.O.V	df	Ash	DMD	LER	Dry forage
R	2	0.041^{ns}	6.113^{ns}	0.598^{ns}	0.015^{ns}
Planting method	4	1.161^{**}	146.694^{**}	48.227^{**}	1.297^{**}
Error a	8	0.128	2.686	0.492	0.014
weeding weeds	2	16.012^{*}	331.721^{**}	84.773^{**}	1.387^{**}
Planting method*weeding weeds	8	1.499^{**}	111.368^{*}	1.521^{**}	0.245^{**}
Error b	21	0.154	4.189	0.413	0.012
CV (%)	-	8.36	6.15	13.87	10.32

*, **, ns: significant at p<0.05 and p<0.01 and non-significant, respectively.

Table 2. Comparison of different traits affected by intercropping and weeding weeds

treatment	Ash	DMD	LER	Dry forage
Planting method				
pure mungbean	4.80b	49.22a	0.63a	1.56a
50% mungbean+ 50% sorghum	4.52bc	26.28c	0.45b	0.78c
25% mungbean+ 75% sorghum	4.36c	25.04c	0.33c	1.15b
75% mungbean+ 25% sorghum	5.17a	35.20b	0.25c	0.79c
weeding weeds				
No weeding	2.97c	23.45c	0.30b	0.59c
one time weeding	3.60b	26.52b	0.34b	0.86c
two time weeding	4.74a	31.53a	0.42a	1.12a

Any two means not sharing a common letter differ significantly from each other at 5% probability

Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Optimum Placement and Sizing of DG Using Binary PSO Algorithm to Achieve Power Loss Reduction and the Minimum Electricity Cost for Consumers

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Received: 23 Mar 2015 Revised: 22 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

Nowadays placement of distributed generation units (DGs) is carried out to achieve a variety of operational or planning purposes. Minimizing the network losses, improving the voltage profile, reliability and economic goals, etc are several common goals. In this area, analysis of DGs location effect on electricity nodal prices in distribution networks rarely has been considered. In this paper placement and sizing of DGs to Achieve power loss reduction and the minimum electricity cost for consumers in a radial distribution network that operates under locational market pricing (LMP) rules, is carried out. Some operational and economic goals in a variety of scenarios are tested on a practical distribution network. A binary particle swarm optimization (BPSO) algorithm is used to optimizing the multi-objective optimization problem**.**

Keywords: BPSO Algorithm, Distributed Generation, Locational Prices, Optimal Power Flow, Loss Reduction

INTRODUCTION

Any source of electrical energy with limited size that is connected directly to the distribution system or on the customer side of the power network is defined as Distributed Generation (DG). Power source of DGs can be either renewable or non-renewable. Some sources like PV solar, wind, geothermal, mini-hydro and biomass are among the renewable sources. Whereas reciprocating engines, fuel cell, gas turbines and micro turbines belong to the non-

renewable category [1].The major incentive for re-appearance of DGs in power systems has been environmental concerns such as reducing the greenhouse gas emissions. Structural change in electrical systems toward deregulation of power markets is another reason to this [1].

DGs as promising new approach for obtaining system's demand have numerous potential benefits [1], [2]. They lead to lower power loss and better voltage regulation by reducing the distance from the power source to the load center [3]. Other technical merits of DG include releasing the system capacity, improving the utility system reliability and elimination or deferral of system upgrades [1]. DGs' main economical advantage is reducing the peak operating cost and thus decreasing real time prices in electricity market [2]. By supplying loads during peak load periods, when electricity cost is the highest, DGs can best serve as a price hedging mechanism [4].

The effectiveness of DGs in distribution systems deeply depended on the location and size of these units. However, determining the optimal size and sites of DG sources in power systems is not an easy task. Many researches have been carried out in these regard recently. Ref. [1] has presented a critical review of different methodologies employed in solving this optimization problem. It categorizes the various existing approaches and examined the benefits and the drawbacks of each approach. The various approaches that are used on the optimum DG placement can be listed as the meta-heuristic approaches such as genetic algorithm [5]-[7], particle swarm optimization (PSO) [8], [9], ant colony optimization (ACO)[10], [11], bee colony optimization (ACO)[12] and the analytical approaches[13], [14].

Also, some of proposed approaches are based on two-step or mixed procedures. In presented procedure of [15] the first stage uses a fuzzy approach to find the optimal DG locations and in the second stage, PSO is used to find the size of the DGs to reduce the losses. In [2] the best location of the DG is determined by using voltage index analysis and size of DG is computed by variational technique algorithm. Ref. [16] presents a new methodology using Fuzzy and Real Coded Genetic Algorithm (RCGA). In [17] first stage find the optimal DG locations using a single DG placement method and in the second stage, Artificial Bee Colony algorithm (ABC) is used to find the sizes of the DGs corresponding to maximum loss reduction. Ref. [8] proposed a similar approach, but in the second stage PSO is used to find the size of the DGs. In [6] the true Pareto-optimal and a multi-objective genetic algorithm have been used together to find the optimal location of DGs.

There are also different operational and economical aims for placement of DG units. In this aspect some researches have focused on technical benefits of DGs. In [10] a composite reliability index is used as the objective function for optimal recloser and DG placement in the distribution networks. Ref. [13] has shown that DG can be used to improve service reliability and thus reduce the customer interruption costs. In [2], [8], [15]-[17] choosing the best location and size of DG in distribution system is carried out in order to minimize the power losses and improve the voltage profile of the system. Ref. [18] presented a simple methodology for placing DGs with the view of increasing the loadability of the distribution system. Ref. [12] has calculated the optimal number, size and location of the DGs to simultaneously minimize the real power losses and violation function of contingency analysis in a transmission system rather than distribution network.

Some other studies have pursued also economic advantages of DGs. In [11] optimal sizing and placement of DGs is determined to minimizing DG investment cost and total operation cost of the system. Ref. [19] carried out optimal DG placement, based on a cost/worth analysis approach. This method considers technical and economical factors such as energy loss, load point reliability indices and DG costs, and particularly, portability of DG. Ref. [6] proposed an approach based on a multi-objective model in which the objectives are defined as minimization of monetary cost index (investment, operation cost of DG units and cost of losses), technical risks (risks of voltage and loading constraints violation because of load uncertainty) and economic risk due to electricity market price uncertainty. However, a few numbers of papers looked at this issue in an optimal power flow (OPF) based wholesale electricity market space, where the electricity prices are determined through locational market prices (LMPs). In [4], [20] DGs are assumed to participate in real time wholesale electricity market. Optimal DG placement, carried out to both social

welfare and profit maximization. The candidate locations for DG placement are identified on the basis of LMPs which derive from a primary OPF performed on the system without DGs. Thus in these studies, the LMPs that are derived from performing OPF after DG installation aren't used. Thus applied LMPs aren't fully reliable and thus maximizing of objective function won't be ensured.

This paper proposes a Binary Particle Swarm Optimization (BPSO) method to find the optimal location and size of DG units in a practical radial distribution system. Total load's payment as well as some other technical functions is optimized in different scenarios. A simple and efficient method is proposed for using real LMPs which obtained after DG installation in order to optimal placement and sizing of DGs. The proposed method is tested in a practical 13-buses distribution system.

Problem Formulation

Main Title and Author Affiliation

Optimal power flow as a popular procedure to determine the results of power market contains several series of information. The main goal of OPF is to make the best of existing property of power network that tends to minimization of power production cost or similarly maximizing the social welfare. The major piece of information obtained from an OPF procedure, is used to determine the main results of power market and contains the amount of power generation for each generator and the amount of power consumption for each load in double sided markets. The other important information derived from an OPF problem is known as lagrangian multipliers. Also the most important of these multipliers are ones associated with equality constraint of active power flow equation for each node that are known as Locational Market Prices or LMPs. LMP is the marginal cost of energy in each bus considering all technical constraints of system [4]. Thus it rationally can be used as electricity price in each node. LMP is generally composed of three components. The first one which is the same for all buses is marginal energy price, and the others are marginal loss and congestion components that deeply depend on the location of each bus in power system and thus are responsible for differences in LMPs. Higher LMP in a node implies that the generation is more pressed by demand at that node [4].

Electricity Price of DGs

Whereas the electricity production cost of DG units are higher than traditional power plants, they worth to be operated just in periods when the grid's electricity price is higher than DG's ones. Unless some incentives be adopted for DG owners. These incentives can be in the type of rebate in fuel price or in initial investment cost. In order to calculate the electricity price of a DG with generation capacity of C (MW) the following assumptions are made:

A natural gas-fueled, C kW Combustion turbine is the chosen DG technology. (C is considered 200,500 and 1000 KW)
The price of natural gas is 7 $/MillionBtu.
The DG will operate 19.2 hours per day, 365 days per year.
The DG has a ten-year life.
The electrical efficiency of the DG is 25%.
The total installed cost (TIC) of the DG system is 7,00 $ per kW.
The operation and maintenance (O&M) cost of the DG system is 0.5 cents per kWh.
The incentive program provides a credit of 30% of the total installed cost (TIC).

Based on the aforementioned information, the total cost of electricity generated by the DG can be determined as follow [1]:
The capacity factor (CF) is equal to the number of hours per year that the DG operates divided by the total number of hours per year (8,760).

$$CF = \frac{19.2\,hours\,per\,day \times 365\,days\,per\,year}{8760\,hours\,per\,year} = 0.8 \quad (1)$$

The fixed charge rate (FCR) is equal to the annual amortized installed cost ($/yr) divided by the total installed cost ($). In this paper, the inflation rate is considered as zero. Therefore, the amortized installed cost is simply one-tenth (ten is total amortization time) or 0.1.

The heat rate (HR) of the DG is calculated as (2):

$$HR = \frac{3413\,Btu/kWh\ \ (for\,natural\,gas)}{25\%} = 13652\,Btu/kWh \quad (2)$$

The total cost of electricity (COE) is equal to sum of the components for capital and installation (C&I), operation and maintenance (O&M), and fuel (F).

$$C\&I\,(\$/kWh) = \frac{TIC\,per\,kW \times FCR}{CF \times 8760\,hours\,per\,year} = \frac{700\$ \times 0.1}{0.8 \times 8760} = 0.01\$/kWh \quad (3)$$

$$O\&M\,(\$/kWh) = 0.005\$/kWh \quad (4)$$

$$F(\$/kWh) = FP(\$/Btu) \times HR = 0.000007\$ \times 13652 = 0.096\$/kWh \quad (5)$$

$$COE(\$/kWh) = C\&I + O\&M + F = 0.01 + 0.005 + 0.096 = 0.111\$/kWh \quad (6)$$

It is assumed that DGs offer the electricity price as 0.12 *$/kWh* or 12 *cents/kWh*. We implement DG placement for the peak period condition of distribution network, when the power demand and also LMPs are the highest. In order to implement OPF in a distribution network it should be noticed that the upper bus of distribution system, which is connected to the upper network, should be treated like a generator with high generation capacity. Also the relevant LMP of that bus is considered as the electricity price of mentioned generator. Whereas investment on DG should be cost-effective for the business owner, we considered the peak period LMP of upper bus equal to 16 cents per kWh that is also a rational amount.

The DGs can be treated as PV or PQ model in OPF problem. In this paper, PQ model has been adopted that DG delivers active and reactive power irrespective of the node voltage and practically DG is considered as a negative load [2].

Placement Formulation

The objective function of DG placement can be defined as minimizing the average price of energy for all consumers in the distribution network after DG installation. It can be defined as (7):

$$Price = \frac{\sum_{j=1}^{N\,j} LMP_j \times PD_j}{\sum_{j=1}^{N\,j} PD_j} \quad (7)$$

In this equation j is the bus index, Nj is the number of buses in distribution network, LMP_j is the locational price in bus j and PD_j is the amount of power demand in bus j.

Objective function can also be defined as a trade-off between Price and some technical features of system like loss or voltage index as (8) or (9):

$$obj_1 = \omega_1 \times Ploss + \alpha \times (1-\omega_1) \times Price \quad (8)$$

$$obj_2 = \omega_2 \times Vind + \alpha \times (1-\omega_2) \times Price \quad (9)$$

Which ω is weighting factor changes from 0 to 1 to determine the value of each component. α is a variable to assimilate the scales of two components and Vind can be defined as (10):

$$Vind = \sum_{j=1}^{N\,j} abs(Vref - Vj) \quad (10)$$

Which Vref is assumed as 1 p.u.

The most important constraints of DG placement are power flow equation which are known as equality constraints and assure the active and reactive power balance in each node of system, as (11) and (12):

$$\sum_{k=1}^{N\,k} \left(I_{j\,k} \times P_{DG\,jk}\right) - P_{D\,j} = v_j \sum_{m=1}^{N\,j} \left[v_m \left\{G_{jm} \cos\left(\delta_j - \delta_m\right) + B_{jm} \sin\left(\delta_j - \delta_m\right)\right\}\right] \quad (11)$$

$$\sum_{k=1}^{N\,k} \left(I_{j\,k} \times Q_{DG\,jk}\right) - Q_{D\,j} = v_j \sum_{m=1}^{N\,j} \left[v_m \left\{G_{jm} \sin\left(\delta_j - \delta_m\right) - B_{jm} \cos\left(\delta_j - \delta_m\right)\right\}\right] \quad (12)$$

Which k is the DG size index and N_k is the number of existing DG sizes. $P_{DG\,jk}$ and $Q_{DG\,jk}$ are active and reactive power of DG of size k which generated in bus j that assumed as fixed parameters. I_{jk} is a binary variable that shows the existence of DG at node j, by accepting value of 1 and is the main decision variable of problem. Ploss variable can be defined as the difference between total power generation and consumption as (13):

$$Ploss = \sum_{j=1}^{N\,j} \sum_{k=1}^{N\,k} \left(I_{j\,k} \times P_{DG\,jk}\right) - \sum_{j=1}^{N\,j} P_{D\,j} \quad (13)$$

Whereas the only power sources in distribution network are DGs that the amount of their produced power are assumed fixed, thus there is no generation limit constraint in the problem. Other inequality constraints are line power flow and bus voltage limits, according to (14) and (15) respectively:

$$-S_{jm}^{\max} \le S_{jm} \le S_{jm}^{\max} \quad (14)$$

$$v_j^{\min} \le v_j \le v_j^{\max} \quad (15)$$

That $v_j^{\min}$ and $v_j^{\max}$ are usually 0.97 and 1.03 in distribution systems respectively.

This modeling method lets us to define some other constraints according to what is expected from the selected DG places. As an example type1 variable can be defined as the total number of selected DGs of first size ($type1=\sum_{j=1}^{N\,j} I_{j1}$) and similarly for other sizes, the desired number of each DG size can be exactly imposed to the problem (for example $type1 \le N1$). Also a significant constraint is the number of installed DGs for each bus as follows:

$$\sum_{k=1}^{N\,k} I_{j\,k} = 1 \qquad (16)$$

This guaranties that only one DG can be placed in each bus.

As mentioned before, Price variable is derived from LMPs that are related to existing OPF. However LMPs aren't explicit variables in an OPF problem and can't be used during optimization step. In fact, they are some dual variables that calculated after the optimization step. Another important point is lagrangian multipliers of power balance equations that can be used as LMP or nodal electricity prices only if the objective function is a pure economic term such as total generation cost. Thus the lagrangian multipliers of placement problem can't be considered as LMP. In continue it is shown that PSO has the ability to handle these major difficulties.

BPSO Procedure

Particle swarm optimization (PSO) is a population-based optimization method first proposed by Kennedy and Eberhart in 1995, inspired by social behavior of bird flocking or fish schooling [21]. The PSO is an search-based optimization tool in which individuals change their position in a multidimensional search space. Each particle modifies its position according to its own best experience (Pbest), and according to the best experience of all neighboring particles (Gbest) which are determined by calculating the associated objective function of particles [9]. The modification of particles can be represented by the concept of velocity. Velocity of each agent can be defined by the Equation (17) [22]:

$$v_i^{k+1} = w v_i^k + c_1\, rand_1 \times \left(pbest_i - s_i^k\right) + c_2\, rand_2 \times \left(gbest - s_i^k\right) \qquad (17)$$

where v_i^k is velocity of agent i at iteration k, w is weighting function, c_j is weighting coefficients, rand is random number between 0 and 1, s_i^k is current position of agent i at iteration k, $pbest_i$ is pbest of agent i, and $gbest_i$ is gbest of the group. The weighting factor usually utilized as equation (18) [22]:

$$w = w_{\max} - \frac{w_{\max} - w_{\min}}{iter_{\max}} \times iter \qquad (18)$$

According to examinations, $c_i = 2.0, w_{\max} = 0.9$ and $w_{\min} = 0.4$ are appropriate values and do not depend on the problems [22].

The original PSO treats nonlinear optimization problems with continuous variables. However, practical engineering problems as well as DG placement are often containing discrete or binary decision variables. Kennedy and Eberhart developed a discrete binary version of PSO for these problems (BPSO) [23]. In BPSO the next state of each particle is determined according to agent's tendency to be zero or one. If the associated velocity is higher, the agent is more likely to choose 1, vice versa. This can be modeled as equation (19) [22]:

$$if \quad \rho_i^{k+1} < \frac{1}{1+\exp\left(-v_i^{k+1}\right)} \quad then \ s_i^{k+1} = 1; \qquad else \ s_i^{k+1} = 0 \tag{19}$$

Where ρ_i^{k+1} is a vector of random numbers of [0 1].

In order to check the feasibility of each new particle, they must be checked to satisfy all problem constraints. If the particle violates the limits, it should be disposed off. An easy solution for this is changing its associated objective function to an extreme non-feasible value not to be selected as Pbest or Gbest. According to aforementioned points, the BPSO-based approach for doing DG placement and sizing can be described as following steps:

Step1: Enter all information of distribution system (lines data, loads' demand, voltage limits, etc).
Step2: Set the initial values of decision variables randomly (I_{jk} in this case) and the initial velocities as zero.
Step3: According to each generated particles, perform OPF with the objective function of minimizing the total generation cost. As mentioned before it is assumed that the electricity prices of DGs and network are 12 and 16 cents/kWh respectively.
Step4: Calculate Ploss, Vind and Price variables as defined previously. Now calculate the objective function using (8) or (9).
Step5: Check system constraints (in this case, checking the feasibility of OPF and limitation of the number of DGs suffices). If any of boundaries is violated, the related particle is disposed off via mentioned procedure.
Step6: Compare calculated objective function of each particle with associated Pbest. If the objective value is lower than Pbest, set it as new Pbest.
Step7: Choose the minimum of all Pbests and set the related particle as Gbest.
Step8: Update the velocity and position of each particle using equations (17) and (19) respectively.
Step9: If the maximum number of iteration reaches, go to Step10. Otherwise, return to Step3 and start the next iteration.
Step10: save Gbest as the optimal locations and size of DGs.

As it can be seen from step3 and step4 the LMPs which are used to calculate the Price variable and finally to make decision for locating and sizing of DGs are:

Derived from an OPF problem with a pure economic objective function. Notice that the objective function of placement problem differs with the objective function of OPF.

Derived from an OPF that takes into account the selected DGs with their determined locations. Thus our decision is not according to the OPF that carried out without DG presence. This let us to make an exact choice.

Figure 1 depicts the flowchart of aforementioned procedure

The proposed method is tested with a modified practical distribution test system with 13 buses that is a part of Tehran's distribution system named Khodabande. Test system's rated values are 20kv and 30 MVA. System has a total active and reactive load as 10.54 MW and 5.99 MVar respectively, its single-line diagram is shown in figure2. Three parallel 1 MVar capacitors are installed in buses 10, 11 and 13. Table I and II show the branch data and amounts of load of buses respectively.
The results of optimal power flow on original test system without DG are presented in table III.

It is clearly evident that the voltages magnitudes are violated from the acceptable 3% tolerance that is usually adopted in distribution systems. It is assumed that the voltage magnitude in the upper bus is set to 1.03 p.u. The electricity price at bus 1 equals to 16 cents/kWh as mentioned before. The LMP in other buses is higher than 16 cents/kWh according to their distance from the upper bus. As it can be seen from table III the LMPs for buses 10 and 12 are the highest. In continue proposed technique is tested on this system in 4 scenarios. It is supposed that three sizes of DG are available as follows:

Size 1: 200 kW & 100 KVar
Size 2: 500 kW & 300 KVar
Size 3: 1000kW & 500 KVar

(Scenario-A) 5 DGs placement with no DG capacity limit:

In this scenario simultaneous placement and sizing of 5 DGs is performed. The amount of allowed DG capacity installation is assumed to be unlimited. The results for minimizing the variables of Price (case1), Ploss (case2) and Vind (case3) are summarized in table IV.

Figures 3 and 4 show the LMPs of buses and voltage profile respectively, before and after DG installation for optimum case and the other two cases.

As it can be seen from the figure 4 the case3 that is carried out to minimizing the Vind variable, has the smoothest voltage profile in comparison with the other cases.

As a last test in this scenario the optimal placement and sizing of DG has carried out for a multi-objective function according to equation (9) by changing the weighting factor from zero to 1. The results are shown in figure 5. Variable α is set to 0.01 in this case. It is seen that changing the weighting factor toward zero causes deteriorating Vind and also improving Price variable.

(Scenario-B) 5 DGs placement with DG capacity limited to 4 MW:
The results of this scenario are summarized in table V. The cases are the same as scenario A. It is seen from table V that the total capacity of selected DGs is limited to 4 MW. The reason for similarity of results in these three cases is that the objective functions in these cases are not necessarily in diverse directions. This point is especially true about two first cases. This implies that in such a radial systems the less power losses, the less LMPs increase.

(Scenario-C) 3 DGs placement with no DG capacity limit:

The results of this case are presented in table VI.

(Scenario-D) 5 DGs placement with specified DG sizes and numbers

The notability of this scenario is for such cases that the available DG sizes and number of each size are determined. Thus the results must harmonize with these conditions. This is easily possible by imposing some constraints to type1, type2 and type3 variables in placement formulation as mentioned in 2-3. As an example, placement of 2 DGs of size1, one DG of size2 and 2 DGs of size3 is carried out. The relevant answers are summarized in table VII.

Finally, the LMPs of buses derived from case1 of all scenarios are compared in figure 6. It is obvious that by increasing the amount of installed DG capacity the LMPs decrease significantly in comparison with no DG installation.

Optimal placement and sizing of DGs carried out in this study using a binary particle swarm optimization procedure. The procedure can effectively handle different kinds of DG placement and sizing. The proposed procedure is fast and precise to calculate the best place of DGs specially to achieve the minimum average cost of electricity for consumers. Electricity price of DGs calculated through some simple and comprehensive formulations. The electricity price of network is assumed to be equal to the LMP for upper bus of distribution network, which is derived from a main OPF carried out on transmission network. Because of lower electricity price of DGs in comparison with network's electricity price, they fully dispatched in system and cause a significant decline in LMP of buses. DG placement in transmission network with more focusing on lines congestion and even contingency analysis can be evaluated in future works.

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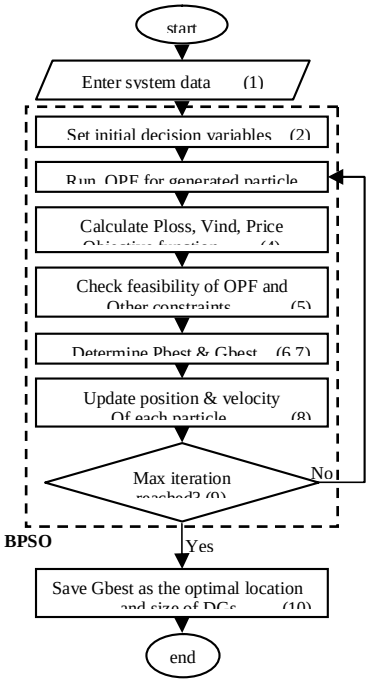

Fig. 1. BPSO methodology for DG placement

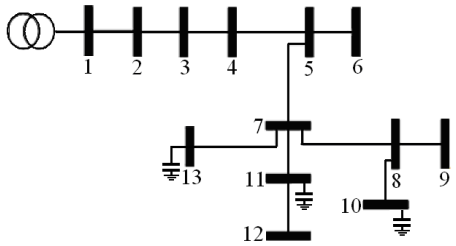

Fig. 2. The 13 buses practical distribution system

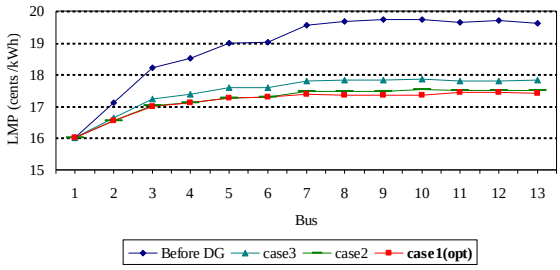

Fig. 3. LMPs of buses for all cases

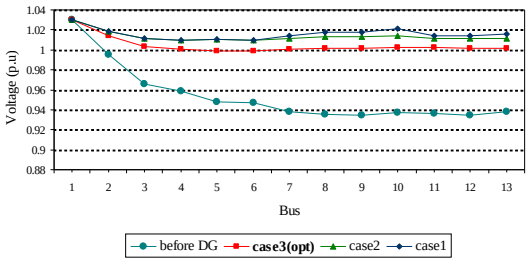

Fig. 4. Voltage of buses for all cases

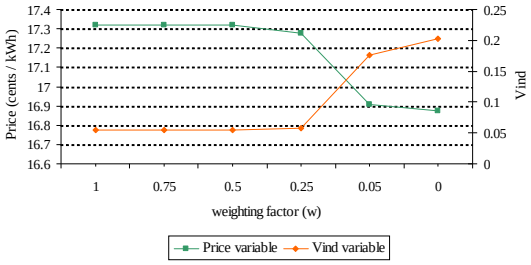

Fig. 5. LMPs of buses for all cases

I.1. (Scenario-B) 5 DGs placement with

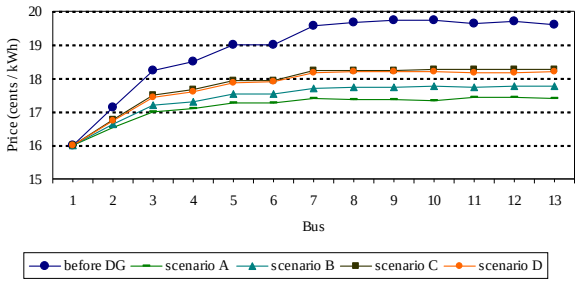

Fig. 6. LMPs of buses for case1 of all scenarios

TABLE I: Transmission Branch Data

From bus	To bus	R (p.u)	**X (p.u)**
1	2	0.0880	0.0690
2	3	0.0880	0.0690
3	4	0.0225	0.0175
4	5	0.0445	0.0345
5	6	0.0225	0.0175
5	7	0.0580	0.0455
7	8	0.0365	0.0365
8	9	0.0370	0.0290
8	10	0.0465	0.0465
7	11	0.0315	0.0250
11	12	0.0340	0.0265
7	13	0.0310	0.0265

TABLE II: Buses Active and Reactive Load

BUS	P (KW)	**Q (KW)**
1	0	0
2	890	468
3	628	470
4	1112	764
5	636	378
6	474	344
7	1342	1078
8	920	292
9	766	498
10	662	480
11	690	186
12	1292	554
13	1124	480

TABLE III: Results of OPF before DG Installation

BUS	Vm (p.u)	**LMP (cents/kWh)**
1	1.0300	16.0000
2	0. 9957	17.1184
3	0. 9656	18.2265
4	0.9588	18.5031
5	0.9480	18.9945
6	0.9474	19.0091
7	0.9377	19.5577
8	0.9356	19.6816
9	0.9341	19.7227
10	0.9370	19.7259
11	0.9366	19.6478
12	0.9345	19.7113
13	0.9379	19.6077
Vind = 0.661174		**Price = 19.166**
Ploss = 1.0081 MW		**Qloss = 0.792 MVar**

Table IV: Results of Scenario A

Placement objective	Min. Price (case1)		Min. Ploss (case2)		**Min. Vind (case3)**	
Results (locations and sizes)	**Location (bus)**	**Size number**	**Location (bus)**	**Size number**	**Location (bus)**	**Size number**
	8	**3**	**5**	**3**	**8**	**2**
	9	**3**	**7**	**3**	**9**	**3**
	10	**3**	**8**	**3**	**11**	**3**
	12	**3**	**9**	**3**	**12**	**3**
	13	**3**	**12**	**3**	**13**	**2**
Price(cents/kWh)	**16.874**		16.906		17.318	
Ploss(MW)	0.329		**0.324**		0.388	
Vind (p.u)	0.203		0.176		**0.055**	

Table V: Results of Scenario B

Placement objective	Min. Price (case1)		Min. Ploss (case2)		**Min. Vind (case3)**	
Results (locations and sizes)	**Location (bus)**	**Size number**	**Location (bus)**	**Size number**	**Location (bus)**	**Size number**
	7	**3**	**7**	**3**	**7**	**3**
	8	**3**	**8**	**3**	**8**	**3**
	9	**3**	**9**	**2**	**9**	**2**
	11	**2**	**11**	**2**	**11**	**2**
	12	**2**	**12**	**3**	**12**	**3**
Price(cents/kWh)	**17.310**		17.314		17.314	
Ploss(MW)	0.390		**0.387**		0.387	
Vind (p.u)	0.059		0.055		**0.055**	

Table VI: Results of Scenario C

Placement objective	Min. Price (case1)		Min. Ploss (case2)		**Min. Vind (case3)**	
Results (locations and sizes)	**Location (bus)**	**Size number**	**Location (bus)**	**Size number**	**Location (bus)**	**Size number**
	8	**3**	**8**	**3**	**9**	**3**
	9	**3**	**9**	**3**	**10**	**3**
	12	**3**	**12**	**3**	**12**	**2**
Price(cents/kWh)	**17.769**		17.769		17.781	
Ploss(MW)	0.491		**0.491**		0.493	
Vind (p.u)	0.180		0.180		**0.178**	

Table VII: Results of Scenario D

Placement objective	Min. Price (case1)		Min. Ploss (case2)		**Min. Vind (case3)**	
Results (locations and sizes)	**Location (bus)**	**Size number**	**Location (bus)**	**Size number**	**Location (bus)**	**Size number**
	7	**1**	**7**	**1**	**8**	**1**
	8	**3**	**8**	**2**	**9**	**3**
	9	**2**	**9**	**3**	**10**	**2**
	10	**1**	**12**	**3**	**11**	**1**
	12	**3**	**13**	**1**	**12**	**3**
Price(cents/kWh)	**17.785**		17.802		17.814	
Ploss(MW)	0.501		**0.499**		0.500	
Vind (p.u)	0.200		0.200		**0.197**	

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Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Study of Relationship between Antidepressants Interaction and Toxicity among Patients: A Case Study

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Received: 20 Mar 2015 Revised: 23 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

This study aims at examining the relationship between antidepressants interaction and toxicity among patient with antidepressant interaction. The essential information was collected in a year from the information in the health records of 108 patients admitted to Imam Khomeini Hospital due to the interaction of antidepressants caused toxicity. The existing drug interactions and their severity, according to Hansten & Horn's classification, were categorized in three groups: severe, moderate and mild drug interaction. The results indicated that there is a significant relationship between drug items and toxicity level caused by drug interaction, and with the increasing number of used drugs, patients are more likely to have severe toxicity. In addition to this, the maximum drug interaction was found among patients who used two different types of antidepressants (more than 60%), as the maximum interaction was observed among antidepressants groups of two drugs Tricyclic Antidepressant (TCA) & Selective Serotonin Reuptake Inhibitor (SSRI) (more than 32%), which had a significant relationship with severe toxicity among patients. finally, there was no significant relationship between gender and toxicity caused by drug interaction.

Key words: Drug, interaction, antidepressants, toxicity, gender, Tricyclic Antidepressant, TCA, Selective Serotonin Reuptake Inhibitor, SSRI.

Abbreviations

TCA	Tricyclic Antidepressant
MAOI	Monoamine Oxidase Inhibitor
SNRI	Serotonin–Norepinephrine Reuptake Inhibitors
DRI	Dopamine Reuptake Inhibitor
SARI	Serotonin Antagonist and Reuptake Inhibitor
SSRI	Selective Serotonin Reuptake Inhibitor

INTRODUCTION

Patient safety has been viewed as a fundamental concept of health care service provider system, and it has attracted growing attention in recent years. Numerous studies conducted by medical centers indicate that there is a high incidence of medical errors and a considerable distance between health care services; i.e. medication errors, infections and complications after surgery, inadequate cancer screening, and inappropriate care after heart attacks. Medication errors are the most common types of medical errors which are used as indicators of determining the level of patient safety in hospitals in a variety of countries due to its high incidence, prevalence and potential threats to patients. (Stratton et al, 2004)

Medication errors are defined as adverse effect and application of medicine which is preventable, though they can inflict harm on a patient (Hughes and Ortiz, 2005). Drug interaction is found to be one of the most important subsets of medication errors can lead to adverse reactions in patients. It actually occurs when the effects or toxicity of a drug is influenced by another drug (Hammes et al., 2008). The scope of the interaction may widely range from the failure to evoke any response to therapy, to serious and dangerous experiences. Even though the interaction can be either positive (increased efficacy) or negative (reduced efficacy, toxicity), it is not anticipated in drug therapy, so it is considered undesirable (Mouly et al, 2009)

According to the American Medical Association, medication errors claim 44 to 98 thousand lives annually, seven thousands of whom were died of negative drug side effects. About 6.7 patients admitted to hospital experienced adverse drug side effects, which resulted in 0.34 percent of patient deaths. In 2000 in United States, mortality from adverse drug side effects ranked fourth subsequent to cardiovascular disease, diabetes, and AIDS (Papadopoulos and Smithburger, 2010). Although, all drug interactions cannot be prevented, the awareness of medication team about the incidence of potential drug interactions, risk factors that increase the likelihood of the interactions, and drug interaction mechanisms would decrease the level of real drug interaction among patients admitted to hospital (Lima and Cassiani, 2009).

In the late nineteenth century, early observation of drug interaction was practically studied. However, the observation was not seriously addressed until after about half a century when early reports of drug interactions released in academic circles. One of the early reports was associated with tubular excretion and plasma concentration increase in salicylate through para-amino benzoic acids. Subsequently, many reports of favorable and unfavorable results of drugs concurrently taken published in scientific journals. This led to the separation of favorable results from unfavorable ones concerning drug interactions (Faraji, 2007). There are two types of drug interactions; pharmacokinetic and/or pharmacodynamics. Pharmacokinetic interactions affect drug excretion from the body which includes the effect of a drug adsorption, metabolism and function of another drug. Oral medicines undergo four basic pharmacokinetic processes in the body; adsorption, distribution, metabolism, and excretion. Drugs may change one or more stage(s) of the process in proportion to another drug in the body. Another category of drug interaction is pharmacodynamics which is synergistically and/or antagonistically recognized. Pharmacodynamic interactions are

linked with pharmacologic activities of interfering medicines. In this regard, plasma concentration of medications will not change. (Rahimi et al, 2012)

Risk of the incidence of interaction and its severity depend on various factors. Among the factors, we can refer to the number of prescribed medications, duration of treatment, age of patient, and stage of disease. Previous studies suggest that patients runs higher risks of severe drug interaction when several medicines prescribed for them, their treatment last long, they are old, or they suffer from certain diseases such as renal failure, shock, cirrhosis, and acute viral hepatitis. Other determining factors are thought to be contributing to the incidence of drug interactions, profile (property diagram) of pharmacokinetic and pharmacologic properties of drugs (Cruciol-Souza and Thomson, 2006; Mann, 2006). Drug interactions can also lead to the emergence of a new disease (Reeves et al., 2002), reduction of drug tolerance (Johne et al., 2002),and withdrawal syndrome, (Malek Ahmadi and Allen, 1995), which lead physician to misdiagnose the course of disease. in a study done by Mortaza Semnani et al (2002) in Iran, it was found out that there was an interaction between Imipramine- a tricyclic antidepressant (TCA), and Tranylcypromine- a Monoamine oxidase inhibitor (MAOI). Imipramine Also had interaction with fluoxetine and paroxetine from the group of selective serotonin reuptake inhibitors (SSRIs). Other Antidepressant drug interactions that were detected in this study are: Tranylcypromine with Levodopa, and Trimipramine with Sodium valproate.

According to the classification of Hansten and Horn (2008), drug interactions are classified into three classes in terms of severity:

Class 1; it takes on high clinical importance and there is reliable evidence concerning the interactions, as problems arises with high severity within 24 hours of treatment.

Class 2: it is of partial clinical importance, and we need further reports and evidence concerning the interactions. The interactions include delayed attack after 24 hours of medication administered.

Class 3: it is of low clinical importance, because there are very little reports and evidence and they have low potentiality for harming patients, as well as low levels of interference problems.

In order to rationalize the use of drugs, the evaluation of drug use effectiveness is considered a primary action. According to World Health Organization, trade, distribution, prescribing and use of medicines in a society takes place with special emphasis on its medical and economic outcomes in society and with special focus on patient care (Von Ferber, 1994).

Research conducted indicates that drugs can cause more interference when they have low “therapeutic index” or their “dose-response” curve is too steep. As for a drug with low therapeutic index, therapeutic dose is close to toxic dose as the smallest change in drug use dose can cause change in its excretion, absorption, and distribution, which results in plasma concentration increase and subsequently risk of drug toxic effects; antidepressants with low therapeutic index are included in this instance (Tamblyn, 1996).

Hence, the study attempts to review antidepressant interaction and drug toxicity in patients. What matters in the study is that whether there is a significant relationship between the number of drug items, type of antidepressants interaction, patient gender and the level of toxicity caused by drug interaction.

MATERIALS AND METHODS

The research is an applied study in terms of purpose, and it is a descriptive-analytical study in terms of method. Data collection was done in a year by reviewing health records of 108 patients admitted to Imam Khomeini Hospital due to the interaction of antidepressants caused toxicity. first, the health records of patients were checked, and subsequently data were recorded on a checklist contained first name, last name, gender, location, diagnosis, ward and number of bed, date of admission, date of discharge, prescribed medications, and instructions for drugs. Drug interactions observed in each visit were subsequently examined and the severity were classified into three classes of severe, moderate, and mild, according to Hansten & Horn's classification. Decision about drug interaction was taken by an expert. Drug interactions with antidepressants in different groups according to the group of pharmacological agents have been identified as follows:

MAOI & TCA
MAOI & SNRI
MAOI & PPA
MAOI & MIS
PPA & MIS
TCA & SSRI
TCA & PPA
TCA & MIS
SNRI & SSRI
SNRI & PPA
SNRI & MIS
SSRI & PPA
SSRI & MIS
TCA & SNRI

Research hypotheses:

There is a significant relationship between the number of drug items and the level of toxicity caused by drug interaction among patients

There is a significant relationship between type of interaction and the toxicity level among patients.

There is a significant relationship between gender and the level of toxicity caused by drug interaction among patients.

RESULTS AND DISCUSSION

In this section, we study data collected from the study sample, and then we analyze the research hypotheses using SPSS software.

Descriptive Statistics

Descriptive statistics of the research sample are shown In table 1.

Inferential statistics, Testing hypotheses

In this section, chi-square (X^2) test was used to examine research hypotheses. The larger X^2 value is, the more possibility of a relationship between two variables will be.

Hypothesis 1: There is a significant relationship between the number of drug items and the level of toxicity caused by drug interaction among patients

As seen in table 2, with the increasing number of used drugs, patients are more likely to have severe toxicity

As seen in table 3, According to the X^2 statistic value, degree of freedom, and p-value, it can be said that there is a significant relationship between variables at 99% confidence level. In other words, the null hypothesis is rejected, while the researcher hypothesis about a significant relationship between the number of drug items and the level of toxicity is confirmed because the X^2 value is greater than critical value. As a result, since p-value is less than 0.05, then the relationship is confirmed.

Hypothesis 2: There is a significant relationship between type of interaction and the toxicity level among patients.

According to table 4, the interaction of TCA with SSRI, had severe toxicity compared to other types.

Based on table 5 it can be concluded that there is a relationship at 99% confidence level according to the value of X^2 and degree of freedom. P-value is less than 0.05, the relationship is significant.

Hypothesis 3: There is a significant relationship between gender and the level of toxicity caused by drug interaction among patients.

The result of table 7 shows that the relationship is not significant. In other words, the research hypothesis about existing significance relationship between gender and toxicity caused by drug interaction is rejected, because the value of X^2 is smaller than the critical value and p-value is less than 0.05; as a result, the relationship is rejected.

CONCLUSION

In this research we examined the relationship between antidepressants interaction and toxicity among patient with antidepressant interaction In Imam Khomeini Hospital of Tehran. Results of testing research hypotheses revealed that firstly, there is a significant relationship between the number of drug items and the toxicity caused by drug interaction. Therefore, patients are more likely to have severe toxicity as the number of drug item used increases; Secondly, the maximum rate of drug interaction was found among patients who used two different types (classes) of antidepressants, i.e. more than 60% of patients. The maximum interaction was found among interaction of TCA with SSRI (more than 32%); which has a significant relationship to severe toxicity among patients. Thirdly, our other findings showed that demographic variables, such as gender, had no significant relationship with toxicity caused by drug interaction.

The results of the study can be compared with similar studies in this field. For example, in a research conducted by Mortaza Semnani et al (2002) it was found that with increasing the number of drug items, the level of drug interaction increase . These finding are in line with our results. In addition to this, research like Hammes et al. (2008), and Rafiei et al (2001) confirmed the relationship between high number of drug items and higher probability of drug interaction. also, in a study by Rafiee et al. (2011), it was revealed that there is a significant relationship between the

number of prescribed drug items and drug interaction. It seems that researches in this field agree with each other.On the other hand, in a research by Semnani et al. (2002), the maximum rate of drug interaction is attributed to Tricyclic Antidepressants (TCAs). The result is consistent with our results. It is also confirmed by Esteghamat et al. (2011). . In their study, they concluded that among antidepressants most interactions is related to TCI, and SNRI. In terms of relationship between gender and drug interaction, our findings showed no relationship between them but studies of Rafiei et al (2011) revealed that the number of drug interactions in males are more compared to females, while Lima and Cassiani (2009) showed that females are more vulnerable to drug interaction than males. It seems that the results of the studies conducted in this regard are not in agreement. Thus, there is a need for studies that can demonstrate the relationship of gender with drug interaction.

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Table 1. Descriptive statistics of the research sample

Measure	N	%
Sex		
Male	68	63
Female	40	37
Total	108	100
Age group		
Less than 25	27	25
25-45	49	45.4
More than 45	32	29.6
Total	108	100
Number of the used drug items		
2	26	24.1
3	33	30.6
4	20	18.5
5	14	13
6	15	13.9
Total	108	100
Interacted group		
with antidepressants	65	60.21
With antibiotics	18	16.66
With anti-anxiety drugs	15	13.88
With cardiac drugs	10	9.25
Total	108	100
Interacted group with other antidepressant drugs		
MAOI & TCA	1	1.5
MAOI & SNRI	1	1.5
MAOI & DRI	1	1.5
MAOI & SARI	1	1.5
TCA & SNRI	8	12.3
TCA & SSRI	21	32.3
TCA & DRI	4	6.2
TCA & SARI	1	1.5
SNRI &SSRI	5	7.7
SNRI & DRI	5	7.7

SNRI & SARI	5	7.7
SSRI & DRI	5	7.7
SSRI & SARI	5	7.7
DRI & SARI	2	3.1
Total	65	100
Toxicity due to drug interaction		
Mild	37	34.3
Moderate	38	35.2
Severe	33	30.6
Total	108	100

Table 2.statistics- the number of drug items and toxicity

Toxicity	**Number of drug items**					
	2	**3**	**4**	**5**	**6**	**Total**
Mild	5	5	3	0	1	14
Moderate	3	7	10	2	0	22
Severe	1	0	3	12	13	29
Total	9	12	16	14	14	65

Table 3. Chi-square test results of H1

	Results
X^2	46.462
df	8
P-value	0.001

Table 4. Statistics- type of interaction and toxicity

Toxicity	Type of t interactions with other antidepressant drugs														
	MAOI & TCA	MAOI & SNRI	MAOI & PPA	MAOI & MIS	TCA & SNRI	TCA & SSRI	TCA & PPA	TCA & MIS	SNRI & SSRI	SNRI & PPA	SNRI & MIS	SSRI & PPA	SSRI & MIS	PPA & MIS	Total
Mild	1	0	0	1	1	2	0	0	1	2	2	2	0	2	14
Moderate	0	1	1	0	4	2	1	0	3	3	3	1	3	0	22
Severe	0	0	0	0	3	17	3	1	1	0	0	2	2	0	29
total	1	1	1	1	8	21	4	1	5	5	5	5	5	2	65

Table 5. Chi-square test results of H2

	Results
X^2	46.777
df	26
P-value	0.007

Table 6. Statistics-gender and toxicity

	Gender		
Toxicity	**Male**	**Female**	**Total**
Mild	27	10	37
Moderate	19	19	38
Severe	22	11	33
Total	68	40	108

Table 7. Chi-square test results of H3

	Results
X^2	46.522
df	2
P-value	0.104

Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

An Investigation of Social Capital in Athletes

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Received: 13 Mar 2015 Revised: 24 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

Analysis of social capital state in each community is a necessary and important affair because social capital is helpful to understand how these social elements can enhance the performance of individuals Toreach different purposes. On the other hand, sport is a social and cultural phenomenon. The multi-dimensional phenomenon such penetrated and perforated in the world ofhuman life that today thought, lifestyle andthe social capital of individuals could be recognized based on the attitude and sport activities of individuals.To study the social capital of athletes, 200 athletes from 15 to 29 years inTabriz were selected using stratified random sampling and responded to the standard questionnaire of Onyx and Bullen social capital. Descriptive and inferential statistics (KS, T and ANOVA) was used fordata analysis. The results showed that the social capital difference in athletes is significant in terms of gender and occupational status but there are no significant differences in social capital of athletes depending on the type of exercise, age, marital and educational status.

Key words: social capital, gender, athletes, team sports, individual sports

INTRODUCTION

Social capitalis a new concept that in thepasttwo decades has attracted attention of science and research scholars and in particular sociologists to its own.The capital may have avariety of functions and out comes. In general, social capitalis of ten seen as a collective benefit, becauseitis also in the interest ofthe causative andbenefitof others as a product ofsocial relations. Thus, we cannot restrict concessions of social capital(1).

A man namedHani Fanapplied the concept ofsocial capital forthe firsttime in1920andafterhalf a century delay, Jane Jacob studied it againin 1960 due to livinginthe big cities ofAmerica and observe of American citizens' death.Look forhimin the 1970s, GlenLouri, criticand IvanLight,sociologist used the termforidentifying the social usefulsources,human capital developmentanddescription of the urbaneconomy problems(2).Social capitalis one of the multifacetedconceptsin the social sciences that is consideredscientifically and academically in the earlytwentiethcentury and from1980 entered to the political science andsociology texts .First, it wasdiscussed byJacob, Bourdieu,PasseronandLauriebut isexpandedbythose who like ColemanBart, Putnamand Portez(3).Bourdieu has beenproposed the firstsystematicanalysisofsocial capitalthat is the strongestanalysisamong the analyses that entered the concept ofsocial capitalinthediscourse ofclassicalsociology(4,5). Heidentifiedthree typesof capital such as economic, social, cultural, respectively (6).Although the social capital is a new and emerging concept in the field of social studies but it has root in human social relations.

Today, it is clear that achieving development, civil society, international standards and suitable context for social living is only formed in presence of social capital (7). Hence some sociologists such as Coleman knows social capital contains an aspects of on social construct that facilitates the relationships and interactions of individuals who are within the structure and is generator and creator Like other forms of capital and make possible to achieve certain goals that weren't attainable in its absence (8).In the present era, exercise as amultidimensional device leavesgreatimpacts in different areas.Today it reflects its role inhealth ofpeople, having healthy, joyfulandenjoyableleisure time, education especially in theyounggeneration, creation ofhealthysocial relationshipsin the community, prevention ofdiseases,preventionofcorruptionand social obliquities. Exerciseis oneofthe ways that helppeople to overcome onphysical, mental psychologicaland social pressures resulting from living in the presentturbulent and stressful world(9).

Socialization ispart of the humanpersonalitydevelopment whereby thepersonprefers group values to theindividual values andreplaces it to the individual values.Therefore, development ofsport activitiesin societyandpropel of peopletoparticipate in theexercise can reducestress, social order disruptiveemotionsandbehaviors, demonstration ofcollective and in particularnationalidentity, respect for the socialrules and provision of physical health.So, today, inallhuman societies, sportis considered as a human-educative affair and appliance of universalsocial and even economicphenomenonofpower and politicsinthe international community. Sothat do exercise isvitaltopeopleinindustrialized societiesandneed oftodaycommunities to healthyhuman resources is tangible morethan any other time.On the other hand, in communities wherethere is alackof quality and quantity inthe field of sport, the society is retarded in many ways. That is whyit is studied and assessed in the developed countriesof the world asasocial and psychological phenomenonand an important economic factor in addition to itshealth effects and importantroleindetermining the health of nation(10).Sportis asocial and culturalphenomenon,which it has promptedpeople tointeract and engagement in a social network that hascomplexsocial relations and becomes theemergence contextof behaviors, attitudes,values and meaningfulrepresentations ofthe present century. Themulti-dimensionalphenomenon such infiltratedandpenetrated in the world ofhuman lifethat today, thought, lifestyle andsocial capital ofindividualscould be recognized in accordance to theattitudeandsport activities of individuals (11).Itplays an important roleincreation of social capitalandhelp to thecommunities,trust development, openness andrespect for different individualsandgroups.Thiscan lead to more cooperation and higher levels ofunityandsocial cohesioninthosecommunities. (12).Sportis considered as a deviceforaccumulation of the social capital, which, in turn,

it improved civic pride, identity ofcommunity, powerandconsistency and significantly assisted to thetrust and interactions. In this regard, it helps to overcomebarriersandcultural differencesandto contribute in publichealth is valuable (13).Ageisoneofthe factors affecting theformation ofsocial capital. It usually is knownbased on thechildhood, adolescence, adulthood, parenthoodandretirement. Socialparticipation of individual atdifferent age levels is different since age is different invariousperiodsbased on income and leisure time(14). Glaicerin his research(2000) has shown that the agevarioableplays an important roleinsocial capitaland curve of thesocial capital relation with age isin the form ofan invertedU(15).However,due to parallel changeof age with income, education, job opportunities, familyandmaritalsituations variable, we cananalyzechange in thelevel ofsocialcapitalindifferent ageperiods(14).

Studies show thatthere is a significantrelationship betweensocialcapitalandemployment status and the employed have more association activity than the unemployed ones. For example,knitter, weaver andaccountingstaffhas thelowest levelsof social abilityanddoctor, policeandclergyhas the highest levels of socialability (14).Gender isothervariable that affect onsocialcapital, sothatmore participation ofmen than womenin the labor forceincreased their official contribution toward women.Sex also affects onthe type of forum membershipin a waythatwomenmore participate in servicing -charitable, church, PTAandcultural associationsandmen are interestedto participate inpoliticalassociations, on the other hand, researchers such as Spellerberg ,Esetone,HughesandPutnamare consideredgenderas a factoraffecting thesocial capital(14). Putnam who is the most famous theorists of social capital argues that most of sports due to their nature are relational activity and participation in sport include informed participation of individuals as participants and spectators ,which have interrelations with each other and in effect of this interaction , social rewards exchange between them.He defines social capital as the relationships between individuals that represent certain features of social life like networks, norms and mutual trust and sub product of social interactions that it makes cooperation of these interactions easier and more likely for participants (16).

Harris(1998) says thatexercise canbe usedto promote newrelationships and friendships and social communication that often is in classormoralandreligiousboundaries. Thiscould includeplayers, non-player participants(e.g., teachers) andthe audience and resulting in an increaseofthe trust andreciprocitynorms. In other words, exercisecreatesconnectionsbetweendifferentsocialgroups and networks(17).

Interesttoexamine the relationship betweensocial capitalandsport is growingwithemphasis on thesport role in promotingsocial communication. Uslaner(1999) andPutnam(2000) alsohavean interestinthis area, from their view, participate insportusually withprovidingopportunities forpeopletoleads tothedevelopmentof social trustand generalization of the interaction norms (18,19)

ParsaMehr and Turkan(2012) in a studyby title ofSocial CapitalandSports participationof nursesachieved to the results that betweensocial capitalandsports participation levelsof nurses has significant relationship, also there isa significantrelationship betweentrustandsecurity,social interactionwithsportsparticipation(20).

Safiri and Sadafi (2012) ina study as meta-analysisof gender and social capital researches andstudieshave concludedthatbetween there is a relation betweensexand social capitalandsocial capital of men is more than women(21).

In addition, Afshani and colleagues(2012) ina studytomeasuresocial capitalamong students ofYazd andIsfahanUniversityfound that thesocial capital ofmalestudents was more thanfemaleones and between thestaffwasmore thanr unemployed. There is a significant relationshipbetweenage variableandeducational status with socialcapital(14).

Kamran (2010) inastudyentitled with study oftherelationship between networksocial capitalandmental healthfoundthat the marriedworkershas more social capitalandmental health(22).

Findings of Sharepourand Hosseini Rad(2009) in investigation of the relationship between social capitalandsports participation(case study of 15-29year oldcitizensof Babol city) showed that the components of friendly relationships, trust to friends, trust to neighbors, neighborly relationsanddovolunteer works have significant correlation withsports participation(1).

In research ofFirouzabadi(2005) that is done in theSupreme Cultural Revolution council,the obtained resultsare as follows: education is one of theaffecting factors of the social capital. Middle ageswith amean age of 51yearscompared to young adultswitha mean ageof25yearshavehighersocial capital. Men have more social capitalthan women (23).

Rosso (2012) in a studywith title ofbeyond the entertainment and fun: personalsocial networksandsocial capital in transferof young playersfrom therecreational soccer toofficialclubs of soccerachievetotheresults that there is a relation between the progress ofplayersandsocialcapital. Social capitalcan have both negative and positiveeffect on progress and promote of players.Social capital canlead to developmentthrough the strong social networks by connecting to the culturalcapital.

On the other hand,the negative consequencesof social capitalincludeconsiderationofsocioeconomicstatus, ethnicity, cultureandgender discriminationoccursthroughsocial networksthat impedesuccess and progress of players.Womensuffer more from this negativeaspect, whichcould be due togender discriminationinsports.(13)

Clopton(2012) in an articlewith title of "social capital, genderand athletic student"achieve totheseresults that there isa significant relation between sex of athletic students andtype ofsport(individualsport andteam or group sports). Based on the results of thisstudy,female athleteswho were inteam sportshave more social capital than the women who were inIndividual sports but maleathleteswhowereinindividual sports havemore social capitalthantheteamathletes(24).

Ottson, Jeppesenand Krustrup(2010) in their studyassocialcapital developmentthrough soccerandrunningoninactivewomenachieve totheresult thatboththese exercisesdevelopsocial capitalbutsocialcapital developmentthrough soccerandrunningis different.Social capital increases morethroughgroupsportslikesoccerthanthe individual sports. In fact, theadvantageof groupsportsinsocial capitaldevelopmentismorethan the individualsport (25) .

Aiharaet al(2009) in a research with title of thesocial capitalrecognitionin elderlywomen and menconcludedthatcognitive social capitalinolder men is more than olderwomen(26). .Schultz(2007) inan article with title of tennis rolein creation ofsocial capitalconcluded that: tennis as an individualsportcreatesmoresocialcapitalperunitofactivitythan theteam sports (27).

DelaneyandKeaney(2005) in a study entitledSport andSocial Capital in theUK comparesportsandsocial capital withother European countriesandrefertothe relationship betweensocial capitaland Sports(28).Tonts(2005) in a study entitledcompetitivesportandsocial capitalinthe villages ofWestAustralianotes that there is a significantrelationshipbetween exerciseandtheir access tosocial capital. This papershows thatexerciseisanimportant arenafor creating and maintaining ofsocial capital(17).

Whatattract attention of sport scholars tothe social capitalis thatthe type and amountofpeople's social interaction in the field of sport havewhatsocial and economic consequencesfor the community. Theresearchersfound that the active people in the field ofsports have moresocial capital than the inactive ones (29).Unfortunately,many studies havebeen conductedin various fields but few researches have been done in the area ofsocialcapitalandexerciseatdifferent levelsin particularelite athletes.The present studyexaminessocial capital inathletesbasedongender,sport type, employment status, marital status and age.

MATERIALS AND METHODS

The research is applied and descriptive- survey. With respect to the functions and effects of exercise and social capital in social life of people, the present study aims to investigate the social capital in the athletes.

The statistical population of the study included all athletes of sports teams (15-29 years) in Tabriz in 2013-2014 year. 100 female Elite athletes and 100 male elite athletes from different sports including individual strands (Taekwondo, karate, table tennis, swimming and badminton) and team (soccer, futsal, volleyball, handball, basketball) were selected using stratified random sampling and the necessary information were collected using the Onyx and Bullen (30) standard questionnaire.Cronbach alpha of questionnaire in thestudy populationis0/81.So the present study has acceptable stability. In addition, the questionnaire has acceptable validitybased on the study ofphysical education professorsandsociology. The Kolmogorov-Smirnov testwas used to evaluate thenormal distribution ofvariables 'scores that the resultsshowedallvariableshavenormal distribution.

RESULTS

The obtained results from theindividualproperties of the statisticalsamplein the study showthat among athletes ,education level: 21.5percent were under diploma, 31.5percent werediploma, , 6 percent were associate degree, 35/5 percent were bachelor, 5.5percent wereBAor higher.One hundredofthe participantswere women and100were men. Forty-seven persons werein the age groupof 15 to19years, 69 peoplewere 20 to 24yearsand84 people were in the age group of 25 to 29 years old.

As it can beseenin Table1, based on t-test results, social capitalamongmale athleteswassignificantlyhigher than thefemale athletes (p=0/001). Theresults showed social capital ofteamathletes have nosignificant differences with individual(p=0/804).Few differencebetweenmarried and singleathleteswas notsignificantinterms of social capital(p=0/428). The present different between unemployed athletes and employed ones in amount ofsocial capital significant(p= 0/001)andemployed people have more social capital.

For study of hypothesis, one-directional varianceanalysis was used tothat theresults showeddifference of people insocial capitalwithdifferent educational levels(p=0/403) is not significant.

The obtained results of one-directional varianceanalysis showed that there isno significantdifferences insocial capitalof different age groups(p=0/186).

DISCUSSION

The purposeofthis studywas toevaluatesocial capital statusinmale and femaleelite athletes. Asshowninthe present study, amount of social capitalamongmale athletes issignificantlyhigherthan the female ones. Therefore,thestudyconfirmed thatgenderhasa significantimpactonsocial capital that is compatible with the results of Safiri and Sadafi(2012), Seidanand Abdul Samadi(2011), Bastani andSalehi(2007) Afshani(2012) andAihara(2009) researches but is not consistent with Clopton(2012) study. The cause of this misalignment back todifferentresearch environments, socialandcultural differenceswith theresearchstudy. The originofgender differences insocial capital is rooted in thesocial structure that is the result of social and culturalcontext, which has createdmuch discrimination.Existence of specialand differentexpectationsfrom women toward menintensifiestheir relative deprivations in the social network. The phenomenon prevent womanfrom wide relationsbased onmutualtrust and interactiontypesthat areavailable for men. Therefore, withappropriateculturebuilding can improvethediscriminations.Based on theresearches, one of the negative consequencesof social capitalissexismthat is

obvious in sport(31). Thesexismin sport of our country especially in the area ofchampionship and professional sport canbeseen.

In our society, women due tothe present cultureand positions do not have equalopportunities with men .In the field ofsport, existingfacilities forwomenis less than the men have.Therefore, we suggest women, like men, have the same opportunityandfacilitiestomeettheircompetence. formation ofthewomen Leagueinvarious fields, professionalcontracts, increasingwomen's sportscapitalare factors thatimprovethepositionof women insport. The obtained findingsofthe hypotheses testing showedthatthesocial capital among theatheletes of individualcoursesandteamsportsis not significant, which is not consistent with the results of Colpton(2012),Ottesen(2010), Schultz(2007) andSeippel(2006) researches.schultzconcluded thattennis asanindividualsportcreate more socialcapitalperunitofactivitythan theteam sports and in accordance toPutnam(2000) andOttesen(2010) results, team sportsdevelop social capitalmore than the individualsports do.According toourfindings,there isno significant differencebetweenindividual and teamsports. AsTontsstatedinhis findings,there is ageographicalaspecttothe relationship betweensocial capitalandsport.Thetool and device of evaluationandtheanalysis level are impressive in the studies too. In justification of non-alignment can considerdifferent measurement tools, differentgeographiclocation andsportfacilities of countries and based on Seipel(2006) idea considerthe sport governance structure of countries.Also inthestudyin contrast tothe aforementionedstudies thatwerelimited toa particular individual and teamsport, various typesof individual and teamsports were evaluatedthat couldbe thereason of thestudy's misalignment with theprevious ones.

Based onthe otherfindingof the study, social capital of the employed peopleisgreater than theunemployed ones .Difference between theemployed and unemployedpeoplein term of social capital has been obtainedin other studies of Nateghpour (2005), Afshani(2010) and Safiri(2011).While some researchers have shown that individualsin occupations that are more social able have greater social capital. Further efforts of officials to increase the employment rates especially amongyoungathletesandeducatorscan bean important andpositivestepinraising social capital.

Thestudy showedthatthere was no significant difference insocial capitalofathletes based on marital status, which was consistent withstudy of Parsamehr, (2012) whofound there was no differentbetween the social capital of married and unmarried nurses. Considering the findings of other researchers in this field have shown that marital status has a significant impact on social capital that it is recommended to do more researches on the athletes.

According to this study, there is no significant difference in social capital and educational status of athletes, which is consistent with the study of Afshani (2011).

Another finding of the study showed that there is no significant difference between various age groups in terms of social capital that is not consistent with researches of Firozabadi(2005) andAfshani(2011) whofoundthere is a relationship between the social capitalandage.Asresearch has shownthat, theage variable plays an important roleinsocial capitaland curve of thesocial capitalrelationship with age is in the form of a reversed U.Atfirst,they invest on thesocial capital formationwithincreasing ageand then with increase of age from one level, the investment on the social capital decreases (32). Thus lack of difference based on the age in social capital of athletes could be the result of the subject that tests were at the same stage namely in youth.

Finally, according to the results ofthis studythat showed thesocial capital in athletes isinfluenced bygender, so itis suggested to provide equalopportunitiesfor womenand men likemore hours ofexercisegym. In addition, with creation of special sport spaces for women, support of women's sports, holding of cultural, recreationandvoluntaryprograms for athletic women provide suitable context for their participation and increase

their relationships in the sport community. The results showed that thesocial capitalis notdifferent based on the type ofexercise,so with both individual and team sports can increase the development context ofsocial capital in the community. It is suggested that the governmentsinvest equally on boththese exercisesat all levelsof sports participation.

In addition, duetodifference of the employedathletes'social capital with the unemployed ones, officials' shouldcreate jobopportunitiesto increaseemployment rates especially amongyoung and educatedathletes and have led toan important andpositivestepinenhancement of social capital.

ACKNOWLEDGEMENTS

At the end, researchers expressed much thanks to all people of the Tabriz, Iran, who participated in this study.

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Table1: Independent T-testresults to comparesocial capital in athletesbased on gender, marital andemploymentstatus.

Dependent variable	Independent variable	number	mean	Standard deviation	Levine test		T-test		
					Statistic F	Meaningful level	statistict	Freedom degree	Meaningful level
Social capital	male	100	5/17		0/08	0/767	3/54	198	**0/001
	female	100	4/56	1/26					
Social capital	single	166	4/84	1/21	0/094	0/760	-0/794	198	0/428
	married	34	5/01	1/27					
Social capital	unemployed	120	4/61	1/25	0/195	0/660	-3/501	198	** 0/001
	employed	80	5/23	1/24					
Social capital	Individual sports	100	4/87	1/28	0/955	0/330	0/294	198	0/804
	Team sports	100	4/84	1/26					

Table2: Results of one-directional variance analysis testforcomparisonof social capitalin theeducationalgroups

	Sum of squares	Freedom degree	mean	f	meaningfulness
Between group variance	6/47	4	1/62	1/011	0/403
Intra-group	311/78	195	1/60		
Total	318/25	199			

Table3: results of one-directional varianceanalysis to comparesocial capital inage groups

	Sum of squares	Freedom degree	mean	f	meaningfulness
Between group variance	5/39	2	1/62	1/70	0/186
Intra-group	311/78	197	1/59		
Total	318/25	199			

Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Providing Relief in Critical Urban Areas with Multi-Criteria Decision-Making Models (Boroujerd City)

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Received: 05 Mar 2015 Revised: 26 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

One of the most important and fundamental issues in urban planning is the optimal land use and planning the urban land uses. The allocation of lands to various usages should be so that all city residents are able to access to them with minimum cost possible. Today, with the population increase in cities, constructing tall buildings and development of apartment life, industrial concentration, development of poor neighborhoods and unrecorded residence, numerous women and children and disable or elderly people, an improper context is provided which may lead to crisis at the time of accidents or natural disasters in cities. Among all these natural disasters, earthquake is considered the most destructive. Since the central and western regions of Iran are earthquake-prone and considering that some earthquakes have occurred in the aforementioned regions during recent years, recognizing the characteristics of natural environment to discern and find the optimal site for constructing urban buildings and relief centers seems mandatory. The aim of this research is to locate the areas for establishing relief centers and temporary residence of population at the time of earthquake. In this article, multi-criteria models are applied to locate the aforementioned places in terms of physical, environmental and social measures to rescue the injured people immediately after earthquake and provide a temporary shelter for them. The obtained results reveal that connection lines, lithology, distance from the river, topography lines, slope and its direction are some of the effective factors in locating relief centers which are consistent with stable development indicators. The results of model indicate that the measures of slope and distance from the river with coefficients of 1 and 0.77 respectively are the most crucial factors in locating relief centers.

Key words: Crisis management, urban planning, relief centers, MCDM

INTRODUCTION

Locating is a long-term decision-making process, since a high number of indicators should be tested and the possible outcome of the decisions have to be thoroughly evaluated (Parhizgar, 1997). Appropriate locating is possible if a meticulous, homogenous, and quick evaluation of the attraction of various places takes place for special usage; locating is a part of spatial and urban planning (Khodabakhshi, 2006). In urban planning issues, one of the topics which is both a subsequent of various variable and a combination of integrated and coherent variables is locating the temporary residence sites which are introduced by four groups: emergency shelter, temporary shelter, temporary residence and permanent residence (Nag et al, 2006). Despite considerable advancement of technology and achieving what was considered impossible in past centuries, human being is still so powerless against unanticipated natural disasters such as earthquake, flood and famine and is exposed to drastic damages occasionally (Binesh, 2007). Confronting with these natural disasters and trying to reduce its negative impacts have caused the 1390 decade to be named "the decade of reducing natural disasters impact" (Nojavan et al. 2013). A fundamental fact about these disasters is that one cannot take much action facing with such events, while its effects can be reduced or removed by prior planning (Ahad Nejad et al. 2011). Since our country is located in Alps-Himalaya orogenic belt and having unstable climate, have exposed many natural disasters in its cities throughout the history, especially earthquake and flood (Abdollahi, 2004). The most significant aim of this research is to locate the areas for establishing relief centers and residing the population temporarily after earthquake. Considering the subject of the research which is locating relief centers, it is possible to locate the relief cites considering the natural critical factors and avoidance of hazardous condition. In fact, the threatening factor of natural disasters (earthquake, flood, landslide, etc.) is the lack of human's preparedness for facing with them. In this part, some of Iranian and foreign references which considerably contributed to completion of the present research is briefly pointed out.

Zebardast and Muhammadi (2005) in their article: "locating relief centers in earthquake" used multi-criteria evaluation to locate relief centers at the time of earthquake in region 11 of Tehran municipality and examine its susceptibility. In another study, Samadzadegan et al. (2005) has applied fuzzy logic to make decisions for determining the direction of locating process. Nayer Abadi and Kouh Banani (2010) in their article with the title of "locating residence sites for survivors of Neishabour earthquake using GIS and AHP software", applied the widely used AHP to locate the temporary sites of injured people in Neishabour earthquake. Using three macro indicators: use, urban open spaces and communication network each of which contains some indicators, determined the proper areas for temporary residence of the injured. Most of these areas have enough space to do so and can be applied as open spaces, such as amusing parks. Jifu Liue (2011) studied the earthquake of China in 2010 with magnitude of 7.1 on Richter scale which claimed 2698 lives and explained the effective factors in escalating the damages to the areas and discussed the reconstruction and restoring the region to its state prior to earthquake, and the role of state organizations and institutions in providing relief for damaged people.

Concepts, views and theoretical principles

An accident is something that jeopardizes and destroys the ordinary pattern of life or ecosystem in an unordinary way (Raheb, 2005). Crisis is an unexpected event which is arisen from a natural, technical or social factor and its consequences are destruction, casualties and chaos (Zib Arzani, 2013). The occurrence of an accident is followed by crisis. Crisis is the situation in which the discipline of main system is distorted and its stability is jeopardized. In order to eliminate the crisis, the concept of "disaster management" is defined (Asadi, 1991). Crisis management is a process which can prevent the crisis occurrence after the disaster or at least reduce its impact by taking necessary actions, quick relief and improving the situation till the conditions become ordinary (Eshraghi, 2007). In fact, crisis management is the set of theoretical concepts and practical policies related to planning in order to confront with disasters at the time, before and after its occurrence. This term involves the methods of crisis management and its consequences (Aysan and Davies, 2003). The crisis management process includes three essential steps: preparedness

for disaster, providing relief, and taking the responsibility in disaster condition and reconstruction afterwards (Ocha, 1995). Preparedness includes actions for limiting the effects of disasters, and providing relief is composed of all actions which are taken during the moments after the disaster (Nateghi, 1998). What happens at the time of disaster will bring social damages as well as social and life damages. Therefore, in order to decrease social and psychological damages and providing shelter to reside the injured ones temporarily, emotional and psychological issues, maintaining remained assets, focusing on land property and also usage of remained human resources to provide aid and construct the damaged area should be considered (Mousavi et al. 2011). Time is a very critical factor in disaster management. The process of crisis management is carried out in three time intervals: short-time, mid-term and long-term. The short-term stage starts immediately after the disaster and continues till one or two weeks later (Bahraini and Akhundi, 2000). One of the most important duties of policymakers of crisis management section in any planning and executive system is to predict the places for emergency and temporary residence, since the damaged and bereaved ones which have no shelter are exposed to serious physical, spiritual and psychological damages (Husseini, 2008). Dr. Brenda Phillips in her book "compensating the disasters" states that residential buildings may not be affordable prior to disaster. The occurrence of disaster allows the community to prioritize the construction of affordable residence (Phillips, 2009). So, passage of time can positively affect the construction process because the essential construction process is not possibly able to redevelop the land immediately after the disaster (Piran, 2005). Borujerd has three hazardous faults and many of its buildings are not strong enough. According to conducted studies, 2006 earthquake claimed 63 lives and injured over than 1450 people of Borujerd and Doroud. Another estimate declared the number of casualties 70 and the injured 1300 people. The oldness of residential buildings in Borujerd city and its villages caused the destruction of numerous houses. So, it should be pointed out that regarding the magnitude of earthquake force, any structure connected to the land which is placed on a fault cannot withhold this force and will collapse. The examination of previous studies can contribute to recognition of the research topic to match the study purposes.

RESEARCH METHODOLOGY

The research method is survey analytical and present documents as well as field and local studies are applied for conducting the procedure of the research. In data analysis phase, GIS is used due to the nature of research and its study field (urban planning). Then, the obtained data are classified, recovered and analyzed by connecting local data to the descriptive data and utilizing ANP method facilities. The model analyzes the current state and also produces maps which display proper places for constructing relief centers and temporary residence. The most important indicators extracted from relevant literature are geological factors, hydro-energy factors, infra-structural factors and healthcare factors.

ANP model

One of the most used methods in multi-criteria decision making model is ANP (Analytical network process)(Mo'meni and Sharifi, 2012). Analytical network process is one of the modern multi-criteria decision making techniques which is presented by Professor Saaty (2001) (Ghodsipour, 2010). The main hypothesis in AHP is based on independent performance of top hierarchical groups from the below sections and measures of each level (Chang et al. 2005). Analytical network process is one of multi-criteria decision-making techniques (Faraji Sabkar et al. 2010) in which network structure replaces hierarchical structure (Saeedi and Najafi, 2010). AHP method is applied by researchers in various scientific fields (Khalidji, 2013). Despite wide usage of AHP, this method is not devoid of faults. Some criticisms toward the model include: the ambiguity in concept of relative importance of each element of decision-making hierarchy while comparing with other elements, the number of comparisons for great issues and using a 1 to 9 scale (Fathi, 2010). Many of decision-making issues cannot be placed in a hierarchical structure due to the interactions among various factors, since some high-level factors are especially dependent on low-level factors. Saaty has suggested applying AHP for solving issues with dependent measures and alternatives (Saaty, 1977).

Various elements are dependent on one another in this method. Saaty proposes to use ANP (Aragones, 2010; Wey and Wu, 2007). ANP considers each subject as a network of measures, sub-standards and options which are associated with each other in clusters. All elements of a network can interact with each other in any form. In other words, feedback and mutual relationship among clusters is possible in a network. Thus, ANP method was presented as a generalization of AHP. AHP provides a context for hierarchical structures with one-sided relationships (Lee and Kim, 2000; Saaty, 1980; Momoh, 1998). So the term "cluster" in ANP replaces the term "level" in AHP (Buyukazici and Sucu, 2003). So ANP is composed of two parts: control hierarchy and network relationship. Control hierarchy includes the relationship among purpose, measures and sub-standards and affects internal connection of the system, while network relationship consists of dependence between elements and branches (Saaty, 1999). Figure 2 displays the difference between a network structure and a hierarchical structure.

As it is seen, a purpose (or a node) is placed in hierarchical structure which ends in a node or destination branch. Therefore, we have a linear structure from top to bottom without returning from lower to higher levels. But in network structure, network and its branches are not distributed in a regular manner. Moreover, a branch can be affected by itself (internal dependence) or affect other branch (external dependence). There is also a possibility of direct return from second branch or passing through the middle branch. In a network structure, a system may be composed of a hierarchy with gradual increase of its relationships, so that a pair of relating components connects to each other arbitrarily and some of its components have internal loops dependence. Considering the aforementioned explanations, we can assert that out of the four mentioned conditions in analytic hierarchical process (reversibility, homogeneity, dependency and expectations), the third condition of hierarchical dependence is violated in network analysis process. This makes ANP a more robust technique in constructing complicated environments in comparison with AHP, since this method can focus on a variety of interactions and relationships (Khan and Fasial, 2008). Meanwhile, ANP generates a structure which potentially reduces the judgment- induced errors by giving higher level of "assurance of information process" (Nirma and Saaty, 2004). Though this process does not require hierarchical structure, but it utilizes relative scale with human judgments, just the same as AHP. Thus, individuals' entire influences and judgments are obtained using relative scale and by this means, a careful prediction is carried out about them (Tozkia et al. 2008).

Research territory

Boroujerd, the center of Boroujerd city, is the second populous city of Lorestan province. This city is located in the north of a fertile field named "Seylakhor" and high mountains of Garrin have surrounded it from northwest to southeast. Several and permanent mirages which are flown from the mountain slopes have played a pivotal role in the economy of this region and development of Boroujerd. Since long ago, this city has possessed a special connection status. Its location on Tehran- south highway is often quoted as one of the factors of its economic boom. According to 2011 census, the population of Boroujerd has been reported to be 240,654 people. The region of Boroujerd is one of the most significant centers of Lori-speaking people and the common accent of its people is Boroujerdi accent. Due to the activity of various animation companies of this city, Boroujerd has been named as "Iran's animation capital" since 2010. Due to the presence of many production and industrial units and the supply of their products in domestic and foreign markets, Boroujerd is known as industrial hub of Lorestan province.

RESEARCH FINDINGS

Subject model and structure: following the determination of standards and indicators for location assessment to establish temporary residence, the importance coefficients of each component should be fixed. To do so, the structure of proposed model is needed to be drawn. In second step, we should decompose the problem to network structure which is consisted of goal, measures, sub-standards and strategies and eventually develops network structure of the research (figure 3). Then, using Super Decision software, the problem was clarified and decomposed separately in

each form of present set of factors in sub-standards. Its results are seen in the following diagrams. Relative weight of each sub-standard was determined by applying eigenvalue method (final value) (table 1).

Combining the maps and creating the final map

In this step, ARCGIS software and Spatial Analyst are applied to create weighted RASTER maps considering the extracted weights in previous step. The maps are combined together afterwards to achieve the final map with final weight. Sine ANP is used in this step, the final map software in RASTER calculator is obtained based on calculating operators from collection of the maps (McCoy, 2001). For combining the layers of a level, the value of each cell in the respective cell is multiplied by the weight of that layer and all layers of a level are added together. The effective factors in locating relief centers regarding the collected data was entered in ARCGIS environment as a data field and was analyzed and evaluated considering their importance and value. In the end, the optimum locations for relief centers were set out by applying achieved weights from Super Decision software in the respective layer. Due to the multiplicity of standards and studied maps and limitations in presenting all of them in the article, we have confined ourselves to mentioning a few sample maps.

SUMMARIZING AND CONCLUSION

The aim of this research is to locate areas for establishing relief centers and temporary residence at the time of natural disasters. Boroujerd city is considered one of the most important cities of Iran due to its historical aspect and population, economic, communicative, and cultural potentials. The location of this city in a region with high seismic risks and the occurrence of several destructive earthquakes throughout city's history make the planning on crisis management in this city quite a necessity. One of the steps of this planning is proper location of temporary residence for the injured ones in the earthquake. Based on this, and regarding the analyses and calculations, the distinguished spots are observed in figure 11 in the order of proper and improper areas. The research results indicate that topography lines, slope and distance from the river have the most pivotal role in providing relief from relief centers. Also, applying overlapping methods using GIS and multi-criteria valuation of network analysis demonstrates that connection lines, lithology, the distance from the river, topography lines, slope and direction of slope is the effective factors in locating relief centers which are consistent with stable development indicators. The mentioned criteria are organized in a hierarchical structure. Prioritizing the standards and sub-standards was carried out by ANP method. The model results indicate that slope and distance from the river have the highest effect in locating relief centers with coefficients of 1 and 0.77 respectively.

In figure 12, the parts of studied region which is distinguished with green are in perfect condition for relief centers location. The parts in red have proper and the blue areas have improper conditions for establishing relief centers. The proper locations in the center and suburbs of Boroujerd have occupied higher areas in comparison with other area.

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Figure1. Effective measures and sub-standards in locating relief centers

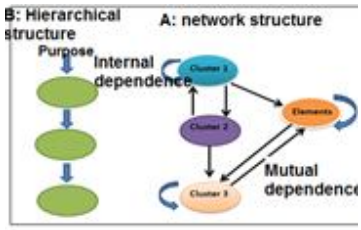

Figure2. Structural difference between a) ANP and b) AHP

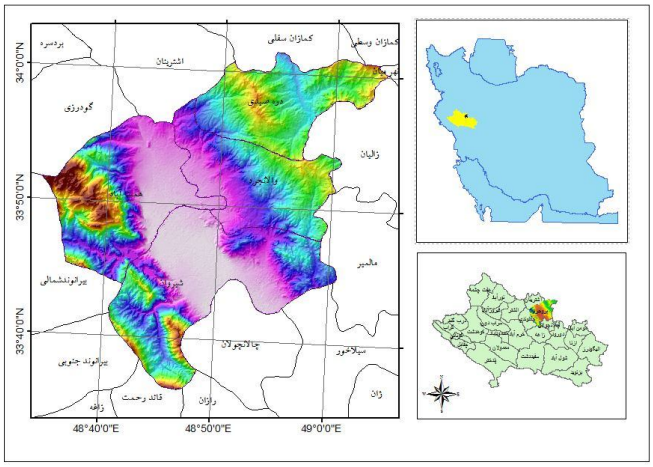

Figure3. The state of Boroujerd in Iran and in the region

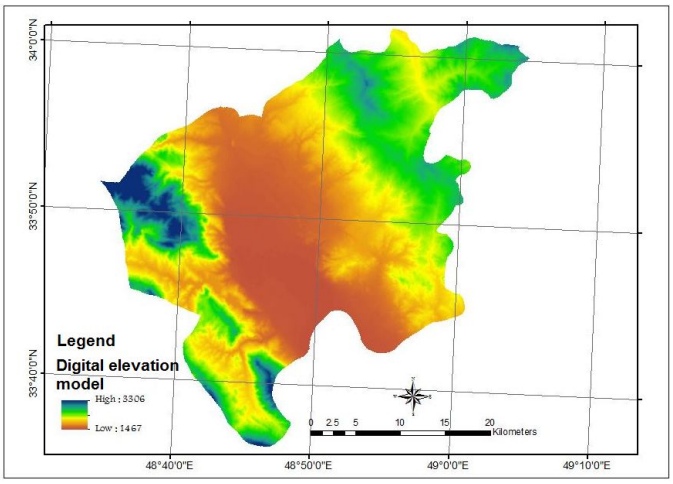

Figure4. Weighting topography lines

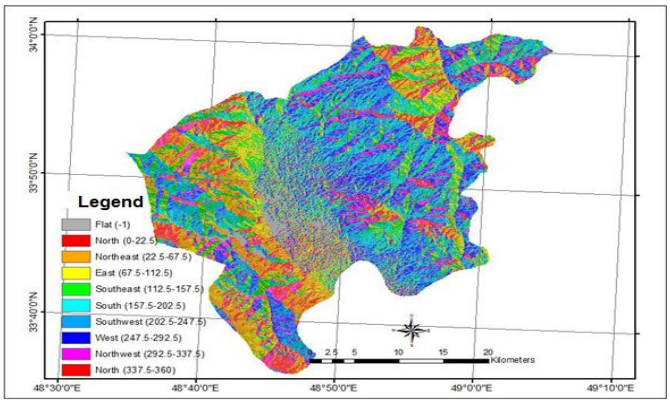

Figure5. Weighting slope direction

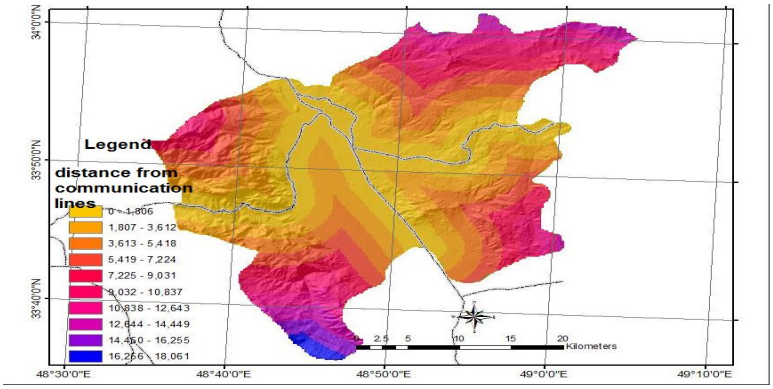

Figure6. Weighting connection lines

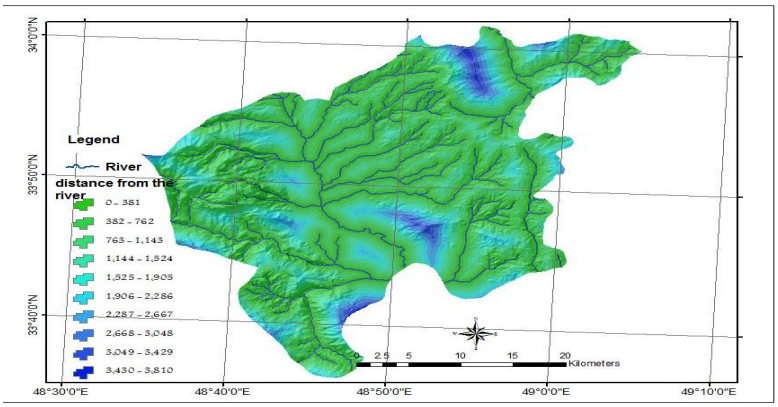

Figure7. Weighting the distance from the river

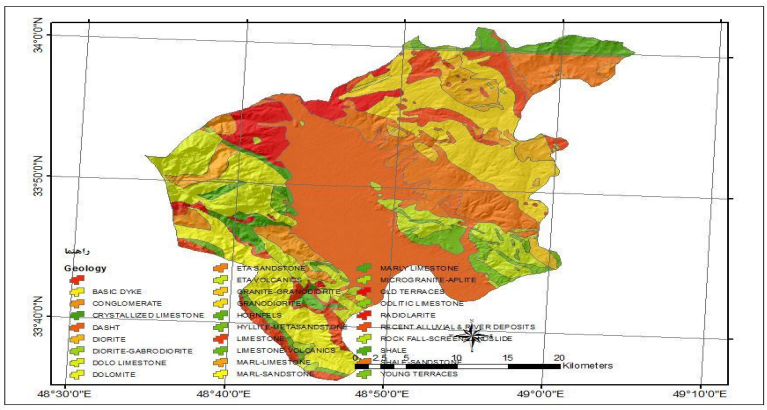

Figure8. Lithology weighting

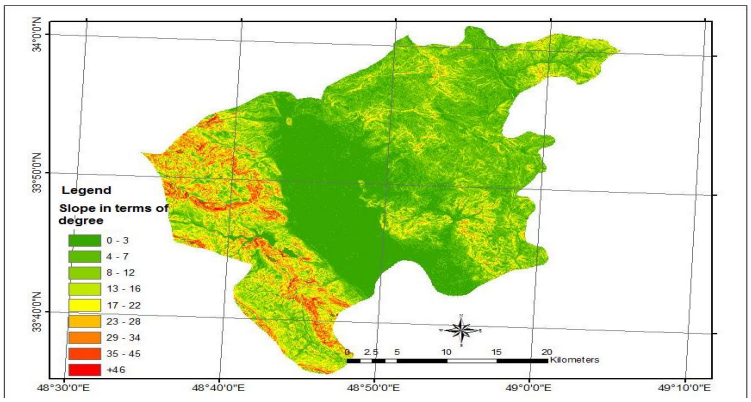

Figure9. Slope weighting

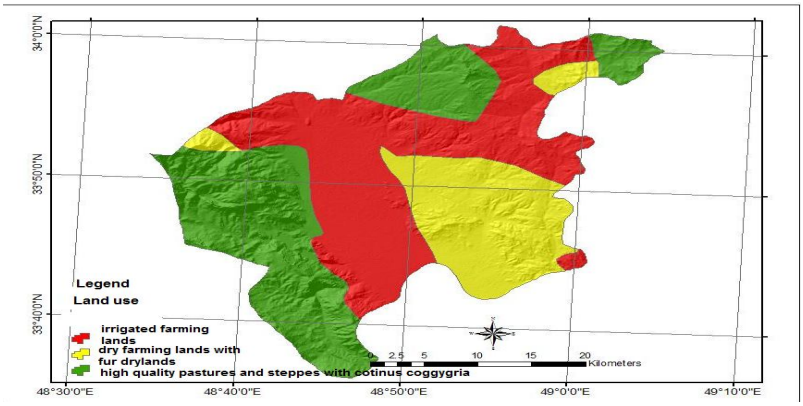

Figure10. Region lands use

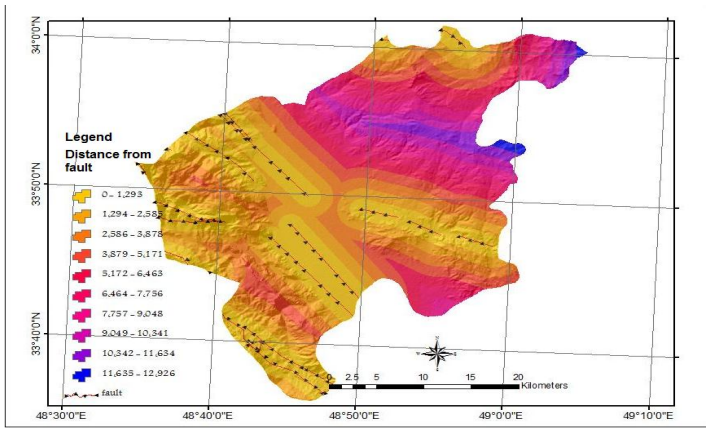

Figure11. Distance from fault

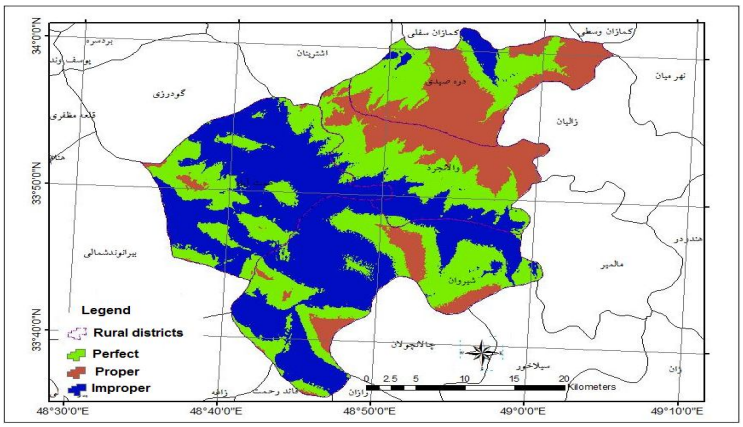

Figure12. Optimum locating of lands for establishing relief centers in Boroujerd

Table1. Paired and network comparison of effective factors in locating relief centers by Super Decision software

	1.Purpose	2. Criteria	3. Option				
	Topography	Slope direction	Communication lines	River	Slope	Use	Lithology
Topography	0	0	0	0	0	0	0
Slope direction	0.095434	0.068728	0.098987	0.054475	0.079072	0	0
Communication lines	0.467304	0.043243	0	0.179872	0.087393	0	0
River	0.277178	0.078578	0.054475	0	0.079959	0	0
Slope	0.160083	0.142278	0.179871	0.098987	0.08691	0	0
Distance from fault	0	0	0.13333	0	0	0	0.75
Use	0	0	0	0	0.22222	0	0
Lithology	0	0	0.53333	0	0	0	0

Table2. Final calculation of weights of sub-standards

Sub-standards	Ideals	Normal	Raw
Topography	0.573217	0.128893	0.128893
Slope direction	0.136925	0.030879	0.030879
Communication lines	0.595826	0.133977	0.133977
River	1	0.22486	0.224859
Slope	0.779649	0.175311	0.175311
Distance from fault	0.660729	0.148571	0.148571
Use	0.66373	0.149246	0.149246
Lithology	0.037146	0.008353	0.008353

Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Investigating the Transition Movement of the Municipal Management in the Cities of Iran and the Impediments of their Headway

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Received: 23 Mar 2015 Revised: 26 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

In these days with increasing the cities and city dwelling, the city management subject has become one of the essential and sensitive topics of the societies which should be considered from different aspects of legal, political, social and economic. In this research in addition to defining the city management and its place and importance, the previous records of city management in the beginning of Islam and Mashroteh period has been considered. Then the legal and social aspect of city management and the way of its operating about thishas been mentioned, and in the meantime of propounding the legal weaknesses, some suggestion will be given. Consequently, in addition to the confirming of the developing laws of city management, and the way of operating it from Mashroteh period up to now, unfortunately the city management condition and the rules and regulations about it are not in a desired situation, and in comparison with the developed countries there is a considerable space between them. For exiting of such difficulty, it is necessary to do some legal reformation by the Majlis, and also it needs the way of correct operation by the government.

Key words: city, city management, rights, laws, regulations of city management

INTRODUCTION

The process of developing of city dwelling in Iran, and the companionship of the cultures and different groups with each other, and turning the rural relations to the city ones make it necessary to define the operant reactions together and with the urban characters in the urban society proportionate to the daily legal criteria and the strong protection by the sanctions. While the role of this set of laws is in the acquisition of the permanent extension, turning the city dweller to citizen, the eminence of the civil society,immunizing the cities of dangers, increasing the quality of the city environment from one side ,and the restrictions of the present laws for answering the city needs from the other side, the existence of the collision norm of the sources ,taking the lead of the city dwelling over city making, the reliance of scientific and scholarly gathering of noticing to this novice major, the unfamiliarity of the majority of the city managers, the legal society, and the citizens of the country with these city laws and ….indicates the importance of redefining these rights andthe set of laws.

The society special form has near relationship with its total expansion mechanism. For knowing the countries, first we should understand the processes which by them the special forms are created and transformed, the cities should be imagined not only as an specific place, the city region, but also like an unseperatable part of the consumption processes which these processes have the natural side of industrial capitalism.

Proportionally of the differences of these systems, the situation and the process of the management of the city environment has gotten different forms. Such forming and giving role to different actors especially the government, legislation constitutions, local governments , people, institutions ,and the civil parts of the society and the citizens causes this point that one of the problems and matters in the city studies field (city planning and managing)which mooted universally, is about the city rights, city life and city management. If we know the city management system as one social system which has order of hierarchy and work division, this system including the policy making process, planning, conformity, organizing, and supervising the city management and municipality, and the information sources, financial and human and the citizen's and government's exceptionsas entrances and services needed by the residents of the city and fundamental changes of the city places as the exit of this system. The importance of the city rights should be searched in compiling the laws about citymaking, planning, city management, and the positive influences of lawmaking in the city life and other change making consequences in planning and city management.

According to Hirascar the city managers and planners usually face different problems which facing these local and city problems correctly needs planning the city laws, and the municipality laws, city planning law, city well-making law, dividing the zone of the lands are of the most important laws.

Bayesteh believes that the city decision making process when causes the city management profit that citizens participate in decision makings more. So law making of this process helps a lot to the city management, citizens and cooperation in decision making.

In investigating the laws of the city in city making, city management and the way of managing the work is in front.so one can say in massive and national level both in preparing, collecting and approval of the laws and in cession and vesting the work in small and local levels what stages has passed, and whether the laws and obligations which taken into consideration has improved and progressed or has drawn back?

The Importance of the Research: City is an important source for development, and the role of the city management in city development level and city dwelling enhancement has a very important role. From the other viewpoint, one can assign the city management in a well-organized and stable enhancement. This case in which the way of management has an important role in human city dwelling and the stability of city enhancement. Because the city

permission and planning agent caused by the city management. The daily extension and complexity of the cities has made the city management to a difficult task. Except matters likeenvironment, transportation, safety and city planning, city management is one of the important factors which has an augmenter and assigner effect on city constructor factors. If city is supposed like an organization ,it is necessary to put an element on the head for future planning and present handling of tasks. This element may be called city management. The fast growth of the cities in developing countries has made social, economic, physical problems, problems like extensive poverty in the city, unsuitable dwelling and main city services, unfamiliarity of the citizens of each other, making illegal dwelling, insufficient transportation system and lack of city facilities,etc. . There are two solutions to face this problem.

Decreasing the city population in cities by preventing migration to the cities and alleviating the birth of the children.

The improvement of the city management

The solutions of the city management mostly are depending on city management. The city management is a comprehensive concept and its aim is to fortify the governmental and non-governmental organizations for knowing the programs and different politics and running them with the best results. So an effective reaction in facing the problems and matters of the cities for activating them is a big challenge that city management face with.

In other words, our cities have laws, provisions and regulations according to the city making which the ratification of most of them come back to many decades ago, that neither city dwelling was in such extension nor their municipality didn't need assigning new laws and provisions which with them the office affairs of the cities progress in a correct and profitable way. Having program, organizational setting, using pro forces and providing the necessary budget need city management till control thesedays cities. In such cases, the country has seen that the city management in our country has difficulties in some structural and organizational, professional and budget matters, and by this difficulty not only our cities problems have not solved by laws but also their existing powers has wasted and the problems has remained unsolvable.

The Third Subject: The Research Questions

Has the process of city management laws and provisions been for the cities improvement and extension ?

Are the city laws and provisions of city management beneficial ?

According to the laws and provisions of city management what process Iran has had?

The Forth Subject: The research Background

Loftyandthe,etal (2010) in an article with the title of " City Management and its Place in Improving the Citizens' Rights" investigated the set of city laws and the extension and devolvement plans approved in the high council of city making and architecture of Iran from the time of its establishment. This investigation has shown 6661that unfortunately such system in the set of public laws and provisionshas seen less.in fact the city rights is a combination of the citizens' duties and responsibilities toward each other , the city, government or the governors, the country and also the rights which the city managers(municipality) government or governors are responsible for. These set of laws are called "the citizen rights".

Lalepoor and the ,etal (2012) in a research with the title of "The Structure of Iran City Management with the Emphasis on the Cities' Main Transformation" in which the foundlings have shown that centralization in the country management structure caused restrictions in city management powers in city matters.

Azizi and the ,etal (2012) in a research with the title of "Investigating the Role of the Action Agentsand City Management Instruments in Integration of Managing the Metropolice Tehran" has shown that managing the metropolice Tehran in different fields of action is done by different organizations which causes the equivalency about it, and has caused the present city management problems of this city.

HosseinZadehDalir and the ,etal (2012)in an article with the title of " City Management in the Cities of Iran" has investigated the role of cities in the region extension and the stable extension of the city, the importance and necessity of the city management topic and its related problems are analyzed.

Sarafi, Mozafar (2008) in an article with the title of "Analyzing the Citizen' Meaning and Evaluating its palace in the Laws, provisions, and the Country city Management) has studied the establishment of the necessarysituations and paving the way for equalizing the city management including citizens, the controller organizations of the city, Islamic city council and the private part which it needs to be on the obeying the laws pivot.

Shieh, Esmaiel (2004) in an article with the title "The necessity of the City management transformation in Iran" in which he talks about the necessity of transition in Iran city management. At first about the problems of the cities of Iran and their hardships ,and then with investigating the theoretical essentials in city making fields, the aims of city management in today s world has been investigated.

DehghanNayery and the ,etal (2012) in a research with the title of "Analyzing and Describing the city management system in Isfahan in Mashroteh Period". This article with referring to the sources of Mashroteh period has investigated the way of forming and starting the work of Badlieh office in Isfahan ,social situations, challenges and the eminence obstacles and the people 's opinion toward this new city management system and the actions of this newly made organization for establishing its position and credit among other power centers has been probed.

Abadian and the ,etal (2013) in an article with the title of " the Historical Obstacles in City management in the First Period of Mashroteh, the Experience of BaldiAssociassion" not only the Mashruteh movement in Iran was a reference point from the political and mental view, but also from the social view has along a new section in the life situations of city dwellers . The most important manifestation of this subject is making the Badlieh association and offices which was an introduction in making new municipality.

Parhizkar and the ,etal (2013) in an article with the title of "the Perspective of City Management in Iran with the Emphasis on the Extension of City Stability". This article is about analyzing the city management in Iran with using the laws and the future perspective based upon the government approach, and then according to a set of discussions and topics about the city stability, the future horizon with the stable extension analyzed and evaluated.

The Fifth Subject: Definitions

City: City in geographical approach is the result of the relations that human has with the nature so that the city can be a human being environment. For gratifying his needs in the symbolic economical transformations, human being transformed the space, too. Such transformation has been done in the meanwhile of a destroying-making process.it means that for making new places, destroying the previous ones are needed.

In the city sociology approach city is defined in the lieu of a society actuality. From the social point of view, cities are suitable places for making the collective organizations, exaltation of cultural values, the extension and fortifying the relations and the social occasions and guarding the human ways and local and national identifications.

The City Management

The city management is called all the organizations, places and human beings which influence the city management formally or informally. The city management means doing the plans and programs which in city planning are needed, and the way of execution and inspecting them according to the city dynamism and transformation. Management is the process of the effective using in corporeal and human sources in planning, organizing and mobilization of the sources and facilities and control and managing them. Managing the metropolis with the necessity of cooperation of different parts in different forms of the local meeting partnership, the government and political parts.

Theoretical Essentials in City Fields and City Management

Management is a way for reaching the aims which is supposed for an organization and the duties which the manager is responsible for. Management means planning, organizing, observing and creating provocations. City management should do some planning for the city, organize city actions and observe the city actions and even for the profitable doing of affairs creates motivation. Doing such cases needs management, planning, connections, provocation, organizing, guidance and leadership, observation and controlling.

The main aim of city management is improving the work situations and the life of city dwellers in people and different social and economic groups, and protection of the citizens' rights, encouraging the stable economic and social extension and protecting the main environment. So when the city had problems and insufficiency in doing the affairs, and had city health problems and the pollution on the environment, and suffers from different social harms, and some crises like dwelling, lack of public establishments, unemployment, low earnings, hut dwelling, social hardships, the improvement in city cars, no identification in city making and buildings, one can conclude that the city management is in difficulty and restriction. For such cases, the city management should have planning for the city current situation and overcoming them, design the future plans and according to them plan an ideal future based on the situations and time and place conditions. About this the city management should be the preserver of the cities and the people's profits.

According to Vaugan the city managing workers including city managers, builders and the private part should improve the city dweller's life by increasing the art and preparing the education. The cities should manage in a way so that it remains no stress or fear for the city and its people. According to LuiseMumford todays city extended are so different from the past. In todayscities, the aimless production, the limitless extension has made the city like a factory, railroad or hut.

According to Gopy, the Indian sage, the city is a cultural right, because the culture is the most obvious and clear factor in human phenomenon.

According to Maylz Friedman, the city place and city management should become clear in collecting the programs of the extension management and regional and country programs. It should become clear that different programs are done in the city, how they affect ,and how a program is planned so that the city and regional extensions improve continuously.

One of the problems of the cities is the existence of unsuitable neighborhoods and huts which are without any social comfort or facilities.so first it is necessary to programfor the cities in addition to planning.

Under the banner of collecting the programs for social comfort, planning for the cities means paying attention to the social and main structure, keeping the discipline and the form, extending the city, protecting the social values, collecting the program for the basic environment. About this, the city manager's duty is to make facilities and social comfort, consider the criteria of effective field, prevent the mold shaping of the cities, and create the legal structure for them. The suitable chances should get to the highest point in making the social facilities for all the people of the city society and increase the city environment for the human and cultural values and fields.

Perasad Misra believes that the big cities in developing countries has been made to the gathering centers of economic employers. At the space between these two cities, there are some small cities and towns which the quality of life in them is not better than the villages.

What is the duty of city management about this and how it should collect the programs by which, he in addition to the settling of the population in regional areas, he overcomes the smoothing of the city life.so city management is not only in the form of observing the transportation, constructing, watering and increasing the green grass, leveling and asphalt paving, gathering the rubbishes and keeping the health of the city and so on, but also its domain is much wider than what has been seen these days in the world. According to Frank LuidWright, the big cities of the world after paying their portion to the human being, has been made to a force of gravity which is unobservable which by the profit logic gets the life and has been under the force which are changing daily and continuously. Think about the cities you know, and see the magical instruments that we have, what they have done for decreasing the space between the cities. From this point in managing the cities, we should consider the matters that destroy this space, and consider the problems of the cities from the inside. The most important duty of the city organizations is to apply the politics which set free the city people from the problems like disappointment and indifference.

City management itself get the meaning in the laws of the city making knowledge, and the aim of city making is to create some places which cause the maintenance of human being and his great values.

In the above cases Luis Mumford's idea is important and considerable. He knows the city as a symbol of social phenomenon. He believes that the cities which have the remaining old customs in them, how cannot cut their dependency on past by the dauntless transformation of the earth. The cities are the expressive of the human life which contact with the human personality. The definition of the city in the amount of the population, dispersion or dependency to the environment is not sufficient. The human part of the cities is the essence of this definition. The streets of the city are one of the stages of showing such life which our out of the scene.

The intention of Luis Mumford is mostly that the cities has grown in different directions, and has cut their relations with the past. The city life problems put no chance for showing the human values, and the cities are places for eating and sleeping without any social homogeneity.

All kinds of facilities are prepared in cities; highways and streets connect the different parts of the cities in the shortest time, and this is quell with getting away of the people in which the mental and spiritual spaces is decreasing daily. Every development program and every action done to increase the city or city facility should be considered deeply so that the place of human and his values get worthful, i.e. city management should distinguish what is necessary for the health of the life and what is detrimental.

City management should fine the solutions for these matters at first and with obeying the laws. For this point knowing the social problems and cultural values, designing the equalizing program of the city, athe hierarchy of

efficient fields, moderation in dwelling and city needs, keeping the identities and valuing them, education, solving the problems and social complications, eliminating the unemployment, decreasing the crime, and keeping the citizens' rights, visual beautification and keeping the city phase, preparing the public and basic necessities and observing the fields and structures are the duties of city management.

Equalizing in city civilization and the absence of anxiety and worries of city organizations and its people are in this field. How the developed countries have overcomed the city problems?

City Management in Iran

The laws of city management in Iran, in their todays meanings, have passed a hundred year way.In the year 1286 of solar calendar, and a year after the establishing the rulingMajlis, three municipality laws, state associations and establishing the states and provinces have been approved in the Majlis. The municipally assemblies before doing anything, after four years disorganized by the suggestion of the ruling government. In solar year the municipally law and changing its name to municipality was approved. In the year 1311 of solar calendar (1933 A.D) widening the streets and destroying the old walls, in 1316 (1938 A.D) the new map of Tehran and the total transition in the city, in 1318 (1940 A.D) approving the regulation of the projection of the buildings in passageways, in 1328 (1950 A.D) ratifying the legal bill of establishing the municipality and city council, in 1331 (1953 A.D) the legal bill of land registration of the Tehran wastelands, in 1339 (1961 A.D) the law of taking possession of the lands for operating the city making plans and home making, in 1342 (1964 A.D) correction of the extension law and widening the streets and the fields, in 1343 (1965 A.D) the possession law of the apartments, in 1345 (1967 A.D) the comprehensive project of Tehran, in 1352 (1974 A.D) the law of observing the extension of Tehran were ratified by the ruling Majlis.

In 1316 (1938 A.D), the office and the divisions of the country based on making the states and provinces were changed andsubstituted by city divisions of the country. According to this law, the levels of province, city, town, district by the governor general, governor and governor of a rural district were ratified. According to this law the municipalities were like government departments, and worked under the control of governor general. Until 1312 (1934 A.D)because of the financial problems and the unfamiliarity of the people in charge of the municipality, there weren't enough attention to the quality of the cities. The law of making and extending the streets was the first legal toll in city making.

From 1323 to 1357 (1945-1979 A.D), in addition to the gradual rectification of the municipality laws and city council, new agents and public organizations were entered in Iran according to the decisions of the rulinggovernment, which the Plan and Budget Organization,ministry of Housing and City Making, the Municipality Union, and Technical Offices of the Office of the Governor General are of the most important ones.

City Management after the Islamic Republic of Iran

After the Islamic Republic some laws ratified about work and municipality management. Although there were city council before the Islamic republic in an alternative way beside the municipalities, the work of these councils in practice started based on the laws and with the name of Islamic council from the third decade after the Islamic Republic.

In some developed countries, the necessary conformity among different parts with a single management or a homogeneous and integrated management, and with the control of the people's representatives in the city, district or state. In such countries usually, with clarifying the laws, the laws and regulations and with separating the duties of different systems, the city management under the vision of the people's representatives in the councils, consultative assemblies or local parliaments has reached fairly to an acceptable conformity in the city management.

In some other countries a homogeneous management has not become certain, yet. It is natural that in such cases we can see nonconformity, delaying in doing the projects, and the absence of homogenous development. In such countries, the law of the people's representative observations usually in local and district councils and regions is not clear. The role of the government representatives has not made clear. In fact, it is not clear which duty is for which part. The role of conformity and running has not been clarified well. It is evident that if each section operates without the conformity with the other section or any system without the conformity with the other one, we can see the differences in the big body of the city and the discontentment of the citizens.

In most of the countries, about city management, the city councils are on the head of the affairs, and after assigning the mayor, theyare responsible for observing the way of controlling the city and the operation of the mayor and the municipality.so that all the organizations related to the city development and the like which are responsible for the people comfort do their job under the control of the city council.

As we know, about operating the city plans which delivered to the city managers, the only place or administrator is the municipalities.

The Constitutional Law, the Majlis Laws, and the role of the Councils in City Management

The constitutional law has paid a serious attention to the city councils and their decision making and observing roles in the different affairs of the cities and regions. Principle 7 of the Constitutional Law has known the councils, in the direction of the Islamic Consultative Assembly (the Majlis) ,as the decision maker of the affairs of the country.

Principle 100 of the Constitutional Law has made possible managing the villages, districts, cities and provinces under the provision of that place council.

Principle 101 of the Constitutional Law has propounded the way of making the high councils of the provinces for preventing discriminations, and attracting the cooperation in preparing the development and welfare of the provinces.

Principle 102 of the Constitutional Lawhas given this right to the high council of the provinces to prepare some plans in their duties restrictions, and deliver to the Majlis directly or by the government. This principle has forced the Majlis to investigate these projects.

Principle 103 of the Constitutional Law has forced the governor generals, governors, the district governors to obey their decisions.

Principle 105 of the Constitutional Law has emphasized the absence of disagreement of the councils with the Islamic restriction and the country laws. In this principle the right of protest to the dissolution and complaint to the court for the councils has kept, and the court is responsible to investigate this matter out of turn. As we have seen the Constitutional Law has paid a serious attention to the importance of the councils in the country ,and know them as a decision making organization, and has given total and outstanding authorities. But here it is necessary to investigate that whether the Islamic consultative Assembly (the Majlis) has paid attention to the council in collecting and approving the laws or not, and whether the laws of the Majlis has prepared the necessary backing for the position of the councils in the achievement of the management.

If the laws of Majlis about the councils between the years of 61 till 76 (1983-1988 A.D) being considered, the first laws have been approved in the early of Azar (December) in the year 61(1983), and notified to the Majlis, and before

operating in the year 77 (1988) they have changed six times. So it seems that the government has had no favor to operate this rule and its role in city management.

It seems that the laws of the year of 61 (1983) and its new correction in the year 65 (1987) in comparison with the law in the year 75 (1988), according to the constitutional law about the councils were more near ,and to the observation role in the affairs of the towns, cities and provinces.

As an example, according to the section.5 of the article 19, the law of making the Islamic council of the country in 61/9/1(1938 A.D), controlling the homogeneity and complete performance approved in social, political, developmental, health, cultural, educational and other facilities in the city are the duties of the councils. But with approving the law in 75(1988) under the title of the law of making the duties and selection of the councils and the mayors, such duty and lots of other ones about the city management are deprived officially. In the article71, the article that mentions the duties of the councils, all the duties of the councils about other city systems, except the municipality, has been deprived in practice, and it seems that at the time of approving this law, the Majlis has not paid any attention to the city management and the role of the councils about it. So one can say that the law of the year 75(1988) of the Majlis is not in the conformity with the constitutional law about the councils.

With the approval of annexation law of a note in the article53, the law of the country in the Islamic councils of the country in 64/28/6 (1986) ,in practice the city councils duties in municipality affairs have been issued on ministry of Interior. This note has said that until the creation of the city council in each city, the country minister or the supervisor of the Ministry of Interior is the substitution of the Islamic council of that city. With the approval of this note the Majlis practically puts the responsibilities of the city council on the Ministry of Interior. It seems that the approval of this note is not without any problem. As another example,the Majlis in the year 75 (1987) has not brought anything about the cities,townsand the provinces,which needs thinking.

As we have seen, the Majlis after the republic has paid a different attention to the councils and their rules in operating a homogeneous management. It seems that the first and second Majlis has paid a serious attention to the councils in the cities and the necessity of their existence toward the ones selected by the people. But the fifth Majlishas paid attention to the city council completely different.

The Role of the Executive Regulations and the Government Sanction Laws

Although the main role of the executive regulations, which is approved by the council of ministers, is operating the sanction laws which were ratified in the Majlis. But later we have seen that between the sanction laws with what the constitutional law specified and with what ratified by the council of ministers about the laws in city management, has a direct influence in city management.

As an example, if the executive regulation in the year 75(1988) which ratified in 78/1/11 (2000) in the council of ministers, it has seen that according to the article94 of this law, the ministry of Interior is obligated to prepare this law in two month after the approval of the councils in Khordad in 75(1988, June) and delivered to the council of ministers. The council of ministers was supposed to ratify it after three months and out of turn. So for doing this subject until after three month later it remains silent, and in practice the executive law of 75 (1988) was notified in Farvardin 78(2001, April). It seems that the reason of ratifying this regulation is holding the councils election in Esfand 77(2000, March). So it is clear that most of its articles have not operated because of the lack of time and the necessary attention andexpertness. As an example in the principle 103 of the constitutional laws has been brought that the governor general, governor and governor of a rural district and other country authorities which determined by the government, in the jurisdiction of the councils are supposed to obey the decisions. But in practice and

according to the articles in the regulation executive of the council laws, the governor general and other managers of the province can prepare the executive restrictions of the councils regulations.

From the other side, it seems that, most of the government regulations has been approved in related with the city management, with centralization point of view and with the aim of increasing their jurisdiction and weakening the role of the local representatives and finally in the government. As an example, in the comprehensive bill of the city council responsibilities in the country at 81/2/2 (2003) from the government for investigating the Majlis has been sent to the real position of the councils and management has not paid attention. So it seems that the principle7,103 of the constitutional law, at the time of regulating and compiling this bill, has not considered.

CONCLUSION

The efficiency of the city has taken place in the framework of social and political matters. On this line, city management should be the preserver of the city profits, moreover it should prepare some programs and fulfill them that its result is for improving the public cultural level, keeping the positive social and cultural values, moderation in the healthy life of the people, public welfare, the health of the society, planning and cooperation in dwelling problems, unemployment, crime, addiction, recreation, education, commuting and the like. In addition to the organizations under control, which decide about the education, comfort, curing, earnings and the culture, the city management should prepare the fulfillment of the related aims.

City management should prepare the extension of education in all fields and for all the people in different ages. Increasing and the extension of cultural places is another duty which the city management is responsible for them. The health of people, increasing the hygiene, observing the mental health of the dwellers in the city are of the city management duties. The people of the cities in different molds and groups should not be anxious about the life, communication.

City management should prosper for the people a certain future along with the social kindness and sincerity. although preparing most of the public, individual, social and private needs of the people is the responsibility of other organizations, but the city management should try a lot and with planning the program and cooperation prepare the social, political, security, welfare, education, health and finally cultural services.

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Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Fight against Financial-Administration Corruption in the Administrative System of Country

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Received: 21 Mar 2015 Revised: 20 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

Unfortunately based on the existing domestic and international evidence and statistics, Iran is one of the most corruptible countries of the world. According to scientific surveys of research unit of Journal of Iran Economics conducted in the year 2003, it was found that about two-thirds of the respondents have been grappling with the problem of bribery and have paid a bribe.As the Leader of the revolution in paragraph 8 of his command prescribed that,, in the fight against corruption we should not go after the weak and small errors Instead of addressing the root causes and the seditious (Khamenei, 2014). So in this respect in the fight against corruption more attention to the roots is needed and also in combating the roots, prevention of Corruption is the most important tool to fight corruption.The present study has been performed to identify ways to fight against financial and administrative corruption in government administration and with a description, documentation and library method.

Key words: corruption, financial and administrative, administrative system of country

INTRODUCTION

Corruption is one of the important economic problems in societies which date back more than two thousand years old (Danaii Fard, 2008).The devastating effects of this economic phenomenon widely appeared in allocating resources, economic development, income distribution and other cases has led to gradually increase in concerns about it.Unfortunately based on the existing domestic and international evidence and statistics, Iran is one of the most corruptible countries of the world. According to scientific surveys of research unit of Journal of Iran Economics conducted in the year 2003, it was found that about two-thirds of the respondents have been grappling with the problem of bribery and have paid a bribe.

In the most recent statistics released by Transparency International Organization in the year 2008 on the prevalence of corruption in countries, rank of corruption in Iran has been evaluated 14 (Out of 180 countries) that in comparison with the last 5 years has dropped 54 places.

This is while, perhaps less countries in the world have emphasized, as much as Iran, on the fight against corruption and drawn attention of politicians and decision-makers to it. In fact, the statistics and evidence show that despite great efforts and also the enormous financial and the human resources invested in the fight against corruption, few and negligible results have been achieved. Therefore, the scarce national resources spent in this way have been largely wasted. In all countries of the world, especially the Third World corruption is mentioned as a complex phenomenon and a fundamental challenge (Rabie, 2006). Since corruption, brings the legitimacy and effectiveness of government offices into question and damages all dimensions of the reconstruction process and the establishment of political economy including disarmament programs, reconstruction projects, economic growth and other development programs. More academic research is needed to investigate this issue. So far, researches done on the effects of corruption in third world countries indicate severe tension between reconstruction long term goals including creating active, transparent and healthy offices on one side and access short term goals for peace on the other side (Rafie Pour, 2007).

The necessity and the importance of research

Despite all the efforts made to improve the administrative system of country, it still lacks efficiency and required responsiveness. One of its main reasons is the neglect of Islamic values and its fundamental role in the development and health of the administration system.

Experiences from different countries indicate that corruption is complex, obscure and varied, and hence struggle with it must be continual, long, structured and combined with rigorous and comprehensive planning. In fact, corruption in administrative levels and other sectors of society is like infection. If the infection spreads to organs and structures of society one by one corrupts and disables its members and may destroy the entire body of the society.

Corruption has now become a global problem and governments are aware that corruption causes many injuries and it has no boundaries, as also its results and consequences are various according to the type of economic and political organization and level of development. In any case, corruption causes decline, makes government policies contrary to the interests of the majority and causes the loss of national resources. It also leads to a decrease in the effectiveness of government in conducting affairs and in this way, reduces the people trust in governmental and non-governmental agencies and increases apathy, laziness and incompetence. Corruption undermines the conviction and ethics, increases the cost of doing affairs and leads to the creation of crime in the society; so that the society in dealing with these crimes, will suffer severe social and economic losses and competitiveness and economic growth and human development will be difficult. Corruption also causes the failure of efforts to overcome poverty, loss of social capital, and lack of interest and skepticism in the community, and provides demoralizing background of honest people.

Islam, as the most perfect divine religion, in its essence, is opposed to any form of corruption and insists on purity and righteousness. This emphasis, especially since is concerned with public rights (treasury), has different and clear dimensions and crystallizes in the need to respect the rights of God and people and of what is clear from the study of sayings and narrations is that Islam's emphasis is on respect for the rights of the God and people and also honesty and integrity of government officials.

Almighty Allah says in the Holy Quran: "and those who mischief in the land, are the losers…" meaning that those who corrupt on the ground and among its people; in fact, they are the losers of the world (verse 26, surah Baqarah).

Research questions:

Article I: Basic question:

What are the ways to fight against administrative and financial corruption in the administrative system of country?

Article II: secondary questions:

What are the creating backgrounds of the administrative and financial corruption in the administrative system of country

What are the internal factors affecting trends in administrative and financial corruption in the administrative system of country?

What are the external factors affecting trends in administrative and financial corruption in the administrative system of country?

METHOD OF RESEARCH

The methodology of this study is the library and archives method using books, articles, theses, referring to libraries, research centers and the Internet, and after processing, data and collected information was used and taken into consideration optimally, rationally and discursively for presentations and relevant research results.

Empirical research background

Mehnatfar (2010) in his study entitled "corruption and how to fight it in the process of economic development," writes: Today in many different countries, corruption and fighting it is considered as a major issue. The most important causes of corruption in the public sector are related to government undertakings in economy, and include trade restrictions, industrial subsidies, price controls, multiple rate exchange, low wages in the public service, trade, and stocks of natural resources such as oil.

Shokrollahi (2000): governments should have appropriate legislation and develop required legal system to reduce corruption. It is essential to note that the ultimate goal is not to achieve work health, but the aim is to achieve sustainable development and a better life with better quality for people and legitimacy in society.

"Tanzi and Davudi" (1997), using data from a nationwide conducted a study on the relationship between economic factors and corruption and concluded that these factors are associated with higher corruption: 1. higher public investment, 2. lower government revenues, and 3. Lower quality of public infrastructure.

"Rijeghem" and "Vader" have investigated that to what extent the level of salaries in the public sector is correlated with the level of corruption. Their main argument is that low wages force government officials to complete their income with taking bribes.

Hossein Salehi

Historical analysis of administrative - Financial corruption

Study of ancient civilizations, such as Persia, Greece, Rome, China, Egypt and India, indicates the fact that the corruption in human societies is as old as civilization and also now is one of the issues in the world countries. The corruption has caused many disorders in human societies. Consecutive wars, violence and revolt against the ruling civilizations, falling of organizations and turmoil in communities, have been often the result of corruption (Hamdami Khotbehsora, 2005). The important and warning note extracted from the history of nations and frequently reiterated in analyzing the historical events, is that "the governing board corruption", is of the main causes of the fall of governments and decline of civilizations and the prevalence and spread of administrative- financial corruption. So that, there has been a direct relationship between " fall of dynasties and civilizations " and "administrative-financial corruption" (Management and Planning Organization, 2001). Of before Christ several articles have been written on this subject (Dashti, 2000). For example, about 2,000 years ago in India kingdom, Kautilya, prime minister, wrote a book entitled Arthashastra in which discussed about administrative-financial corruption in the governmental system and mentioned the focus of financial resources within the government as the main reason for the appearance of administrative-financial corruption among government officials. He likened the government into a large jug of honey, which all tend to somehow take advantage of it. Also forty ways of embezzlement is presented in this book (Bardan, 1997: 81).

Consequences of administrative-financial corruption

By understanding the risks and consequences of administrative-financial corruption, the importance of effective factors on this phenomenon becomes clearer (Rafie Pour, 2007). In many developing countries, the public, not governmental organizations and the media, look at administrative-financial corruption as the only main cause of being oppressed and weak economic growth(Yadav, 2005). Frisch (1994) and Pillay (2004) believed that administrative-financial corruption is one of the main obstacles to economic development. Some studies concluded that administrative-financial corruption effects on lowering the level of private investment (Wei, 2000; Mauro, 1995) and meaningfully and significantly decreases the foreign direct investment (Zhao et al., 2003) and this process helps to financial crises (Wei and Wu, 2001) and secondary attribution of resources (Ades and Di Tella 1999), distortion of spending and efficiency of government (Tanzi and Davoodi, 1997), unequal high income and poverty (Gupta et al., 1998), inflation (Al – Marhubi, 2000) and falling of living standards (Faria, 2001) . Also empirical researches show that high corruption reduces social success (Mauro, 1998), reduces the level of human capital and destroys self confidence (Husted, 2002). These consequences and negative effects of corruption, more than ever emphasizes on necessity of doing ongoing researches on administrative-financial corruption which is the source of corruption in the community. In this context, to emphasize more on the sensitivity of the subject, in tabular format, some of the consequences of administrative-financial corruption are mentioned:

1- From the individual points of view, administrative-financial corruption is associated with destructive impacts associated with; including, the incidence of mental disorders, outbreak of family conflict, compromising the credibility and reputation of the person and lack of proper conduct of individual talents (Shalalvand, 1998).

2- From the organizational points of view, administrative-financial corruption reduces the efficiency of the organization and rather than spending time and energy to achieve the objectives, they are dedicated to creating gap in the system. In addition, the process of human development will be damaged and moral virtues will be faded and replaced with negative values in the organization. On the other hand, the administrative costs for consumers, because of the added costs of corruption to administrative expenses, increases and in addition to infecting healthy employees and creating a disappointing and distrusting atmosphere in them, it will question their honesty and integrity and will lower the quality of public services (Luo, 2005).

3- From the social points of view, administrative-financial corruption will prevent from growing healthy competition and will push back the efforts to reduce poverty and inequality, besides it weakens the nations believe in their ability and with infecting of the elite groups to the lower classes of the society, leads to frustration and disillusionment over the foreseeable future. (Sultani, 1999)

4- From the financial points of view, administrative-financial corruption leads to an increase in costs of living, such as rising prices, increasing illegal revenues and irrational Justification of economic backwardness and directs investment to non-productive and non-functional pathways, that all of them will impede or slow the rate of economic growth (Kaufmann, 1997).

5- From the cultural points of view, administrative-financial corruption cause to reduce the trust and loyalty to the organizations, extend the laziness and incompetence and weaken beliefs and moral values of society (Lipset and Lenz, 2000).

5- From the political points of view, administrative-financial corruption reduces the degree of legitimacy and effectiveness of government, endangers the stability and security of societies, and damages to the values of democracy and morality. In other words, solidifies the good governance and democracy and reduces the respect for the constitution and thereby prevents the political development of the society. (Yasser, 2005)

As seen from the examples of some consequences of administrative-financial corruption, the diversity of outcomes and effects of corruption and its formation has made the nature of the administrative-financial corruption complicated. So that, despite government efforts to prevent or combat it, most of reforming and fighting programs of governments have failed (Rafie Pour, 1386).

Therefore, it is necessary to consider this issue with awareness and sufficient knowledge of the extent and the factors affecting the corruption in organizations and conduct ongoing studies in this regard.

Regulations to prevent and combat corruption in the executive agencies

Chapter One: instances of bribery

Article 1- The executive staff and officials that in accordance with the following provisions, attempt to obtain property or documents of payment or submission of property or provide the cause of agreement and negotiate or receipt of property or documents of payment, according to the clause (17) of Article 8 of administrative violations Investigation law - approved in 1994- their files will be referred to appropriate administrative violations Investigation committees for punishment.

A: getting the funds other than what is specified in laws and regulations.

B: getting a grant property or egregiously cheaper than the ordinary amount or apparently with normal price and really with an amount egregiously less than the price.

C: selling a property to clients with egregiously higher price, directly and or indirectly, without respect for the related provisions.

D: providing the grounds for bribery, such as the negotiations for the agreement or receipt of money or property or documents of payment of the client.

E: obtaining or accepting the property or cash payment document or surrendering property of the client, directly and or indirectly, for doing or not doing something that is related to the executive system.

F: taking any other property that can be considered as bribery in the norm, including any kind of clearance or lending without compliance with the criteria or unjustly accepting the liability or responsibility and also taking rewards and considering special discounts and advantage for services to individuals and any agreement or support outside the criteria which leads to the pardon or commutation.

Chapter Two: The duties and responsibilities of executive agencies

Article 2- All systems of Article (16) should apply the followings to achieve the objectives of this Regulation:

A: making transparency in the service sequences, appropriately informing the public, refining and shortening the ways that services are provided to people, developing the office technology, conducting survey of people based on the instructions of the Management and Planning Organization, (honoring people and satisfaction of clients in administrative system and legislations related to reform the administrative systems and procedures)

B: training employees so that they get completely aware of the relevant provisions of the Regulations.

C: choosing inspector or inspectors by ministers and heads of agencies, governors, CEOs, heads of organizations, general managers of the provincial units for the necessary monitoring in a proper manner and providing and present reports within their assigned missions.

D: Encouraging those who have reported the violations of Article (1) of this bylaw and their report has led to a final judgment on the basis of the bylaw, in accordance with the bylaw proposed by Management and Planning Organization is approved by the Cabinet of Ministers.

E: predicting the right to terminate for the executive system in contract with legal entities and individuals to execute the mentioned right, in the cases that with the diagnosis of administration the contractor commits one of the actions in Article (1) of this bylaw.

Chapter three: The duties and responsibilities of employees

Article 3- all the staffs of the systems in the bylaw, if they are informed of happening the measures referred to the Article (1) about themselves or other employees, they will be bound to report it with the characteristics of the bidder individual or individuals to the administrative violations Investigation committees and higher ranked authorities to be pursued according to law.

Chapter Four: the way of investigating the recipients of bribery offenses and administrative punishments

Article 5- the agencies under this Regulation will apply as below in order to track and investigate the offenses of Article (1) and impose the penalties:

A- If the authorities, referred to in Article (12) of the administrative violations Investigation law, are notified by the appointed inspectors of the occurrence of Article (1) violations of this bylaw, by each of the employees or managers or relevant authorities, with respect the importance of the issue, they are bound to impose one of the penalties of the clauses (a) and (b) of Article (9) of the administrative violations Investigation law.

B- In the case of repeating the violation with the report and verification of the inspectors or relevant directors, administrative violations Investigation committees are bound to, with respect to the violation and its sensitivity, condemn the offending employees to one of the penalties prescribed in the Article 9 of the mentioned Act (except in the cases mentioned in the preceding paragraph).

C- In case of repeating the violation of the Article (1) of this bylaw, the offender with the maximum penalties demand referred to in Article 9 of the administrative violations Investigation law, will be condemned to one of the penalties of redeem service, dismissal or permanent dismissal from governmental services by the administrative violations Investigation committee.

Note 1- The steps mentioned in this Article, do not prevent administrative violations Investigation committee procedures in Article 9 without the above process steps, and the committee, according to the importance of the violation, can apply the penalties subject to paragraph (c) for the first or the second time.

Note 2- The relevant authorities according to Article (13) of the administrative violations Investigation law, can make the staff, whose files are referred to the administrative violations Investigation committees, ready to serve up to three months.

Note 3- The executive agencies not subjected to the administrative violations Investigation law, are bound to deal with the offenses set forth in these regulations based on the related laws and regulations.

Note 4: If the inspector under paragraph (c) of Article 2 of this law commits the violations of the provisions of Article1, he will be introduced to the aforementioned committees with the demand of maximum penalties mentioned in the administrative violations Investigation law. If the violation committed by the inspector also is entitled of one of the offenses set forth in criminal law, his files as prescribed in Article (19) of the administrative violations Investigation law will be referred to the competent judicial authorities.

Article 6- About the offenses mentioned in Article (1) of this bylaw eligible of the criminal aspect, especially paragraphs (e) or (b), (c), (d), (e) of this Article, administrative violations Investigation committee is also bound to in compliance with Article 19 of the Investigation law reflects to the competent judicial authorities.

Article 7- If the individuals or legal entities contracted with executive systems commit any of the acts of the provisions of Article 1 of the Regulations, the relevant system will not be authorized to sign a new contract with the mentioned persons for five years and this should be included in the terms of transactions with individuals and legal entities.

Note 1- relevant executive system is bound to announce the specifications of the individuals or legal entities of subject of this article to the Management and Planning Organization.

Note 2: If the mentioned persons commit at least twice the offense of this article, Management and Planning Organization is bound to announce their names to all executive agencies consider the refrain from doing business with these people as part of the general conditions of the treaty.

Article 8- The conditions of the inspector selection under paragraph (c) of Article (2) of this bylaw are as follows:

A- Inspectors should be elected among the faithful, informed and with fide history.

B- Qualifications of inspectors should be confirmed with the assessment of the performance and responsiveness to complaints units of each agency or with similar units.

C- Coordinating, supervising and training of leisure over inspectors work is with the assessment of the performance and responsiveness to complaints unit of each system.

D- Inspectors are responsible to sign the affidavit prepared for this purpose by the Management and Planning Organization.

E- The agencies can, according to the capabilities, efficiency and the amount of responsibility given and outstanding service done by inspectors, by virtue of Article 6 of the Harmonized System of Government Employees Payment, pay up to thirty percent (30%) of the total salaries and related specials as extra special for inspectors.

The extra special mentioned is non-regular and is not subject to deduction of pension and as long as the employee performs the task as inspector and his audit reports are filed is payable with regard to the related system.

F- The systems can pay to up to forty percent (40%) of the inspectors doing outstanding services to track and detect violations, one month salary and benefits in addition to the year-end bonus, in the context of Article (41) Employment Act and similar provisions, as the bonus payment.

G- The inspectors are appointed with the assessment of the performance and responsiveness to complaints units suggest, subject of the Circular No. 1801/35665 dated 25.05.2003, and with the approval of the authorities. The mentioned office can be used with maintaining the position and responsibilities or by changing the positions of the organizations to checkpoint for carrying out the inspection duties. In any case, inspectors will benefit from the extra special for inspection.

H- In the provincial units inspectors are appointed with the proposal of presidents of the provincial organizations or province general directors and verification of the assessment of the performance and responsiveness to complaints units.

I- Inspectors appointed by the province governors, in addition to implementing the provisions of these Regulations in governorates are responsible for inspection and performing these tasks in other provinces.

J- The number of inspectors in any system should not exceed half percent (5%) of the total employees. For special occasions, with the approval of the Management and Planning Organization this percentage is increasable.

Article 9- If any of the staff under the supervision of managers, directors and officials of the organizations of subject of this bylaw, commit of one of the offenses in Article (1), for the first time attention will be given to the directors and officers, for the second time they will be excluded of appointment to the positions listed for six months, and for the third time they will be banned of appointment to the mentioned posts within two years.

Article 10- The Management and Planning Organization based on survey methods of people and clients, inspection reports and other sources, every year is bound to classify and analyze the health and prevalence of bribery of the administrative agencies under this Regulation and reflect the results with executive measures to the president and other authorities. All the entities subject to the regulations for favorable implementation of this article are required to cooperate with the Management and Planning Organization.

Article 11- Management and Planning Organization is bound to implement the necessary steps to justify and follow running of the bylaw.

Article 12- The executive agencies, for the strict enforcement of these regulations are bound to prioritize their most vulnerable units and groups of employees to receiving bribes and seriously reform and priorities the vulnerable points.

Article 13- Each of the units subject to this regulation, are bound to choose one of the deputies responsible for the implementation of honoring people and the satisfaction of customer, by an order, subject of the Canon No. 21619 / T 26394 .K.RH dated 23.8.2002, as the responsible for tracking, monitoring and enforcement of this bylaw and every six months should provide the reports to the Management and Planning Organization. The mentioned agency, after conclusion, will provide the report of the agency and present it to the President and the administrative Council.

Note 1- To establish coordination between the relevant departments in the executive agency, elimination of administrative problems, receiving regular reports and following up the implementation of this Regulation, a working group is formed with responsibility of the vice president under Article 13 of this bylaw, and a member of verification of the assessment of the performance and responsiveness to complaints unit (Working Group Secretary), the responsible unit for improving systems and administrative methods, the responsible for the protection unit, the responsible for coordinating the administrative violations Investigation committees or chief of magistrates committee (if formed) and one of the inspectors.

Note 2- Protection units are bound to submit the results of inspections and their legal actions regarding this canon to the mentioned committee.

Note 14- Management and Planning Organization, Ministry of Culture, Ministry of Education, Ministry of Science, Research and Technology, Ministry of Health and Medical Education and the Islamic Republic of Iran Broadcasting Organization are bound to In order to increase public awareness of the laws, regulations and activities done to modify the operation methods and partnership of people to address the existing problems, plan and reform the Islamic education curricula (culture) for pupils, students, government officials, and all the members of the community to enhance behavioral skills and change in mental attitude and carry out the necessary actions to create suitable anti-corruption culture substrates.

The mentioned systems are bound to cooperate with the Management and Planning Organization of the country.

Article 15- Responsibility to pursue this bylaw will be with the Secretariat of administrative health promotion and fight against corruption campaign will be the bureaucracy and corruption. The mentioned secretariat will submit the progress to the President and the campaign.

Article 16-All the agencies mentioned in the Article (160) of the Fourth Economic, Social and Cultural Islamic Republic of Iran's law – Approved in 2004- and employees of the police and judiciary - Banks and governmental insurance, public NGOs and municipalities are subject to these Regulations.

During recent years, anti-corruption programs in Iran have mainly focused on the reform of administration management and management of finances, but these programs have not been very effective and to scholars and even the public, corruption in Iran has further increased (Danaei fard, 2008).

The ways to tackle corruption can be expressed as a macro and micro approaches. Some of the macro strategies can be the prevention through reform and improvement of the administrative system and education program of effective

management of combating corruption program and efficient and helpful anti-corruption laws and regulations and cancellation of unreasonable regulations and etc. Macro and micro can be explained in administration and management, socio - cultural, political and economic units. (Rahimi Nasab, 2007).

Administrative and management strategies include reducing the procedure steps and accelerating the accountability, reforming the structure of organizations and servicing the people, promoting the participation and participation culture in administrative systems, increasing the accountability to public and strengthening the organizational culture that can be reference to their sense of identity and reduction of direct interaction and facing clients and service providers (One of the important factors of bribes is the direct interaction of client with employees) and etc. (the inspectorate's website, 2007).

Measures such as strengthening the responsibility and the right review viability, increasing the awareness and educating people about corruption, anti-corruption public school education, change in social culture prone to corruption, etc. , can be seen in the realm of social and cultural strategies.

Depoliticization of administration system and election of directors based on competency and reforming laws, and the creation of accurate regulatory agencies and impartial struggle against corruption, applying legal punishments for perpetrators of corruption (Rahimi Nasab, 2007).

The use of mass media in disseminating news and many other factors can be expressed in the realm of civil and political strategies. And also some of the economic strategies for improving the living conditions of government employees, the transparency provisions governing the economic activities, reduction of state intervention in economic affairs, etc., can be useful in the prevention of corruption. (site of State Inspectorate, 2007).

Because the lack of a transparent system of doing things in organizations and administrative environment can be an important factor in fulfilling corruptive activities and behaviors corruption, one of the most effective ways of combating corruption is coming out of the dark and making the administrative structure transparent (the Industrial Management Institute, 2005).

Fighting corruption first of all requires detecting the depth of corruption and also identifying the corrupt people and abusers. One of the effective measures to fight corruption is the identification of corruption context and its underlying causes and the effects of this phenomenon. Investigation of the effects of corruption suggests that corruption hinders the growth of competition and neutralizes the efforts to reduce poverty and social discrimination, corruption undermines incentives and causes social disadvantage or weakens existing institutions, causes political disadvantage or unfair distribution of resources and the economic losses. Currently, the corruption has greatly grown in populations and its anti-developmental outcomes, has got obvious to everyone. Some of the reasons are noted deficiencies in the administrative structures. Within less administrative organizations things can be accomplished without bribery. In many organizations, ministries and municipalities only bribery and relations are useful instead of the regulations. Per granting in different organizations is not based on law and qualification, but occurs based on relationships. Tenure of some employments or memberships of the board of various directors with different titles such as consultant occurs to establish a relationship and abuse of job opportunities is common. Statistics published by the International Transparency Organization, shows that Iran's official health in 2005 is ranked 93 out of 159 countries and in 2006 ranked 105 out of 163. This represents a drop - from the health office view- in the country.

Today, people and governments around the world have taken the issue of corruption more seriously. In addition to valuable developments in the fight against corruption, an independent international organization called "The

International Transparency" in Germany has started its activities with the aim of disseminating information and awareness for the fight against corruption and increase transparency in the government's fiscal operations.

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Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

The Relation between the Citizen Partnership and their Satisfaction from the City Services of Lali Municipality.

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Received: 18 Mar 2015 Revised: 20 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

In this article the relation of the citizen partnership and their satisfaction in the city services of Lali municipality has been measured. The way of collecting the data is documental library one and its kind is descriptivemeasuring one. The volume of the research is 300 people of the Lali residents in five regions (north, south, east, west and center). According to the results of the questioners has been cleared that the citizens have the average rate of satisfaction from the services of the city managers in the frequency of 39.7 and the citizens' rate of satisfaction with the least frequency of 2.3.

Key words: participation, city services, citizens, satisfaction

INTRODUCTION

Increasing the population of the society and city dwelling is a comprehensive phenomenon in the developing countries and such countries have populated cities of about several millions which participation in these countries is a kind of social process in the shape of two tendencies of individuals and groups that the group tendency is named as the traditional participation and the individual tendency as the modern participation.

The way of the traditional participation is equal with the concepts such as cooperation and collaboration, but participation in the modern concept is the product of the 20 century which with the improvement of the civil society in west and making the welfare of the government in Europe and north America has been commenced. Now one should confess that in the present society of Iran we need the multilateral participation of the citizens to move to the city development by overcoming such problems. Although some efforts has been done in Iran, the participation process as a public culture in the citizens thoughts and actions doesn't have a suitable place or it has been palled. Participation as a social deed has taken a root in the societypeople believes and values. The participation strategy is

in all aspects shows the soul of democracy and civility in the governments and for the certainty of the people participation people should attract the confidence, satisfaction and their knowledge in a suitable and reliable space, or else participation in the shape of concept and sociology has not been made or it can be in a very low level.

The satisfaction of the citizens can be known as the effective reaction of the citizens to the municipality actions. The satisfaction subject is one of the management topics. When satisfaction in the organizational operation is important that the human force is one of the important elements of the economic or the commercial production (Azad, 1977, 214).Some organizations like municipalities have an important role in the satisfaction or dissatisfaction of the people. In the organizational operations, some actions like positive and negative perceptions of the citizens toward municipalities.The organizational operations have wide spectrum, the final aim of such operations is the inter-organization relations and citizen satisfaction, though. (Maid Far and Zahani, 2006,137). When the municipality operations can provide the citizens needs and their satisfaction. (2005,16).

Attracting the citizens and the clients' satisfaction causes the confidence augmentation and public loyalty, national concord, public participation and national potency which are the main criterion for assessing the efficiency and the departmental- political system development.

The management of relation with the citizen is our main topics in the governmental management field in improving the citizen participation. The main aim in management of relation with the citizen is to try to give better services to the citizens and increase the satisfaction level and their participation in improving the city work.

The present research is seeking the investigating of the citizen participation and their satisfaction in the city services in Lali until it can have a small step in the society improvement and our city and after knowing the effective strategiesin the citizens cooperation with the municipality, and the main question in the present research is to find suitable participation samples between citizens and the municipality and their ways in cooperation.

The Importance of the Research

Because the municipalities are the only incumbent of the city affairs, with this much of affairs can't manage all the work, and the potential and actual powers are present in the city which are beneficial for the convenience and thriving the city, and can help the municipality organization in their management and have a kind of participation in.what is under consideration in the present situation of the society which is the ethical democratic government and civil society is that in our decision making and planning directly people cooperate which this act is the eminence of the improvement of the democratic and seeking cooperation society. According to the long-time actions of the municipalities and lack of the financial sources and municipality facilities , the unlimited necessities of the citizens and not knowing the citizens needs and understanding the present conditions in this part of the country and the weak and strong points for the scientific investigations and the effort for the daily improvement are essential.

This research has brought the problems on this way and has given some pieces of suggestion.

The Method of the Research

There are 18000 people of the citizens (men and women) which has been investigates according to the east, west, north and south of the city.

In this research the racemose sampling has been used which for this reason ,LaLi is divided into five regions (east, west, north, south and center) ,and sampling has been done from among them, and for increasing the credit of the

research, the five percent questionnaires have been distributed which have been back in the same number of the samples.

The statistical action has been done on 300 questionnaires which are consist of 55 peoplein the east parts, west 55, south 55 and 80 people in the center. In each of the regions the questionnaires have been gathered in a non-centric way.

The Participation Meaning

Participation consists of the governmental and volunteer actions from the members of a society in the quarters, city or the village, and directly or indirectly are in forming the society life. (Mohsen Tabrizi, 1997, 93)

The Participation Specialties

Participation is on the condition of the people equalities and depends on their freedom.
Participation is the right of the people and more than other things it needs the people's conscious action.
Participation is a phenomenon with the stable product and the final improvement.
Participation is a quantitative and qualitative action and has some degrees.
Participation has two sided results, and if it wants to be effective it needs some basic changes in the thoughts and action which should commence from the inside of the society and in the acceptable and stable forms of the society and the government flourishes. (Ansari, 1997, 123)

The Precedent of the Research

Faghihi and Salarzehi (2006) have done a research with the subject, the city management words in the European countries, which this article has investigated the official words in the municipality of German, Netherlands and Switzerland and tries to investigate the new political changes in modifying the management patterns of theses samples. The new discussion of the local and city governing and making the ways for people participation is the common point in the models under investigation.

YazdanPanah (2007) has done a research with the title of the Impediments of the social participations of Tehrani citizens. This article has measured the rate of the residents of Tehran participation. The topics has been investigated in this research are informal social participation and formal social participation which the conditions show that the volunteer participation in the non-governmental organizations are not in good conditions and the informal social actions have better conditions. On the other hand, some findings show that the investigated people of the society see many impediments for their participations.

Rabani et.al has done a research with the title 'investigating the effects of economical social welfare on the rate of the people participation in city affairs' in Isfahan. This research is about measuring the relationship between social and economic welfare and the extent of the participation of the citizens in the city affairs. According to the obtained results, there is a linear and meaningful relationship between the economic and social welfare and city participation of the citizens, and the results show that if the city governors absorb the people's confidence, and by this way increase people satisfaction, so their belonging feeling to the city increases and augments their participation.

Baekpoor et.al (2013) has done a research with the title of 'measuring the municipality actions in measuring the people satisfaction from the city services '(the sample is the 1,11 region of Tehran). The main reason of doing this research is measuring the citizens' satisfaction of the municipality action in the local level and the effective factors on it. In this research satisfaction is a dependent and independent variables or the operation indexes are consist of 17

development duties and cultural and services of the municipality which the quality of doing them has a direct effect on the quality of the city and it augments the people's satisfaction. The way of this research is by the measurement of the questionnaires. The results of the research shows that the rate of the citizen satisfaction of the city municipality in both regions is average, but from the social specialties the answerers like gender, age and the extent of the knowing are the duties of the municipalities, and some meaningful differences between the city residents of the two regions.

Hemilton and Keriptone (1991) in their research have investigated the determiners of five aspect of the services (touchable, answering, the confidence capability and unanimity) in the park and concluded that the responsible people in the park should know what definition people have of the quality of the services, and that the touchable aspect is more important than others and knowing the quality aspects are the good guides for preparing and measuring the services.

The Theoretical Framework of the Research

Today the cities with the increasing of the explosion of the population take a step against the improvement and civilization. This matter can be because of being away of the citizens participation in planning and projects, so that the role of the citizens faded, while the proportion of the answering and accordance of the city management depends on their relations until the realities, ideas, requests and suggestions can move to the formal organizations. From the other side governing and city management not only covers the formal organizations, but also the informal and non-governmental ones, too. (Nejati, Hosseini, 2002,18)

So, with the importance of the subject to the citizen and citizen participation has another meaning and is the assembly for a special aim. (Musavi,2003,87)

In the present research is used the theoretical framework of AlaviTabar model about the rate of the people's participation, which is obtained from Fish Bain-Izen's point of view which id described here briefly.As it can be seen in the figure, participating by a person has been done who first he intends to do that ,and have a motive for participation. Second, there is the possibility for the person to participate. Each of the factors (intention and purpose and possibility of participation) is specified under other factors. The first factor in participation is the person's information.

The second factor of participation is the person's idea about the consequences of participation. The person who knows briefly what participation is should think about this matter that what is the result of participation? Some knows the consequence of participation the possibility of defending the personal and family profits in public decision making phenomena and in fact see it as a toll for defending themselves.

The third factor in forming the intrinsic motives is the value of judging about the consequences of participation. The above 3part factors make the extent of the person's participation (Alavi Tabar,2001,26).

The other factors that can have a role of facilitator or impediment in people's participation are the person's past record about participation. The personalities are important, too. From the necessary time for participation the participation in group works and good social points of views the age and gender can be important, too.

If all the above factors are favorable, the participation intention will be created in the person, but the participation intention is not enough, the existence of participation possibility is important, too. From one side, participation refers to the legal and organizational part of the society. The laws of the society from one side distinct the acceptable social frameworks and from the other side the people's rights and related duties of these obligations.

Descriptive Statistics

Nowadays, in Iran the people only participate in managements by councils, and on participation have neither in the way of doing city plans nor in city management, while it should be paid attention in the people's role in city management. Now with the lack of much participation in management of the cities of Iran and also because of the participation discussions in big cities needs the participation in small cities so the citizen participation in smaller cities has been done.

According to the data analysis gathered in the forms of questioners and been mentioned in the forms of charts and tables and the gathered analysis being mentioned.The mean and the standard deviation of the answered citizens in order are 34.67,11..73 years and about 67.3 percent of the men and 32.7 percent of the women participants. The citizens with the office worker jobs had the frequency of 24.3 and the citizens with the other jobs were with the least frequency of 8.0.

The citizens with the average levels of education had the most frequency of 35.7 percent of the samples and the citizens with the elementary and M.A degrees and over had the least frequency of 5.7 percent of the sample. The mean and the standard deviation of the citizen's dwelling in the studied regions had been 27.1 and 11.91 years.The citizens with the average satisfaction of the city mangers' services had the most frequency of about 39.7 and the citizens with very much satisfaction had the least frequency of about percent of the sample.

The citizens of the centric parts had the most frequency of about 26.7 and the citizens of the other parts with the equal ratio of about 18.3 percent of the sampleIn the variable the possibility of participation, the mean and the standard deviation in order are 26.60 and 8.88, in the variable the satisfaction of the city services 53.00 and 11.28, and in the variable the intention and purpose of participation 41.41 and 8.49, in the variable citizen participation, the mean and the standard deviation are in order 41.36 and 8.01.

The foundlings about the assumption of the research

The present research is included if the following hypotheses which each hypotheses is presented with the acquired results of the analysis in this part.

The first hypothesis: there is a relationship between participation and the citizen participation pfLali.

As you can see in table2, there is a meaningful positive relation between the participation possibility and citizen participation. (p=0.0001 and r=0.37). so the first hypotheses is confirmed. On the other hand, the more citizen participation the more their participation.

The second hypotheses: there is a relationship between the city services and citizen participation in Lali.

As you can see in table.2, there is a positive relationship between city services and citizen participation in Lali. (r=0.39 and p=0.0001). so according to the second hypotheses, the increasing of city services of the citizens had been along their citizen participation.

As you can see in table.3 there is a meaningful positive relationship between the between the purpose and intention of participation and city participation in Lali.(p=0.005 and r=0.16). so the third hypotheses is confirmed. On the other hand, with improving the intention and purpose of participation, the citizen participation increases

As table.4 shows, the citizen participation between Lali citizens from the possibility of participation, satisfaction of city services and the purpose and intention of participation are meaningful ($p<0.0001$ and $F=19.67$). the possibility variable participation with the index of β 0.17 and the satisfaction variable with the β index 0.27 can forecast positively and meaningfully the citizens participations ,and also R2 shows the 16% of the variance of the citizens are cleared by the above variables.

CONCLUSION

In this research three hypotheses has been brought up and after testing them the following conclusions are obtained: the first hypotheses investigates the possibility of participation and citizen's participation in Lali. According to the results ($P= 0.0001$ and $r= 0.37$) .here is a meaningful and positive relation between these two variables. On the other hand, the more the citizens participation, the better participation. So one of the factors that makes the citizen's participation possible is the equality conditions in decision makings, the justly division of facilities in all the parts of the city, the clarity of the city laws, the city rights equality… . These factors are the aspects of participation which concords with the Ansari(1998) and Ghafari (2013) and different views. These foundlings (the specialty and participation fields) which provides the people's satisfaction.

The second hypotheses which investigated the relation between satisfaction of city services and citizens participation of Lali. According to the acquired results ($P= 0.0001$ and $r= 0.39$). There is a direct relation between these two variables. On the other hand, increasing the satisfaction of citizen's city services is along with the increasing of participation. Theses conclusions concord with the foundlings of Sheikh Mohammadi and TavaliZadeh (2006), Azad (1997), Moeeed Far and Zahani (2006).Hayati (2003) of the citizens' satisfaction with their participation.

The third hypotheses which investigates the intention and the purpose of participation and citizen participation of lali. According to the obtained results ($p=0.005$ and $r=0.16$) there is a meaningful positive relation between them. On the other hand, with the improvement of the purpose and intention if the citizens' participation, the citizen participation increases. The results of this research concord with the foundlings of AlaviTabar(2001) and the Fish Baye- Izen 's hypotheses. In this view the main hypotheses is that people think about their own behavior, and for obtaining some results and preventing of some others do some logic selections. So the intention and purpose of the person has an essential role in clearing the person's behavior. In determining the person's intention and purpose individual and social factors interfere. The personal element is related to the person's tendency which are affected by two factors: the person's belief of own action consequences 2. Measuring the obtained results of own behavior, the social element is related to mental manner, and show thesocial origin and influence.

The research suggestions

First hypotheses: there is a positive and meaningful relation between participation and citizen's participation of Lali.

Creating the local councils in the quarterss and encouragingthe people in becoming members in theses councils and increasing their rates of knowledge.

Acknowledging about the ways of people's participation in city affairs by T.V advertisement, etc ..

Increasing the direct and face to face transactions of the people in charge with the people in the molds of city councils and creating this feeling in the people that the people in charge are sympathetic to the people.

Increasing the policy making bases in public participation in decision makings and social economic and cultural improvement plans.

City life structure has created some conditions that public benefits padded its color against the individual benefits, according to the wide migrations of the villages to the cities and also for the improvement and strengthening the rate of the feeling of being in the society with presenting the public trainings related to the city dwelling culture and obeying the city laws and regulations and educating the rights of city life to the citizens increase their social participation.

The private part membership and citizens in non-governmental organizations and people's institutions and trade unions as an agent in making the participation , so increasing in nongovernmental organizations, civil institutions in different social, cultural and living and other city affairs and empowering them by governmental supports in citizens cooperation as a suitable and humanity tool.

Eliminating the present defaults in cities cause different problems for the citizens and increasing their confidence .

According to the direct relation between the dwelling past record in the location and the rate of social participation which participation and management plans in city affairs with attracting the people's participation with their residency.

Second hypotheses: there is a relation between the city services and citizen participation in Lali.

Acknowledging the councils of the people and their problems by different ways , because the councils can transfer the local problems to the public thoughts, attract the public thoughts and finally see the people's participation.

Delivering the duties to the building credits of local councils which its main effect is on consigning this volition, making a healthy competition between the quarters and increasing the quality levels.

Making confidence between people and the ones in charge and increasing the social confidence between the residents.

According to the fact that if we increase the rate of people's satisfaction and private part in city services , there is more tendency for participation, so doing some actions for public welfare and facilities, city service progress and educational cultural, recreational facilities and making centers for the people's suggestions in giving services for attracting the people's participation in city affairs.

Third hypotheses: there is a relation between the intention and purpose of citizen participation.

Incessant of people's wants as we can and solving their problems for changing their attitudes for the municipalities.

Making the positive attitude for social participation and attracting public confidence toward the people in charge and in other levels making confidence.

Making local councils in quartering levels which this way of participation is the best way for participation in improving the environment.

Dong the study for measuring the people's views in participation in all social cultural and economic aspects for knowing the potential behavior of people about participation and using the results in planning participation management for different people.

Making local funds for loan and saving accounts and job making with participation and investigation of the people for using the public, governmental and private sources.Holding the meetings with different organizations of the cities about giving the people's problems and the organizational related ones.Increasing the cultural level of people with doing the projects in the form of competitions and giving prizes.The correct acknowledging of the councils about the area problems by different ways. Because the councils can attract the public thoughts and confidence, and finally we can see the people's confidence in different aspects.

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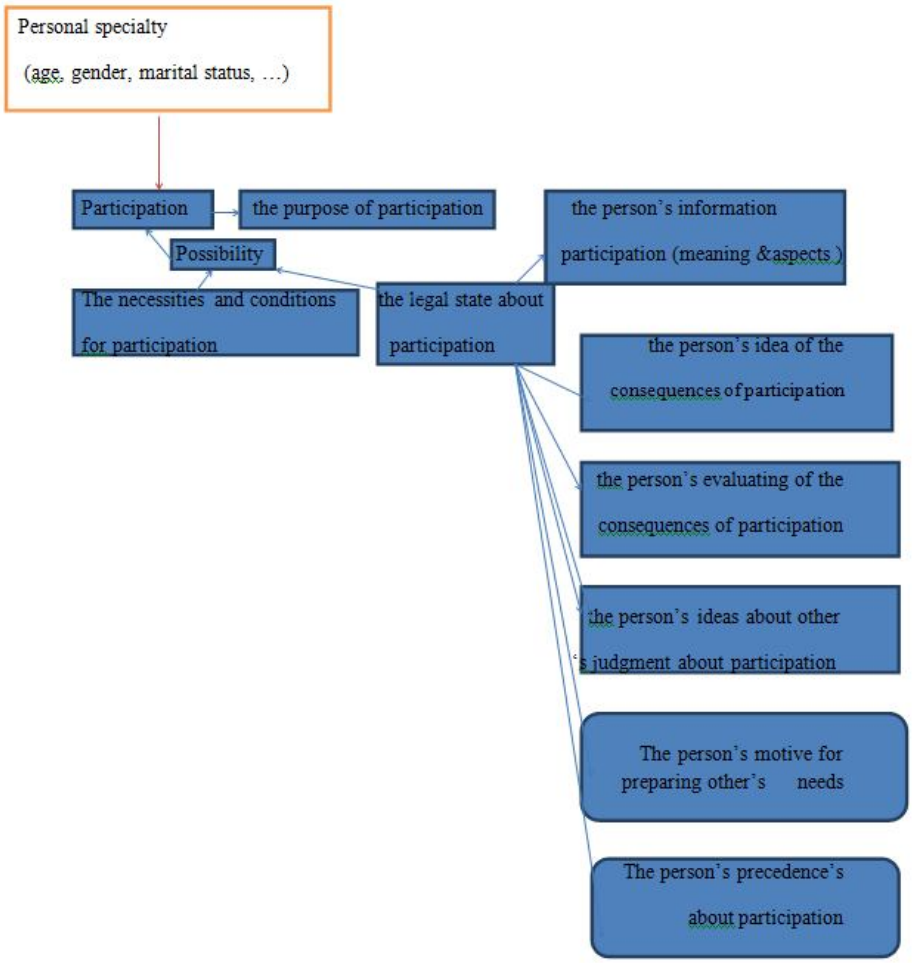

Fig.1- The effective factors on the rate of people's cooperation

Table.1: The simple relation indexes between the possibility of participation and citizens participation

The forecasting variable	Statistic index Criteria variable	Relation index (r)	Meaningful level (p)	Sample number
Participation possibility	Citizen participation	0.37	0.0001	300

Table. 2 The simple relation indexes between satisfaction of city services and citizen participation

The forecasting variable	Statistic index Criteria variable	Relation index (r)	Meaningful level (p)	Sample number (n)
City services satisfaction	Citizen participation	0.39	0.0001	300

Table.3 Third hypotheses: there is a relationship between the purpose and intention of participation and city participation in Lali.

The forecasting variable	Statistic index Criteria variable	Relation index (r)	Meaningful level (p)	Sample number
Purpose and intention of participation	Citizen participation	0.16	0.005	300

Table.4 Forecasting the citizen participation according to the forecasting variables

The previous variables	R	R2	F	P=	β	T	P=
1.Participation possibility	0.41	0.16	19.67	0.0001	0.17	2.00	0.047
2.Service satisfaction					0.27	3.26	0.001
3.The purpose and intention of participation					0.02	-0.451	0.652

Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Analysis and Determination of Regional In-situ Stress Orientation Using Image Log Data

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Received: 15 Mar 2015 Revised: 19 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

Knowledge of stress orientation is crucial for the understanding of many processes in the earth's crust such as tectonic development, earthquake occurrence, and fluid transport along faults. In the case of the South-West of Iran, which is a prolific area for hydrocarbon production, this knowledge also plays an important role for engineering decisions with respect to wellbore stability and reservoir management. However, nearly all data published for this area for depths less than 6 km are based on the evaluation of caliper data, a method with intrinsic limitations. For greater depths stress orientation is derived from earthquake focal plane mechanisms. This article presents stress orientation data derived from an extensive set of image logs throughout the South-West of Iran. The analysis is based on the identification of compressive and tensile failures of the borehole wall in electrical and acoustic borehole imaging logs in 10 wells of different oil and gas field in this area. This method is found to be highly reliable and capable of delivering detailed and accurate results, and thus is far superior to the analysis of breakouts from caliper logs. The analysis of image logs shows that the stress orientation is consistent both regionally and with depth. Strong variations in stress orientation, which are often interpreted from earlier analyses of caliper data, are not observed.

Key words: Stress, Borehole, Failure, Image Log, Breakout.

INTRODUCTION

Knowledge of the present-day tectonic stress is an essential issue in petroleum exploration and production, and, in particular, is a key parameter in borehole stability, reservoir drainage and flooding patterns, fluid flow in naturally fractured reservoirs, hydraulic fracture stimulation and seal breach by fault reactivation [1].

The present day state of stress is described by determination of the stress tensor. It is commonly assumed that one principal stress acts vertically in sedimentary basins and thus the stress tensor can be simplify to consist of four components, the magnitudes of the vertical, maximum horizontal and minimum horizontal stresses in addition to the orientation of the maximum horizontal stress. Of these four components, determination of the maximum horizontal stress (SH) orientation has received extensive attention in recent 20 years, particularly with regards to the control of in-situ stresses on subsurface fluid flow and fault reactivation. Fractures that are most susceptible to tensile or shear failure in the present day stress, typically those striking approximately parallel or within 30° of the maximum principal stress orientation, are often observed to transmit the largest volumes of fluid. Furthermore, extensive analysis of flooding operations has observed that fluid flow is enhanced and pumping rates more strongly correlated between well pairs that are located parallel to the present day SH orientation.

Importance of understanding the present day maximum horizontal stress orientation is further highlighted by World Stress Map (WSM) Project, which has spent over 20 years building an extensive freely available repository of present day stress information. The 2008 release of the World Stress Map Project contains 21,750 present day stress indicators from all over the world and reveals the complexity of the global stress pattern [2]. Early studies of the present day stress field revealed that the primary, plate-scale stress field is controlled by plate boundary forces such as ridge push, slab pull and resistance at continental collision zones coupled with large intra-plate forces such as gravitational body forces near mountain ranges [3]. Furthermore, it is knowledge of stress orientations at smaller basin and field scales that has critical importance for petroleum applications such as wellbore stability, and hydraulic fracture stimulation.

Knowledge of the present-day stress orientation is particularly important in Iran, which has an extensive and mature petroleum exploration and production industry, and is also prone to stress related geo hazards such as earthquakes. Yet, the 2008 World Stress Map database contains very little present-day stress information for Iran and no stress data from petroleum wells [4].

Indeed, all of the stress data currently available for Iran is derived from earthquake focal mechanism solutions from events that are typically at depths of ten kilometers or more, and which might not be relevant for petroleum applications, particularly in areas possibly detached by salt or low-angle faults. Furthermore, the majority of these earthquake focal mechanism solutions are located along the boundary between the Arabian and Eurasian plates, and there are concerns surrounding the reliability of stress information derived from earthquakes near plate boundaries. First determinations of stress orientation based on the analysis of image logs were published by Wiprut and Zoback (1998) for the Visund field in the northern North Sea and by Brudy (1998) for the northern North Sea. These data are characterized by a far smaller scatter and a nearly E-W orientation of SH consistently observed in all eight wells, in which drilling induced fractures (DIF) were detected. In this study we describes the results of the analysis of stress induced borehole failures (such as DIF, borehole breakout) on the South-West of Iran using modern image logging techniques to determine the present-day stress orientation in the South-West Iran.

MATERIALS AND METHODS

The subsurface of the continental crust rarely stays at hydrostatic stress condition, the stress state under which all points in the crust are subjected from all directions to equal stresses ($\sigma1 = \sigma2 = \sigma3$). However, such stress conditions

are rarely met in subsurface of the earth as many structural movements keep taking place in it. The larger portion of the disturbance in the equilibrium in the stress state is contributed by the plate movements that ultimately result in the formation of regional stress system for the area bounded by them. However, sometimes the regional stress is completely overprinted due to stresses localized to a certain area. The source of local stress system may be associated with faults, folding, diapirism and etc. The orientation of such local stresses may be changed abruptly over short distances in any area.

The wells drilled in areas subjected to such kind of unbalanced stress system often exhibit two types of borehole failures, shear failure and tensile failure, when the rocks drilled by them are replaced with the drilling mud. The rocks can bear both compressive and shear stresses but the fluid filling the borehole can bear only compressive stress and not shear stress. Consequently, concentration of stresses takes place around the borehole in the form of hoop stress or tangential stress.

When the mud weight is too low, the maximum hoop stress becomes much higher than radial stress. Consequently, a shear failure of rocks exposed to the borehole takes place, which is exhibited in the form of borehole elongation on the orthogonal calipers of UBI and as long dark regions on the UBI images that are 180 degrees apart. On the contrary, when the mud weight is too high, the radial stress increases and the hoop stress decreases; consequently rock around the borehole comes under tension and fails in tension; the fractures so created are called drilling induced fractures. It is manifested in the form of a fracture seen by the images oriented at 180 degrees from each other. Generally, in vertical wells and those with smaller deviation, the orientation of borehole elongation is aligned with the trend of minimum horizontal stress (Sh). Similarly, the strike of drilling induced is aligned with the trend of maximum horizontal stress.

Excavation of a borehole in a prestressed medium leads to a concentration of stresses around the wellbore. For a well aligned with a principal stress axis, high compressive stresses are predicted in the direction of the least principal stress in the plane perpendicular to the wellbore axis and low compressive or even tensile stresses in the direction of the greatest principal stress in this plane.

This stress concentration around the wellbore eventually leads to the failure of the borehole wall. Two types of borehole failures are commonly used to determine the orientation of the principal stresses, breakouts and DIF (Fig2). While the analysis of breakouts, especially from caliper logs, is a well established and accepted method, the analysis of DIF is relatively new and dependent on the availability of image logs.

Other types of borehole failures such as keyseats or washouts provide no information on the stress orientation, as they are induced solely by mechanical wear or by a combination of technical influences and the stress concentration at the borehole. Failure of the borehole along natural faults cross cut by the wellbore contains information on the state of stress but is difficult to observe and only a few incidents are reported in the literature.

Detection of breakouts has commonly been based on the analysis of four arm caliper logs. However, using this method it is difficult to exclude drilling induced keyseats from stress induced breakouts. Fejerskov (1996) showed that this intrinsic problem of the analysis of caliper logs may be the reason why some of the published stress orientation data, based on this type of analysis, are biased and indicate more variability in stress orientation both regionally and with depth, as is really the case in nature. Very recently, Jarosinski (1998) proposed a method for identifying breakouts using six arm caliper logs which measure six independent radius values instead of the two diameters recorded by the four arm tool.

Detection of DIF has proved to be a reliable and accurate method to determine the stress orientation [5]. Analysis of image logs has shown that electrical imaging logs are best suited for the observation of this type of failure. On the other hand, breakouts are more accurately observed in electrical imaging logs. For later use and comparison of the

stress orientation data it is important to assign a quality to each data point. For breakouts the quality standard applied is defined in Zoback (1992) and is used in the World Stress Map Project(2008).

Two characteristic types of DIF can be identified from analyses of image logs. (A) Pairs of traces parallel to the borehole axis offset by 180º and not interconnected around the wellbore wall. These fractures are initiated during the drilling process as pure tensile fractures, but do not appear to propagate significantly into the rock surrounding the borehole, and are thus limited to the borehole wall (Fig 3). (B) Fracture traces 180º offset at the borehole wall but inclined with respect to the borehole axis. This type is called “en-echelon” fractures as their geometry looks very similar to en-echelon fractures known from geology. Additionally, DIF are characterized by a typical length ranging between 0.1 and 3.0 m and their rough trace at the borehole wall which is probably caused by small scale heterogeneities in the rock. Analysis of the state of stress around an arbitrarily oriented borehole in an isotropic elastic medium shows that DIF are aligned with the borehole axis if one of the principal stress axes is aligned with the borehole axis, while en-echelon type fractures are initiated if none of the principle stress axes is aligned with the borehole axis. At present, research is concentrated on the use of DIF for the estimation of the magnitude of the greatest horizontal principal stress SH [6].

Breakouts are zones of failure of the borehole wall in response to high compressive tangential stresses $\sigma_{\theta\theta}$. The failures elongate the borehole cross-section from the original circular shape and are observed by four/six arm caliper measurements of acoustic image logging [7]. In a vertical well, breakouts form in the direction of the least horizontal principal stress Sh, which means they occur perpendicularly to the orientation of DIF at the borehole wall (Fig. 3 and Fig. 4).

Zoback (1985) explain the shape and occurrence of breakouts applying a Mohr Coulomb failure criterion. Calculations of areas in which the compressive rock strength is exceeded by the stress concentration around the borehole result in contours of the initial failure zone, which closely resemble the shape of breakouts as inferred from borehole observations. However, this model is not capable of explaining the stabilization of breakouts as the increasing ellipticity of the borehole causes an increase in the stress concentration for elastic material. Stabilization is probably achieved by the formation of a plastic yield zone in front of the breakout, which decreases the stresses in this area and thus inhibits further development of the breakout.

The failure mechanism responsible for the formation of breakouts is still disputed. Experimental studies show that both compressive shear failure and extensional spalling can create breakouts. Which mechanism is acting, is determined by the relation of the mud pressure to the formation pore pressure. If both pressures are equal and, hence, no effective pressure is acting on the borehole wall, extensional spalling is enhanced.

In the case of high fluid pressure and low pore pressure, extensional spalling is inhibited and shear failure preferably occurs [8]. It can be shown that elastic anisotropy in rocks does not significantly influence the position and shape of breakouts. Strength anisotropy can however, influence the orientation and also the shape of breakouts. Thus, in cases of severe strength anisotropy, the breakouts do not reflect the stress orientation. Steep bedding or foliation planes may also cause spalling of the borehole wall in the up and down dip directions which is not induced by the stress concentration at the borehole wall, and thus contains no information on stress orientation.

The image data include some electrical images (Oil Base Micro Imager (OBMI), Formation Micro Scanner (FMS), Formation Micro Imager (FMI)) while there are some acoustical images (Ultrasonic Borehole Imager (UBI)). In accordance with the different hydrocarbon exploration and production activities, the image logs are from the Marun, Ahwaz, Parsi, Bibi-Hakimeh, Cheshmeh-Khush field and Abadan plain.

Orientations of regional stresses in the Arabian Peninsula (measured by Akbar et al, ADIPEC 1996) has been stated as are NE-SW for the maximum horizontal stress (SH) and NW-SE for the minimum horizontal stress (Sh). Here we are

analyzing the image log data of some of the most important oil fields in the South-West of Iran to determine the present-day stress orientation.

This study is executed in three phases; processing and interpretation of image log, classification and analysis of data and finally interpretation of results. The first acquired raw FMI digital data was loaded into professional software. Speed correction, eccentering correction, normalization and image filtering had been done before starting interpretation. Next generated image log was interpreted in order to recognize structural and sedimentological features. Apparent orientation of interpreted features converted into true orientation by taking into account borehole azimuth and deviation. At last the results were interpreted and compared with previous findings about Asmari fractures.

Structural features were divided into two main parts; fracturing and compactional features. Open and filled fractures, fault and flexural slip were fracturing subcategory while structural and compactional stylolites, solution seams and bedding plane were compactional sub-categories. The main aim of image log interpretation was identification of these two major parts of structural features. In this study compactional features weren't included and only the fractures were taken into account. Summaries of interpreted features in studied well are described below.

RESULTS AND DISCUSSION

A total of 10 image logs have been studied in this paper. Stress-induced borehole failures were detected in all of them, which were analyzed in this study (Table 1). The average orientation of the greatest horizontal principal stress, SH, is N 52º and the average orientation of the minimum horizontal principal stress, Sh, is N 142º for this 10 wells. The results from the data clearly show that the regional stress orientation is quite consistent but varies over longer distances. The overall low standard deviations of the breakout orientations highlights that breakout orientations are consistent with depth throughout each well. Furthermore, the largely ENE–WSW SH orientation observed in wells is broadly consistent with SH orientations derived from the absolute plate motion direction of the Arabian plate. Hence, the largely ENE–WSW SH orientation observed herein is likely to be associated with forces driving the Arabian plate motion in addition to resistance forces.

DIF are observed over extended intervals along the boreholes with a quite consistent orientation, indicating that the stress orientation is consistent not only regionally but also with depth. Also in these wells the orientation of the failures is quite consistent with depth. Many earlier analyses describe a stress field with highly variable stress orientation for different geological formations, and also for different wells in a single geographic region. This variability is often explained by the influence of geological heterogeneities, such as salt diapirism, faults, and folds. This is expressed by the fact that in most of the wells, for which the stress orientation is determined from image log analysis, the stress orientation is very consistent vertically and laterally.

Therefore we presume that some of the variability seen in analyses of caliper data may be related to the shortcomings of this method and do not reflect true variations in stress orientation. Often changes in stress orientation are explained by the influence of faults in close proximity. The principal idea behind this argument is that the fault is seen as a plane with reduced or even vanishing shear stress on it. In fact this means that one of the principal stresses close to the fault plane has to be (nearly) perpendicular to this plane. However, laboratory investigations of the coefficient of friction indicate that for almost all rock types and for common temperatures the coefficient of friction between 0.6 and 0.8. This means, that in general, fault planes are able to support shear stresses up to the frictional limit.

Horizontal wells deviated towards the presentday SH orientation are typically the most stable in thrust faulting stress regimes, as is expected to exist within the study region. Deviation of wells towards the present-day SH orientation in thrust faulting stress regimes reduces both the absolute stress and differential stresses acting on the borehole , resulting in the least possible circumferential stress concentration around the wellbore and thus reducing

the likelihood of breakout and associated drilling problems such as struck pipe and wellbore collapse. Hence, we suggest that drilling of production wells that are highly-deviated or horizontal and oriented approximately towards the NE or SW is likely to both intersect more hydraulically conductive fractures and reduce wellbore instability problems.

The average orientation of the greatest horizontal principal stress, SH, is N 52º and the average orientation of the minimum horizontal principal stress, Sh, is N 142º for this 10 wells. The results from the data clearly show that the regional stress orientation is quite consistent. These results is similar to map of the regional stresses in the Arabian Peninsula based on borehole breakouts and drilling induced fracture data and the World Stress Map as we expected. The correlation between SH orientations derived from breakouts and focal mechanism solution in this region, suggesting that focal mechanism solution data near continental collision zones may provide reliable information of the stress orientation. Stress-induced failures of the borehole wall are observed in only about 60% of the wells intervals analyzed in this paper. This does not support the conclusion that the horizontal stresses are isotropic. It just indicates that the stress difference in combination with the borehole conditions (downhole P and T) was insufficient to induce these failures. According to results of this study we suggest that drilling of production wells that are highly-deviated or horizontal and oriented approximately towards the NE or SW is likely to both intersect more hydraulically conductive fractures and reduce wellbore instability problems.

ACKNOWLEDGEMENTS

The authors thank Mrs. Mohamadiyan for her technical assistance during the processing the data and finalizing the results. We also thank the National Iranian South Oil Company (NISOC) for providing the Data of the wells and software.

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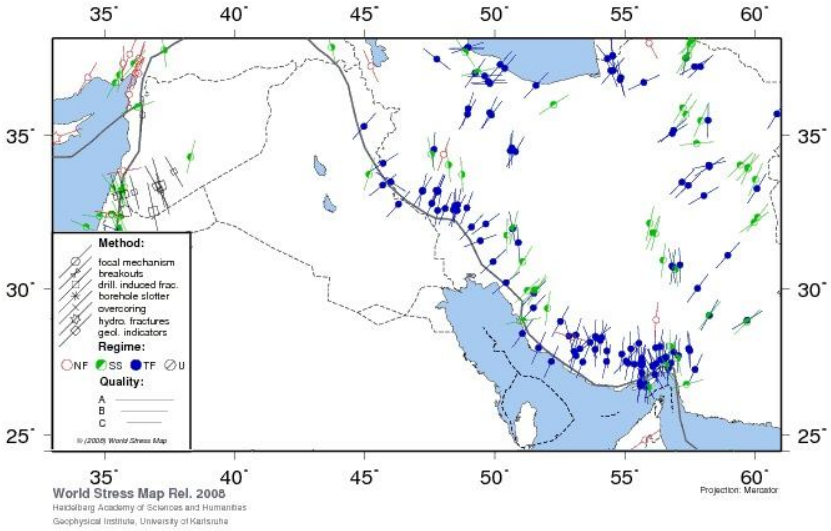


Fig1. SH orientations in Iran from the World Stress Map database. The SH orientations observed from borehole breakouts herein are consistent with the focal mechanism solutions observed in the Zagros Mountain belt.

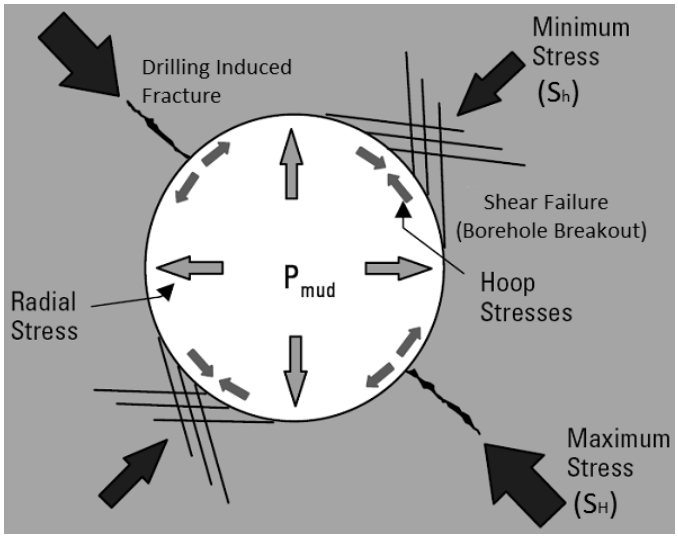


Fig2. Sketch of breakouts and DIF occurring at a wellbore with respect to the orientation of the horizontal principal stresses. DIF always occur at an angle of 90º to the breakout orientation and thus indicate the orientation of SH.

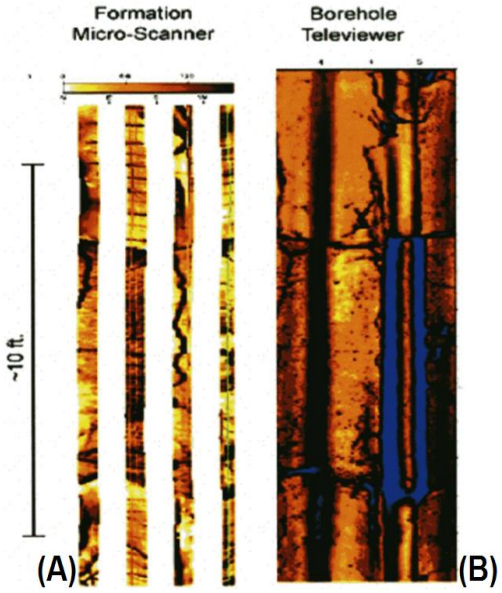


Fig3. (A) Resistivity image of the borehole wall recorded by a Formation Micro Scanner tool. Dark colors represent low resistivity and vice versa. Intermittent dark traces on pads 1 and 3 indicate a drilling induced fracture. Notice that the DIF are 180º apart at the borehole wall and are not interconnected around the borehole like sinusoidal traces of natural fractures or bedding planes. (B) Borehole televiewer image at the same depth showing the same fracture dip and azimuth.

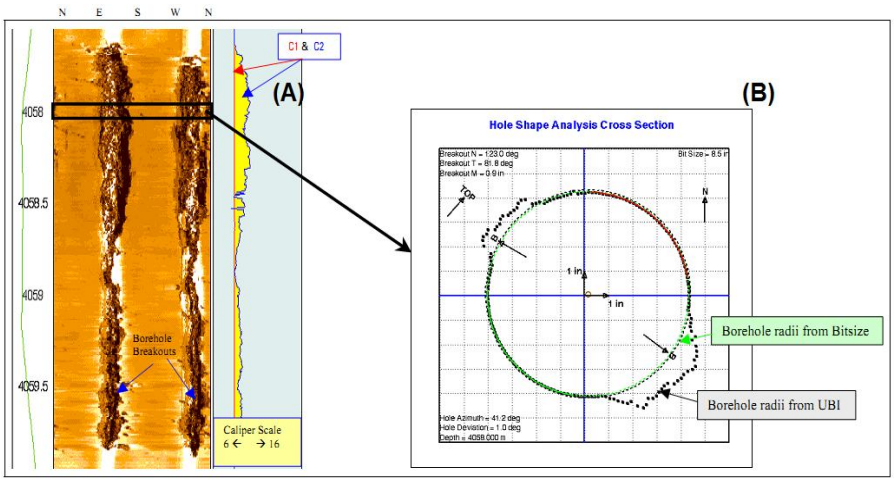


Fig4. (A) Acoustical borehole image (amplitude of reflected pulse) over a depth section of 8 m. Dark red colors indicate the location of low reflected amplitude caused by breakout zones. Notice the location of the breakouts 180º apart at the borehole wall. (B) Hole shape analysis cross section at the same depth showing the size and azimuth of breakout.

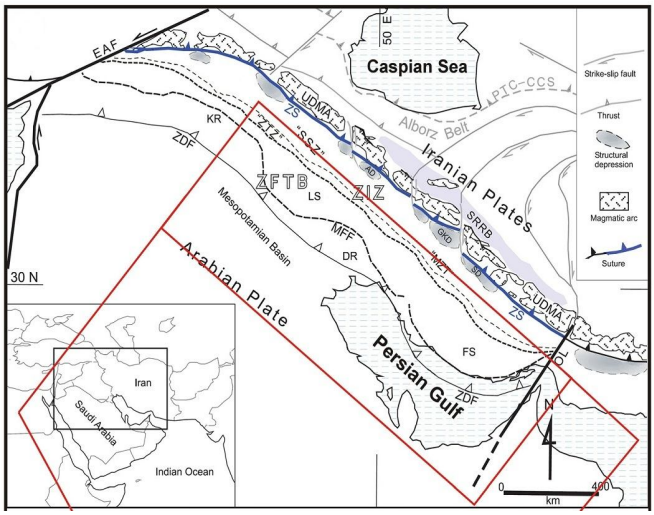


Fig5. Main tectonic features and kinematics of the Arabia/Eurasia collision.

Table1. Average Direction of Sh & SH in the wells according to borehole breakout, DIF and caliper log data.

Field	Well	Image Log	Caliper Log	S_h Direction	S_H Direction
Ahwaz	A	FMS	Yes	N 125	N 35
Marun	B	OBMI - UBI	Yes	N 150	N 60
Marun	C	OBMI - UBI	Yes	N 140	N 50
Marun	D	OBMI - UBI	Yes	N 145	N 55
Parsi	E	OBMI - UBI	Yes	N 150	N 60
Bibi-Hakimeh	F	FMI	Yes	N130	N 40
Cheshmeh-Khush	G	UBI	Yes	N 118	N 28
Cheshmeh-Khush	H	UBI	Yes	N 160	N 70
Abadan Plain	I	FMI	Yes	N 148	N 58
Abadan Plain	J	FMI	Yes	N 158	N 68

Latest Researches …

Researchers at Eindhoven University of Technology (TU/e) and FOM Foundation today present a very promising prototype of this in the journal* Nature Communications*. The material gallium phosphide enables their solar cell to produce the clean fuel hydrogen gas from liquid water. Processing the gallium phosphide in the form of very small nanowires is novel and helps to boost the yield by a factor of ten. And does so using ten thousand times less precious material.

The electricity produced by a solar cell can be used to set off chemical reactions. If this generates a fuel, then one speaks of solar fuels -- a hugely promising replacement for polluting fuels. One of the possibilities is to split liquid water using the electricity that is generated (electrolysis). Among oxygen, this produces hydrogen gas that can be used as a clean fuel in the chemical industry or combusted in fuel cells -- in cars for example -- to drive engines.

Solar fuel cell

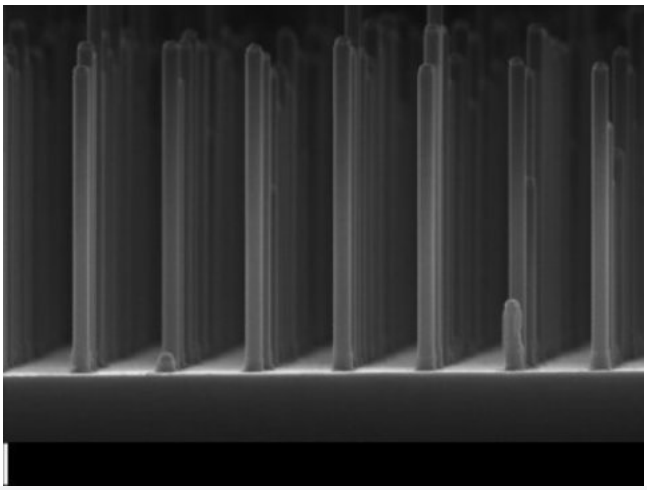
To connect an existing silicon solar cell to a battery that splits the water may well be an efficient solution now but it is a very expensive one. Many researchers are therefore targeting their search at a semiconductor material that is able to both convert sunlight into an electrical charge and split the water, all in one; a kind of 'solar fuel cell'. Researchers at TU/e and FOM see their dream candidate in gallium phosphide (GaP), a compound of gallium and phosphide that also serves as the basis for specific colored leds.

A tenfold boost

GaP has good electrical properties but the drawback that it cannot easily absorb light when it is a large flat surface as used in GaP solar cells. The researchers have overcome this problem by making a grid of very small GaP nanowires, measuring five hundred nanometers (a millionth of a millimeter) long and ninety nanometers thick. This immediately boosted the yield of hydrogen by a factor of ten to 2.9 percent. A record for GaP cells, even though this is still some way off the fifteen percent achieved by silicon cells coupled to a battery.

Ten thousand times less material

According to Bakkers, it's not simply about the yield -- where there is still a lot of scope for improvement he points out: "For the nanowires we needed ten thousand less precious GaP material than in cells with a flat surface. That makes these kinds of cells potentially a great deal cheaper," Bakkers says. "In addition, GaP is also able to extract oxygen from the water -- so you then actually have a fuel cell in which you can temporarily store your solar energy. In short, for a solar fuels future we cannot ignore gallium phosphide any longer."



Array of nanowires gallium phosphide made with an electron microscope.
Credit: Eindhoven University of Technology

In 2014, the most essential indicators of Earth's changing climate continued to reflect trends of a warming planet, with several markers such as rising land and ocean temperature, sea levels and greenhouse gases — setting new records. These key findings and others can be found in the State of the Climate in 2014 report released online by the American Meteorological Society (AMS).

The report, compiled by NOAA's Center for Weather and Climate at the National Centers for Environmental Information is based on contributions from 413 scientists from 58 countries around the world. It provides a detailed update on global climate indicators, notable weather events, and other data collected by environmental monitoring stations and instruments located on land, water, ice, and in space.

SCIENCE NEWS

"This report represents data from around the globe, from hundreds of scientists and gives us a picture of what happened in 2014. The variety of indicators shows us how our climate is changing, not just in temperature but from the depths of the oceans to the outer atmosphere," said Thomas R. Karl, L.H.D, Director, NOAA National Centers for Environmental Information.

The report's climate indicators show patterns, changes and trends of the global climate system. Examples of the indicators include various types of greenhouse gases; temperatures throughout the atmosphere, ocean, and land; cloud cover; sea level; ocean salinity; sea ice extent; and snow cover. The indicators often reflect many thousands of measurements from multiple independent datasets.

"This is the 25th report in this important annual series, as well as the 20threport that has been produced for publication in BAMS," said Keith Seitter, AMS Executive Director. "Over the years we have seen clearly the value of careful and consistent monitoring of our climate which allows us to document real changes occurring in the Earth's climate system."

Key highlights from the report include:

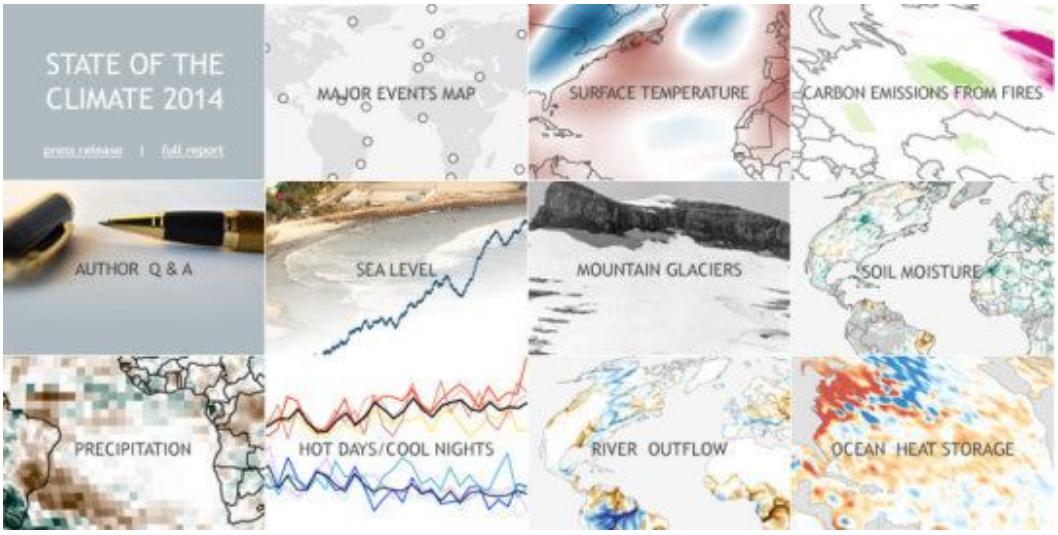
- **Greenhouse gases continued to climb:** Major greenhouse gas concentrations, including carbon dioxide, methane and nitrous oxide, continued to rise during 2014, once again reaching historic high values. Atmospheric CO_2 concentrations increased by 1.9 ppm in 2014, reaching a global average of 397.2 ppm for the year. This compares with a global average of 354.0 in 1990 when this report was first published just 25 years ago.
- **Record temperatures observed near the Earth's surface:** Four independent global datasets showed that 2014 was the warmest year on record. The warmth was widespread across land areas. Europe experienced its warmest year on record, with more than 20 countries exceeding their previous records. Africa had above-average temperatures across most of the continent throughout 2014, Australia saw its third warmest year on record, Mexico had its warmest year on record, and Argentina and Uruguay each had their second warmest year on record. Eastern North America was the only major region to experience below-average annual temperatures.
- **Tropical Pacific Ocean moves towards El Niño-Southern Oscillation conditions**: The El Niño-Southern Oscillation was in a neutral state during 2014, although it was on the cool side of neutral at the beginning of the year and

approached warm El Niño conditions by the end of the year. This pattern played a major role in several regional climate outcomes.

- **Sea surface temperatures were record high:** The globally averaged sea surface temperature was the highest on record. The warmth was particularly notable in the North Pacific Ocean, where temperatures are in part likely driven by a transition of the Pacific decadal oscillation -- a recurring pattern of ocean-atmosphere climate variability centered in the region.
- **Global upper ocean heat content was record high**: Globally, upper ocean heat content reached a record high for the year, reflecting the continuing accumulation of thermal energy in the upper layer of the oceans. Oceans absorb over 90 percent of Earth's excess heat from greenhouse gas forcing.
- **Global sea level was record high:** Global average sea level rose to a record high in 2014. This keeps pace with the 3.2 ± 0.4 mm per year trend in sea level growth observed over the past two decades.
- **The Arctic continued to warm; sea ice extent remained low:** The Arctic experienced its fourth warmest year since records began in the early 20th century. Arctic snow melt occurred 20-30 days earlier than the 1998-2010 average. On the North Slope of Alaska, record high temperatures at 20-meter depth were measured at four of five permafrost observatories. The Arctic minimum sea ice extent reached 1.94 million square miles on September 17, the sixth lowest since satellite observations began in 1979. The eight lowest minimum sea ice extents during this period have occurred in the last eight years.
- **The Antarctic showed highly variable temperature patterns; sea ice extent reached record high:** Temperature patterns across the Antarctic showed strong seasonal and regional patterns of warmer-than-normal and cooler-than-normal conditions, resulting in near-average conditions for the year for the continent as a whole. The Antarctic maximum sea ice extent reached a record high of 7.78 million square miles on September 20. This is 220,000 square miles more than the previous record of 7.56 million square miles that occurred in 2013. This was the third consecutive year of record maximum sea ice extent.
- **Tropical cyclones above average overall:** There were 91 tropical cyclones in 2014, well above the 1981-2010 average of 82 storms. The 22 named storms in the Eastern/Central Pacific were the most to occur in the basin since 1992. Similar to 2013, the North Atlantic season was quieter than most years of the last two decades with respect to the number of storms.

SCIENCE NEWS

The *State of the Climate in 2014* is the 25th edition in a peer-reviewed series published annually as a special supplement to the *Bulletin of the American Meteorological Society*.



For State of the Climate in 2014 maps, images and highlights, *Credit: NOAA*

In the latest data from NASA's New Horizons spacecraft, a new close-up image of Pluto reveals a vast, craterless plain that appears to be no more than 100 million years old, and is possibly still being shaped by geologic processes. This frozen region is north of Pluto's icy mountains, in the center-left of the heart feature, informally named "Tombaugh Regio" (Tombaugh Region) after Clyde Tombaugh, who discovered Pluto in 1930."This terrain is not easy to explain," said Jeff Moore, leader of the New Horizons Geology, Geophysics and Imaging Team (GGI) at NASA's Ames Research Center in Moffett Field, California. "The discovery of vast, craterless, very young plains on Pluto exceeds all pre-flyby expectations."

This fascinating icy plains region -- resembling frozen mud cracks on Earth -- has been informally named "Sputnik Planum" (Sputnik Plain) after the Earth's first artificial satellite. It has a broken surface of irregularly-shaped segments, roughly 12 miles (20 kilometers) across, bordered by what appear to be shallow troughs. Some of these troughs have darker material within them, while others are traced by clumps of hills that appear to rise above the surrounding terrain. Elsewhere, the surface appears to be etched by fields of small pits that may have formed by a process called sublimation, in

which ice turns directly from solid to gas, just as dry ice does on Earth.Scientists have two working theories as to how these segments were formed. The irregular shapes may be the result of the contraction of surface materials, similar to what happens when mud dries. Alternatively, they may be a product of convection, similar to wax rising in a lava lamp. On Pluto, convection would occur within a surface layer of frozen carbon monoxide, methane and nitrogen, driven by the scant warmth of Pluto's interior.Pluto's icy plains also display dark streaks that are a few miles long. These streaks appear to be aligned in the same direction and may have been produced by winds blowing across the frozen surface.

The Tuesday "heart of the heart" image was taken when New Horizons was 48,000 miles (77,000 kilometers) from Pluto, and shows features as small as one-half mile (1 kilometer) across. Mission scientists will learn more about these mysterious terrains from higher-resolution and stereo images that New Horizons will pull from its digital recorders and send back to Earth during the next year.The New Horizons Atmospheres team observed Pluto's atmosphere as far as 1,000 miles (1,600 kilometers) above the surface, demonstrating that Pluto's nitrogen-rich atmosphere is quite extended. This is the first observation of Pluto's atmosphere at altitudes higher than 170 miles above the surface (270 kilometers).The New Horizons Particles and Plasma team has discovered a region of cold, dense ionized gas tens of thousands of miles beyond Pluto -- the planet's atmosphere being stripped away by the solar wind and lost to space."This is just a first tantalizing look at Pluto's plasma environment," said New Horizons co-investigator Fran Bagenal, University of Colorado, Boulder.

"With the flyby in the rearview mirror, a decade-long journey to Pluto is over --but, the science payoff is only beginning," said Jim Green, director of Planetary Science at NASA Headquarters in Washington. "Data from New Horizons will continue to fuel discovery for years to come."Alan Stern, New Horizons principal investigator from the Southwest Research Institute (SwRI), Boulder, Colorado, added, "We've only scratched the surface of our Pluto exploration, but it already seems clear to me that in the initial reconnaissance of the solar system, the best was saved for last."

New Horizons is part of NASA's New Frontiers Program, managed by the agency's Marshall Space Flight Center in Huntsville, Alabama. The Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland, designed, built and operates the New Horizons spacecraft and manages the mission for NASA's Science Mission Directorate. SwRI leads the mission, science team, payload operations and encounter science planning.

- Credit: Science daily

Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Study on Collection of Compensation for Delayed Repayment of Bank Claims from the Viewpoints of Law and Religious Jurisprudence

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Received: 23 Mar 2015 Revised: 15 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

Compensation for delayed repayment of bank loans has been a controversial issue after the victory of Islamic Revolution. It is not only an important issue in our applicable laws but also a considerable subject in religious jurisprudence. Reaching a definite conclusion calls for investigation of the issue. Finding a solution to this problem would help resolve many economic challenges in Islamic banking and remove the religious doubts and ambiguities. In this connection, there has been a long dispute between Islamic Consultative Assembly and the Guardian Council concerning whether delayed payment compensation is lawful, which has not been fully resolved yet. The findings of such studies can be used in economic pathologies and in eliminating the obstacles to economic growth. All disputes in this connection stem from whether or not such compensation is usurious. If usurious, it would definitely be an unlawful act and means war against God and the Prophet. To find a solution, however, we need to explain old and new types of money and investigate the differences between them.

Keywords: Compensation, Guardian Council, Consultative Assembly.

INTRODUCTION

One of the important issues in religious jurisprudence and in law, even in international law, is that if one undertakes to do something but fails to do it in the agreed date, he or she shall compensate all losses that might have been inflicted on the other party as the result of such delay. If the subject of obligation is delivery of goods, provision of services or payment of uncommon cash (foreign currency for example), it is called “non-performance compensation”

or "delayed performance compensation". If the subject of obligation is current cash, legislator uses the term of "compensation for delayed repayment of bank claims". This has drawn much attention due to transformations in religious jurisprudence and in law, giving rise to different reactions from legal and religious authorities. On the one hand, it would be very difficult to maintain economic order without applying delayed payment compensation. On the other hand, the possibility of unlawfulness of such compensation and the necessity of conformity between law and religious jurisprudence (according to article 4 of the Constitution of the Islamic Republic of Iran) has given rise to many problems in this regard. After the Islamic Revolution, there has been much dispute between legal and religious authorities concerning payment of this compensation. The dispute went so far that the Guardian Council declared in 1983 that delayed payment compensation is inconsistent with religious jurisprudence. This decision gave rise to many problems, especially for banks, as the result of which legislator stipulated the legality of delayed payment compensation by laying down note 2 under article 515 of Civil Procedure Act, 2000. An example of this article is article 522 of the same Act. In practice, however, this article caused many problems for the Judiciary and for creditors. Although some books and papers have dealt with this issue, none has provided a specialized investigation. Finding a rational solution to this issue would resolve the challenges facing the Judiciary and all associated people. In this paper we attempt to demonstrate that when there is neither a specific rule nor an agreement, due date should be given the priority. This protects the rights of people, which is the main purpose of justice and is the philosophy of law.

Basic concepts

Here, we take a look at basic definitions in law and in religious jurisprudence. Usury literally means excess. Raqeb Esfahani defines it as capital increase, not just increase (Raqeb Esfahani, Almofradat Fi Qarib-ul-Quran, 187). Ibn Manzour defines it as "a surplus to the principal property which has not been obtained from sale and purchase." (Ibn Manzour, Lesan-ul-Arab, 14, 305). Sahib Jawahir defines it as "sale of two things which are legally the same, with one being more than the other, or lending a thing on the conditions of an additional thing" (Najafi, 1988, 23, 334). Quran points to usury in Chapters "Rome, 39", "Nesa, 161", "Al-e Omran, 130", "Baqara, 275, 276, 278, 279 and 280". There are also many hadiths in this connection. For example, Imam Sadiq says: "درهم ربا اشد من سبعين زنيه كلها بذات محرم" (حر عاملی، وسائل الشیعه الی تحصیل مسائل الشریعه, 18, 117).

Money

There are four definitions of money in economic literature: legal definition, definition in terms of examples, definition in terms of duties, and definition in terms of general acceptability for exchange (Mir Jalili & Nazari, Money in Islamic Economy, 324-325). Definition of money in terms of its nature can explain the real meaning of money. According to a definition, "money is anything which the public has recognized as a medium of payment (Flemington & Coleman 1995, 7). From legal viewpoint, money has three functions: 1) money is a means of determining value and credit; 2) money is a means of payment; and 3) money is the best medium which can be kept in its form (Moulin 1992, p.16). Today's money has passed many steps to reach its current position (Qadiri Asli, Generalities of Economics, 191-192; Qadiri Asli, Money, 6-8). A major difference between today's money and its past counterparts lies in distinct types of backing.

Value of Money

Every property which is perceived by one of the five senses is material property, as opposed to non-material property (Jafari Langeroudi, Terminology of Law, 4, 3141). There is no general consensus about whether money is a material or non-material property. Some believe that banknote is not a document and is a material property because it can be perceived by one of the senses. Some jurists maintain that "money is a material movable object, whether it is precious (e.g. silver and gold coins) or is not precious (such as banknote)" (Jafari Langeroudi, Dictionary Elements, 170).

Purchase Power

Some believe that money is not a material property (Motahari, A Look at Economic System, 69; Sadr-ul-Eslam Yaqud-ul-Hayat, 224-225; Yousefi, Today's Money: Replaceable or Irreplaceable 113-114). They argue that banknote (money) merely represents purchase power. According to a famous opinion in religious jurisprudence, money (such as gold and silver coins) is a replaceable property, so decrease or increase of purchase power or value of money does not have any effect on the liability of debtor. Therefore, debtor shall not pay more than the original money if money value decreases, nor shall debtor pay less than the original money if money value increases. For example, if A borrows 100 Toman from B in 1977 and pays 100 Toman to B in 2010, A has fulfilled his liability. Among those who have this belief are Ayatollah Tabatabaei Yazdi (1997, 279), Imam Khomeini (2001, 2, 291), Ayatollah Khoei, (1992, 3, 153); Ayatollah Fazil Lankarani (1995, 322) and Dr. Katozian (2008, 4, 42-46). Shahid Sadr conceives of money as a replaceable property, which was followed by similar opinions regarding money (Sadr-ul-Islam Yaqud-al-hayat, 224-225). If replaceability of money lies in purchase power, borrower assumes the responsibility in time of borrowing. When the property is irreplaceable, likewise, borrower undertakes to pay back the price applicable to the time of borrowing, not to the time of repayment. Therefore, money is not a replaceable property (Davoodi et al., Money in Islamic Economy, 79-80). Shahid Sadr conceives of purchase power as the whole nature of money. He argues that purchase power is the exchange value of a property. In other words, money and property are the same and there is no distinction between them (Tavasoli, Investigation and Criticism of Opinions, 131).

REVIEW OF BANKING IN IRAN

Bank transactions dates back to a long time ago. Such transactions, it their primitive form, were prevalent at the time of Babylonian empire. Even the Inscription of Hammurabi Laws contains some regulations regarding loading and interest rate. At medieval time, banking stepped into a new step. However, such activities faced the strong opposition from church authorities and conditional prohibition in the Jewish religion. In Iran, Sepah Bank was founded in 1925 as the first Iranian bank. This bank was financed by Army Retirement Fund. In 1928, Bank Melli Iran was founded and then other banks came into existence. Since the major activity of banks was to attract deposits and grant loan to customer, some of the loans remained unpaid due to non-payment in due date. There was no comprehensive law on the collection of such claims and the penalty of such delays. In 2002, the amount of delayed payment compensation was provided for in Civil Procedure Act. Pursuant to this Act, banks were entitled to collect claims and delay penalty from customers.

Before the Islamic Revolution

Before the Islamic revolution, most Iranian banks were private. Every year, however, The Council of Money and Credit determined and announced the rate of interest for deposits and loans. Bank loans were mostly in the form of current account credit, industrial loans, and other types of loans. With the exception of Housing Sector, interest rate of loans was between 8-10%. Where customers failed to repay loans in due date, they had to pay 12% as delay penalty on the strength of articles 712-723 of Civil Procedure Act. This compensation applied to the entire debt, both principal and interest. Moreover, if the bank sued the debtor and the latter was found guilty, debtor had to pay all trial costs and attorney's fee. As the result, customers always tried to repay their loans on due date in order to avoid such compensations. Thanks to guarantees, therefore, almost all loans were paid by due date.

According to Article 228 of the Civil Code:

"If the object of an agreement consists of the payment of a sum in cash, the judge can, subject to article 221, convict the debtor to pay compensation for losses incurred through delay in the payment of his debt."

While this Article recognizes the receipt of interest for delayed payment of bank claims, it provides that issuance of order in this connection is subject to article 221 of the Civil Code as follows:

"If any party undertakes to perform or to abstain from any act, he is responsible to pay compensation to the other party in the event of his not carrying out his undertaking provided the compensation for such losses is specified in the contract or is understood in the contract according to customary law or provided such compensation is by law regarded as guaranteed."

It seems that the reason why article 228 deems article 221 as a requisite to the receipt of compensation for delayed payment of bank claims is that the said compensation is some kind of contractual compensation and, pursuant to the Civil Code, contractual compensation is not receivable unless an explicit or implied condition regarding delayed payment compensation has been stipulated in the contract.

Article 34 of Registration Act, ratified on Mar. 16, 1932 points to "delayed payment compensation". Some part of the article provides that:

"Upon request of creditor, notary public shall issue an execution writ for collection of claims and for delayed payment compensation."

Also, article 36 of executive bylaw of Registration Act stipulates the receipt of 12% compensation for delayed payment of bank loans, which shall be collected by registration department and given to creditor.

In articles 719-723 of Civil Procedure Act, ratified in 1939, compensation for delayed payment of bank loans has been stipulated. Article 719 provides that:

"If the subject of an agreement is payment of a sum in cash, it shall be permissible to receive 12% as compensation for delayed payment of bank loan. If an agreement has been made under title of collateral, rental and the like in additional to the said compensation, compensation shall never exceed 12% per year. Where the amount of compensation has been fixed at less than 12%, the agreed amount shall apply."

After the Islamic Revolution

To encourage customers to pay their debts, the Superior Council of Banks empowered the Board of Directors of all banks through Circular No. 263 dated Dec. 11, 1980 to avoid collecting all or part of former interests and fees in cases where a claim was likely to be lost. The Council also allowed the banks to collect the debts on installments with lower interest rate and 4% fee in necessary cases. Subsequently, for more encouragement of customers to repay their loans, the Council announced that the said Circular also included the collection of interest for delayed payment of bank claims (Superior Council of Banks, Circular 216 dated Feb. 13, 1983). Despite the good opportunity provided to customers, reduction of interest from 10% to 4%, collection of debts on installments, and omission of interest for delayed repayment, unfortunately a large number of customers refrained from payment of their debts and bank claims remained uncollected.

After the Islamic Revolution, the legal system of collecting interest for delayed repayment of bank loans had two steps:

In the first step, which lasted until 1997, the Guardian Council declared that the collection of interest for delayed payment of bank loans was unlawful and illegal. After the Islamic Revolution, there was a disagreement about

whether the collection of interest for delayed payment of bank loans was lawful. By invoking the statement of Imam Khomeini who explicitly said "receipt of compensation for delayed payment of debt is unlawful", the Guardian Council declared it to be inconsistent with Islamic rules through a declaration in 1983. Therefore, courts of law were forbidden to order collection of compensation for delayed payment of bank loans. However, some administrative centers and banks sought a way to collect additional sums from violating debtors. Due to insistence of registration departments on execution of such plan, the Guardian Council made another declaration in 1988. According to this declaration, because some registration authorities were still doubtful about collection of compensation for delayed payment of bank claims, "that part of article 34 of Registration Act and notes 4 and 5 thereof and article 36 and 37 of registration executive bylaw, which has permitted the collection of additional sum from debtors as delayed payment compensation, is inconsistent with religious jurisprudence and therefore is unlawful. In all of these declarations, collection of compensation for delayed payment of bank loans has been deemed to be usury, which is unlawful according to religious jurisprudence. For a certain period after the Islamic Revolution, therefore, collection of compensation for delayed payment of bank loans was declared unlawful. Later, however, the Expediency Council, by appending a note to article 2 of the Act for Amending some Instances of Check Issuance Law dated May 31, 1997, enabled check holders to apply from courts for the collection of compensation for all losses incurred.

Also, in a declaration dated Dec. 12, 1998, the Expediency Council declared the collection of interest for delayed payment of loans to be an example of "the entire compensation", whereby taking a legal approach to the issue of collecting compensation for delayed payment of bank claims. This is the beginning of the second step. The basis for calculating compensation was the inflation rate announced by the Central Bank. After the Islamic Revolution, collection of compensation for delayed payment of bank loans was based on agreement and meant reduction of money value. This was unlike the judiciary system before the Islamic Revolution in which compensation was not based on inflation rate, but some percentage (12%) of the principal used to be collected as compensation, which is now deemed as usury.

In 1999, Law Department of the Judiciary announced that collection of compensation for delayed repayment of bank loans is legal and lawful provided it has been stipulated in mutual agreement. In 2000, legislator accepted the collection of compensation for all agreements with the subject of money. According to article 522, passed by the Guardian Council on Apr. 16, 2000, "In agreements which the subject of money, in which the debtor has failed to repay his/her debt while he/she is able to do it, in the case of significant change in annual price from due date until the date of payment and upon request of creditor, the court determines a compensation based on the change of annual price as announced by Central Bank of the Islamic Republic of Iran, unless the parties have agreed otherwise."

Review of legal and religious viewpoints regarding collection of compensation for delayed repayment of bank loans

Collection of compensation for delayed repayment of bank claims is in fact a compensation for deprivation of creditor from the benefits which he/she would have enjoyed if the debtor had paid it on due date. In cases where money is borrowed, not only the value of money may decrease but also the creditor is deprived of the benefits of using the money due to delay in repayment of debt. This compensation is in fact the lack of enjoyment. In religious jurisprudence, the lack of enjoyment cannot be collected (Najafi, Javaherkalam, 37, 38-39; Qomi, Jame-al-shatat, 2, 122; Sheikh Ansari, Makaseb, 3, 217). The aim of compensation, therefore, is to preserve the real value. Delayed payment compensation preserves the real value of a property but does not change credit value of money. Reduction of money value is not guaranteed, because the reduction and increase of value manifests in external property not in money itself. Value of the money depends on its credit (Khoei, Tozih-ul-Masael, 2843). Therefore, money does not have an actual value.

It seems that reduction or increase of money value does not depend only on credit. The change of money value, like the value of any other property, depends on supply and demand and increase of inflation has a significant effect on purchase power (Yousefi, Usury and Inflation, 154-155; Abdollahi, Fundamentals of Islamic Economy, 292-293). Ayatollah Bojnordi conceives of banknote as a countable object and rejects the issue of usury (Ebrahimi, Usury and Loan in Islam, 221). In replying to the question of "Is inclusion of inflation rate in debts and claims deemed as usury?", Ayatollah Makaram Shirazi states: "if inflation is recognized in custom, it is not usury, but any additional interest is usury. With respect to marriage portion, where there is a significant difference, inflation shall be calculated or, at least, parties shall reach a mutual agreement." (Alyan Nejadi, Esteftaat Jadid, 1, 161).

By reviewing the positive and negative opinions regarding collection of compensation for delayed repayment of bank claims, we can conclude that all agree that the losses inflicted on creditor must be compensated. The disagreement between them lies in the concept of delayed payment compensation and in whether such compensation is an example of loss. Religious jurists of Imamia branch believe that this compensation is the lack of interest and the receipt of compensation for delayed repayment of bank claims is not a loss, so it does not need compensation. Therefore, they believe it is unlawful to collect any sum in this connection. Considering the opinion of Mohaqiq Naeini that interest and loss is up to custom and the lack of interest is considered a loss (Khansari, 3, 378), we can regard the opinion of Imamia jurists as the lack of interest, which custom does not consider as loss.

Some jurists believe that the nature of compensation for delayed payment of bank loans lies in the loss that the creditor has suffered. This group invokes credit value of banknote whose nature is purchase power and the ability to meet the needs. For example, if A owes 10,000,000 Rials to B and purchase power remains constant, A shall repay the same amount on due date. But if that amount cannot represents the same purchase power in the time of payment, that amount is not sufficient for the fulfillment of obligation. To demonstrate their opinion, they invoke the religious rule of "Itlaf".

However, the nature of compensation for delayed repayment of bank loans fully differs from the above said instances. Most of religious jurists believe that such compensation is not usury. In fact, the existential reason of this compensation is the violation of a debtor who shall compensate the losses inflicted on the creditor. Therefore, this compensation is not an additional sum, but is a separate obligation of debtor. This solution allows for compensation of losses inflicted on creditor without being inconsistent with religious rules. It is also consistent with the laws and obligates the debtor to fulfill his/her obligation. Therefore, we conclude that compensation for reduction of money value does not apply to the definition of usury, yet it is necessary for the fulfillment of obligation.

The rate of compensation for delayed repayment of bank loans and economic variables

One of the important subjects of economics is the effect of interest rate for delayed repayment of bank loans on investment demands. Classic and neoclassic economists believe that investment is a reversed function of interest rate. The lower the interest rate, the less investment cost and the more investment increases (Tafazoli, 1987, p.258-262). On the other hand, Kinz maintains that investment is not only a function of interest, because if investors predict that they will gain a lot of profit, they are likely to obtain loan and make investment even with a high interest rate. But if they predict that they would not gain a good profit, they are likely to avoid investing even with very low interest rates. For this reason, he says that there is a relationship between investment and profitability predictions (Golriz & Majedi: pp. 208-209). If an enterprise manages to transfer the changes in interest rate, which are reflected on enterprise cost function, to consumers through increasing product price and increases its profit, interest rate increase will not have any impact on investment. But if economic situation does not allow for doing so and increase of interest and cost results in reduction of profit, investment declines. Therefore, when economic situation is good, investment rises despite high interest rates. In the time of recession, by contrast, investment declines despite low interest rates. in late 70s in US, for example, high interest rates, which had reached the highest level in the history of US, did not have a

considerable impact on investment (Toutonchian, 1996: p. 372-373). In Iran, despite the interest rate remained constant during 1963-1980 and was lower than inflation rate, banking system has experienced considerable additional resources (Komeyjani, 1994: p.24).

We reviewed religious and legal fundamentals regarding collection of compensation for delayed repayment of bank claims and investigated the effects of changes in interest rate for delayed repayment of bank loans on fundamental variables such as bank deposits, investment and inflation. We also found that these effects may be positive or negative. The question to consider here is: how can we find a balanced rate of compensation for delayed repayment of bank claims to be lawful in terms of religious rules and have positive economic effects on the level of deposits, investment and inflation?"

CONCLUSION

Collection of compensation for delayed repayment of bank loans is an important commercial issue which has faced many challenges in religious terms. The history of law in our country has experienced different steps before and after the Islamic Revolution. Before the Islamic Revolution, the maximum collectable compensation was 12% without the need to prove infliction of loss. After the Islamic Revolution, the Guardian Council declared such compensation to be unlawful. With respect to banks, however, the Guardian Council accepted such compensation provided it is stipulated in the main contract. Declaration of the Guardian Council is not limited to banks; anybody can use this solution provided that the aim of this stipulation is to obligate the debtor to pay his/her debt on due date, not to gain profit in return for extension of deadline. In cases which concern payment of a sum in cash, justice is not done unless inflation rate is considered in determination of debt. For the sake of justice, inflation rate must be calculated from due date. Calculation of inflation rate from collection date, even one day after due date, would result in an inequality between the subject of obligation and what must be paid to creditor. It seems that the second "collection" in article 522 of civil procedure act means an option granted by legislator to creditor to collect or to not collect the compensation, but not to calculate the compensation from date of collection, because the court cannot order beyond the demand of creditor. Besides, it is not rational to deprive the creditor of his obvious right.

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Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

The Necessity of Developing an Energy Strategic Plan for Sustainable Development Path; Case Study of Iran's Energy Sector

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Received: 26 Mar 2015 Revised: 23 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

In the definition of sustainable development, use of limited and exhaustible energy resources is of particular sensitivity. In fact, growth and economic development requires the use of energy while these resources could not meet the growing demand of the country. Since energy is the most important topic of sustainable development and assessment of its indicators reflect the country's situation in terms of sustainability. Survey indicators of various aspects of economic, social and environmental issues could give a good image for the policy makers and planners that on the path to achieving the goals of sustainable development what requirements is needed. In this article, some of the indicators of sustainable development in the energy sector of country are investigated. Evaluation of these indicators, particularly in view of the growing trend of energy consumption and increase the social and environmental pollutants specially following many Social and environmental damage which represents the distance of the country from the path of achieving the goals of sustainable development. Hence the necessity of strategic plans and strategic plans in the energy sector and its enforcement in the country is very important and necessary.

Key words: Energy Strategic Plan, sustainable development of the energy sector, Energy Indicators for Sustainable Development

INTRODUCTION

Today, Sustainable development is one of the largest and perhaps the most important challenge facing humanity in the present century. According to the first statement, "Rio" humanity is at the center of risks and concerns for sustainable development. Use of sustainable development indicators in the formulation of national development documents according to the specific characteristics of each region, in fact, enjoying a world of ideas at a local level that the main path of sustainable development is based on this principle. Sustainable development in the energy sector suggests the organizing activities of the energy sector in a way that supply human development in the short term, medium term and long term in all different aspects. Energy sector includes all activities that the exploration, extraction, production, transportation, consumption, imports and export process is done. Lack of energy efficiency in production, distribution and consumption, as well as limitations in resources, investment, management and technology are the major cause of lack of access to sustainable energy in the present communities.

Obviously, Evaluate the performance of each country on the path of sustainable development requires the definition of criteria that can be applied to a single method. Among these, assessment of sustainable development in the energy sector requires the definition of indicators which encompasses all the important features in the energy sector and examines the state of the sector in terms of sustainability. Energy is one of the most important issues for sustainable development at the Rio conference in 1992. On the one hand the demand for energy in line with the socio-economic development of countries increase and on the other hand is an appropriate and sufficient condition to service the energy sector in the way this department can cope with costs such as environmental damage and adapt to meet the needs of economic and social development which is an essential component of sustainable development. Although sustainable development objectives are too broad and general but in order to measure and monitor these goals, indicators of sustainable development should be numerical.Therefore, indicators of sustainable development in the energy sector, like other sectors identified and measured.Given the importance of the issue and check the status of the country's energy sector in terms of sustainability, in this paper, some important indicators of sustainable development in the energy sector of the country are analyzed. Certainly, evaluation of these indicators and the gap of country's energy sector from sustainable development goals can gain the focus of Policy makers and planners on the requirements of sustainability and enforcement policy in this sector

Sustainable Development

The traditional concept of development which revolves around economic growth before the 1970s was the dominant concept in the world. Based on this concept, development was thought to be a process in which different communities with backwardness and underdevelopment conditions through more or less the same developmental stages and bear the quantitative and qualitative changes become developed societies. This ideological conception of development in the light of the very and various criticisms in the 1970s and especially in the 1980s failed and a major cause of it was as a result of injuries and irreparable damage to the nature due to the indiscriminate use of industrialized countries for economic growth and development over nature. The failure of development projects in third world countries, a few decades after the start of international efforts to develop was a definition that focused the minds of scholars and researchers in the 1980s. In fact, in the shadow of a doubt of the concept of development and underdevelopment, a new concept was created which was certainly bad development. This concept was concluded through viewing bitter realities and undesirable experience in the past and accepted the greatest impact from the broad social movements and intellectual developments. An environmental issue is also among the movement of the late twentieth century which in thought and action had a deep and wide effects in the world. It had wide dimensions on the social issue and has largely left the greatest impact on development concepts. Despite hopes was tied with it in the past decade, development was a process that except increasing poverty and inequalities did not any result for the third world countries and sustainability was the only missing link in the development and social , environmental movement , so sustainable development was the only solution for simultaneous interaction of

these dimensions.According Brtlnd report, Sustainable development is the development that meets the needs of today's world in the way that the ability of future generations to meet their requirements is not at risk. The concept of need in this definition is the basic needs of people, especially poor people in the world. World commission on environment and development defines it in this way" "Sustainable development is a process of change in the use of resources, directing investment towards the development of technology and institutional change that is in harmony with the present and future needs. Based on this, saving in resources is scarce and policy in using resources should be considered. Therefore, development was defined as a multi-dimensional development with particular attention to sustainability. Since sustainable development includes not only economic and social activities that the usage of resources, particularly its impact on the environment is considered. This line of thought in Brtlnd report in 1987 was proposed as a central issue in the world and continued with the United Nations Conference on Environment and Development and symposium, The Hague, the Netherlands .After the Earth Summit in Rio in 1992, this current of thought has finally arrived and from then, Sustainable Development was become as one of the most fundamental aspects of the public interest. Sustainable development in the late twentieth century as one of the central world debates has influenced almost all areas of human life such as poverty, inequality, education, health, environment, women's and children's rights, freedom of nations and industry, politics, the economy and international cooperation and has been proposed in the modern era as a new range with the claim that address issues that fall in danger human life cycle and the nature and human type.This dynamic range was expanded and deepened due to diverse areas after the Earth Summit and its decisions especially continue agenda 21 in various branches. Now, this area has been emphasized as the most basic vital debate of twenty-first century in many international researches and then there will not be development without stability and sustainability without development. Thus, sustainable development based on three main components, economic growth, social justice and environmental protection. Thus, providing social justice in society and between generations, providing minimum living conditions, prosperity, democracy, freedom, culture diversity, health and education is the necessities of sustainable development. Mechanisms for achieving sustainable development cannot be the same for all societies and cultures. Therefore, sustainable and appropriate development should be considered.

Sustainable development indicators

For many years, the only way for measuring the level of economic, social and human development was economic variables such as national income, per capita income and other macroeconomic variables. With the introduction of sustainable development and examining past experiences, they ensured that countries with higher per capita income will not reach prosperity. These indicators, in terms of analysis also had many problems which are described in detail in the books of macroeconomics. The main use of sustainable development indicators is supporting and modification of policies and decision-making at different levels.Most indicators have been developed for use at the national level. Differences between different countries (such as size, level of industrialization, etc.) as well as the existing disparity between countries is often extremely broad and deep and cause serious problems in the application of the same indicators at the national level in all countries (for example, what is the meaning of air quality at the level of a country?). For this reason, many experts and politicians strongly encourage the development of sub-national level indicators. If aomparative assessment is desirable in the international level but this comparison is very difficult due to differences in environmental conditions and social institutions. The main focus is on the efforts to find a set of indicators that can be used at the international level. Some of these indicators are more important in some countries than others. Also, in many cases, they require a number of additional indicators that are not appropriate to world comparison. The aim is not making indicators that cover everything but the goal is to determine what is the most appropriate and important.

One of the most important concerns of planners, policy makers and researchers is the use of criteria and standards based on the quality characteristics of different countries in the areas of economic, social, environmental and other areas is introduced and also by clarifying the analysis could draw the state of the country appropriately. The

importance of formulation indicators and considering their state especially after developing sustainable development concepts and formulation of sustainable development indicators and considering the state of countries was focused. For this reason, in the fortieth chapter of Agenda 21, the formulation and development of sustainable development indicators and use them to measure the trend towards developing countries was stressed. While experts on the environment and ecology stress on the physical and biological indicators and use them for stability testing. However, the common denominator of all these methods is to create sensitivity in public opinion and policy makers to make the balance between various aspects of sustainable development. Today, sustainable development indicators in various dimensions are categorized to 4 main and 58 sub-branches.

Energy and sustainable development

According to the above statements, sustainable development cannot be considered a new concept along with other economic activities, but also the concept of a balanced development in all parts of the country. Thus sustainable development can be seen as an attitude and Inter-sectoral approach and even Cross-sectoral approach that its realization is possible with the cooperation of all sectors of society and people at local, regional, national and international [4].Use of limited and exhaustible resources has a particular sensitivity due to the concept of sustainable development as the process which will brings the various needs of the present generation without compromising the needs of future generations for this because the most important energy topics raised in the form of sustainable development. That's why the energy topic is the most important raised topics in the sustainable development system.The energy sector includes all activities in the energy value chain, including exploration, extraction, production, transmission, distribution and consumption, exports and imports. Based on this development of the energy sector, organizing activities of energy sector is in such a way that has the least destructive effects to the environment. A very simple and obvious reason is the existence of global environmental problems. Problems such as global climate changes, loss or destruction of the stratospheric ozone layer, cross-border transfer of hazardous waste, endangered species, in general, and in particular instability in the energy sector. The instability is to the extent that energy along economy and environment has turned into the center of the concerns and international attention. There is no doubt that the demand for energy rises along with economic and social development of countries, so countries are on track to increase the use of energy sources which these resources are faced with limitation in nature. Also a sufficient condition for servicing in this section is that the department can afford the cost of environmental protection and compliance with the needs of socio-economic development that is a necessary component for sustainable development. Agenda 21 in the United Nations stressed these issues. In the ninth summit statement reads:

Indicators of energy sustainable development

The need for comprehensive and general indicators for the energy sector in a project called " indicators of energy sustainable development " was launched in 1999 by the International Energy Agency, based on the 16 main issue in relation to development sustainable energy in various aspects of sustainability were presented as follows:

Social dimension: energy gap in access to energy

Economic dimension: the different levels of economic activity, production, supply and consumption of energy, pricing, taxation and subsidies for energy, intensity of final consumption of energy- efficiency of energy supply, energy security

The environmental dimension: Changes in global climate - air pollution - water pollution - waste - lack of energy resources - land - risks and accidents – deforestation

Institution dimension: all of these concepts separately or together

List of sustainable development indicators has been shown in Table 1, that each of them is related to each other based on the relationship shown in Figure 1.

The position of Iran in the energy resources

Iran has more than 151 billion barrels of recoverable oil reserves and 33 trillion cubic meters of gas reserves, in terms of total hydrocarbon reserves has allocated a privileged place among the rest of the world. According to current trends, including oil and gas production, it is estimated that the country has had 109.86 oil and 146.86 natural gas until next year for production and exports. Despite Iran's position in the access to energy resources, the energy consumption in the country is worrying and the process can face country movement and energy sector along the path of sustainability with difficulties. So in this part, the overall energy resources situation in Iran and on the following, factors that threaten the sustainability of the energy sector will be studied.

Crude oil reserves and condensates in the country

The total recoverable reserves of crude oil and gas condensate of our country in the beginning of 1391 with the discovery of new sources, including 156/53 billion barrels compared to the 1389 has increased to the 1.95 billion barrels which is equivalent to of 1.3 percent . More than 80% of these reserves are located in the south west of the country that the amount of recoverable oil reserves of low and sometimes negative annual growth in the years 1389 to 1391. More than 80% of these reserves are located in the south west of the country which the amount of recoverable oil reserves had had low and sometimes negative annual growth during the years 1383-87 and it had followed significantly increasing trend in the years 1389 to 1391 with increasing exploration activities and also decreasing the level of production [5]. Life liquid hydrocarbon reserves are estimated about 127 years in 1391. Iran with this crude oil and conventional condensate reserves, after Venezuela, Saudi Arabia and Canada ranked fourth in the world and holds over 9% of the world's oil reserves. It should be noted that Iran has been in second place in recent years with the discovery of new oil reserves and unconventional reserves in the countries of Venezuela and Canada declined to the fourth place. Although Iran holds approximately 13% of the oil reserves of OPEC among the member countries and it ranked third after Venezuela and Saudi Arabia.

Life reserves means the completion time of recoverable oil and condensate reserves based on the previous year's production and Lack of exploration for new

Natural gas reserves

The total amount of recoverable natural gas reserves from 33.62 trillion cubic meters in 1389 with 170 billion cubic meters at the beginning of 1391 was increased to 33.79 trillion cubic meters. Therefore, Iran ranks second in the world after Russia with this amount of natural gas reserves. Of the total recoverable reserves of natural gas in Iran, 20.69 trillion cubic meters belongs to marine areas and 1.13 trillion cubic meters belongs to land area. The total recoverable reserves of natural gas in 1391 reached 33.8 trillion cubic meters. With the discovery of the Ravandi gas field, Oil Ministry in 1391 managed to add approximately 9.14 billion cubic meters to the first volume of reserves in the country. Also in this year, exploration activities in the two Saman and Sohrab field of oil / gas was organized that as a result of this operation, 2.28 billion cubic meters of natural gas reserves added to the first reserves in the country.

Coal reserves

Coal reserves in total have been estimated about 11 to 14 billion tones. In 1391, certain coal reserves in the country with 46 million tones increase over the previous year from 1.12 million tons reached to 1.17 million tones. This

increase was mainly due to the new exploration operations and reviewing the amount of reserves in the provinces of Mazandaran , Semnan, Kerman, Tehran, Golestan.

Petroleum products

Oil refineries of the country in 1391 with more than nominal capacity and with an average of the feed (crude oil and condensate) were produced 1800.87 thousand barrels per day compared to the previous year (1748.64 thousand barrels per day), and showed 2.98 percent increase.

Instability factors in the world energy sector

The most important factors of instability in the world energy sector is lack of access to electricity, so that the evaluation of the energy situation in 2013 shows that 20 percent of the worlds that form 20 percent of the population,, especially in developing countries, are still without access to electricity. Also according to the process of economic growth in the world, energy resources could not meet the growing demand of energy in the world. Based on this, there is an uncertain supply of energy and economic constraints in much of the world. Also, The state of the global environment and damage resulting from energy consumption, especially of fossil fuels has effects on the lives of communities.

Check the status of energy Sustainable development indicators in Iran

Iran's energy sector is important from two perspectives. First, it provides the fuel needed and without it, the engine of growth for the economy stops. Secondly, country currency income depends heavily on this sector. So stability is very important in this part and in various upstream documentation has been emphasized.

One of the requirements of country in order to achieve sustainable development is cutting dependence on oil and revenues from the sale of crude oil. However, although the purpose of the government in country was further decreases in dependence on the oil sector, but this does not mean that oil and gas production is reduced.so, it is not supposed that country's dependence on oil stopped completely because oil as engine of the economy plays an important role in the development of the country. Therefore, on the one hand its value added should be raised with optimal production and avoid selling crude oil, and on the other hand, it be considered important for promote national economic growth, efficient use and improve efficiency and productivity of energy resources through the consumption pattern. However, it was begin desirable move to alter the pattern of energy consumption in the country with the implementation of the first phase of targeted subsidies in the last quarter of 1389 but due to the continued application of the next phases law and Given the economic situation of the country was not recognized by the competent authorities in 1391 and It seems, the energy is returned to the condition before. Therefore take a look at the performance and evaluation of sustainable development indicators in this section represents the gap between current and desired status indicators, particularly in terms of energy consumption.In addition to the energy supply management, the part which is not very famous is demand energy management. Management of energy demand and attempt towards efficient use of energy in all the advanced countries of the world was the most important factors in sustainable industrial development. Development of general and specialized knowledge of efficient use of energy as well as Standardization energy applications in the various parts of the consumer was one of the most consumption control methods of energy carriers and the protection of national assets. On the other hand, sustainable development with the appropriate and optimal use of all available resources and planning and a long-term vision, with an emphasis on realistic action plans realized. A look at the statistics and information about the intensity of energy consumption in Iran and developed countries shows that inefficient use of energy in our country can be seen more than other countries that the main reasons for it is the low efficiency of energy conversion technologies, and incorrect culture of energy consumption.

Energy intensity

Table 4 shows the energy intensity compared to some countries in the 2012. According to what is shown in this table, developed countries such as the UK, Japan, Germany, France, Brazil and America, respectively, have the lowest energy intensity compared with the average of world's primary energy.in this year, Energy intensity in Iran is 0.55 Which is 2.3 times the world average that compared to the past year (equal to 0.47) increased And also in comparison with other regional countries such as Turkey (0.14) and Saudi Arabia (0.3) is a lot higher.As well as, if gross domestic product was considered as a purchasing power parity and although the situation in Iran in terms of energy intensity rank higher than Russia and Saudi Arabia but still its energy consumption intensity is higher seriously than Turkey, India and other developing countries is higher. In fact, in order to produce per thousand dollars of GDP based on purchasing power parity, about 0.15 tons of crude oil equivalents of energy consumed in 2012, while the figure for Iran is 0.24 which is about 1.5 of the global average.

Energy intensity changes in the final period 1381-91 shown in Figure 2. Based on statistics of Hydrocarbon balance sheet in 1391, the final energy consumption (Without petrochemical feed and Non-energy products) during 1381-91 from 718.38 million barrels of crude oil in 1381 with an average annual growth of % 4/15 to the 1081.64 million barrels of crude oil in 1391 increased.Final Energy consumption intensity from 2.01 barrel to the million rials (fixed price 76) in 1381 with an average annual growth of about %0/27 to the 2.07 barrel to the million rials in 1391 which compared to the previous year had %4/6 increased. This amount of increase in the intensity of final energy consumption has happened in the situation that in 1391 compared to the previous year -5.8 has been reported. The average annual growth in its energy consumption intensity in country during above period was 0.27 % which represents an increase of this indicator in the country.

Per capita consumption of energy

Country situation in terms of per capita energy consumption is not good. The population of about 65 million people in 1381 reached to 76 million in 1391 with growth of 1.47 percent. During this period, per capita consumption of final energy has a growth rate of 2.64 percent. Accordingly, per capita consumption of final energy from 10.94 barrel to people in 1381 reached to 14.23 barrel to people which the cause of it can be attributed to low energy efficiency. However, in 1389 and after law of targeted subsidies that was followed by increase in energy prices, a reduction in per capita energy consumption growth has happened, but then increased again occurred. Also comparing gross domestic product for every person and per capita consumption of final energy for every person draws an undesirable situation. This situation is shown in Figure 3. Accordingly, while in the period of 1381-91 , GDP per capita average has increased 2.7 percent, final consumption of energy for every person has increased 2.7 percent.

Thus, with regard to energy consumption in the country, Increase economic efficiency, improve policy and energy management to achieve reduction of energy consumption and thus the country's energy sector development with environmental approach should be stressed in the country.

Power Consumption

Power is as an energy carrier which in many parts could not be replaced and the amount of access to it is considered as one of the indicators of economic growth and sustainable development. According to the Statistics of hydrocarbon Balance Sheet in the whole country, the country's total electricity consumption growth was 6.4 percent during the period 1381-91 and had the 5.9 percent increase over the previous year. However, the average annual growth of the total number of Power consumers in this period has been 5.3 percent which in the 1391 compared to the previous year with the growing of 5.4 percent reached to over 28.7 million consumers.

The share of energy costs in rural and urban households

In general, the average total cost of urban and rural households has been increased respectively about 23/87 and 28/84 percentage compared to the previous year due to the sharp increase in total household spending resulting from the currency exchange rate. , although, Rising energy costs in the basket of household spending can control consumption but, it would not be desirable for households due to non-replacement.

Energy subsidies

Energy subsidies are followed by increased energy consumption in the country due to the gap between domestic and international prices of energy. In this regard, This gap was slightly modified in 1389 with applying law targeted subsidies and increase prices of energy carriers inside the country , But in 1390, with stabilize domestic prices and raise prices in the area, the price gap has increased again and in 1391 a sharp increase in the currency exchange rate, this gap has increased to nearly close the price gap before the law. Although some increasing priced do not consider as factor in the control of energy consumption, However, as statistics of energy consumption in the first few months of price increases have shown, Lever of minimum price in the short term can pave the way towards energy efficient consumption.

Environmental pollutants

With the increase in energy consumption, emissions of pollutants caused by combustion of energy carriers are also rising. So that carbon dioxide emissions as the most important greenhouse gas, in 1381was the equivalent of 5.14 tons for per person that this rate has increased to 6.54 tons for per person. Figure 4 shows the emission process of pollutants during the period 1381- 91.

As shown, emissions of pollutants in the country was an increasing process during the period under review and in addition to serious damage to the environment and human health,

This process can be followed by international obligations for emission reduction and emission of greenhouse gas for the country.

Environmental Sustainability Index (EPI) also does not draw a good status for the country, So that on the basis of EPI reports that in 2012 for 132 countries by the World Bank is providing, Our country after Oman with the rank of (110), Azerbaijan (111), Cameroon (112), Syria (113) is ranked in 114 th. From this point of view more attention to the environment should be in the agenda of the country.

The consequences of continuing current trends in the energy sector

As shown in the previous section, the energy intensity of the country due to various reasons such as growing urbanization, inadequate technology in production, lack of energy management, economic structure, inefficient and unrealistic prices is increasing. So if nothing to improve these indicators in the country have not considered and not to the executive, the future of the country will be a very bad condition. If this trend continues, the amount of energy losses in the country for various reasons of design, engineering and technology management will be rising and social costs has accelerated due to the emission of pollutants and environmental degradation.

If energy constraints will appear in the future, public access to energy particularly vulnerable will decrease. On the other hand without necessary infrastructure and reform as well as necessary investment, the competitiveness of domestic products in international markets declined and foreign exchange earnings as a result, will decrease.

CONCLUSION

Given the importance of energy issues in sustainable development issues, this article introduced and examined some of the indicators of sustainable development indicators in the country energy sector over the period 1381-91. Indicators examined included: energy consumption intensity, the final consumption of energy, per capita energy consumption, power consumption, the share of energy costs in household, energy subsidies, environmental pollutants. Examining each of these indicators trend indicate the gap of this part from the sustainable development goals of energy. The main reason of it is the growth of urbanization, inadequate technology in production, lack of energy management, unrealistic prices and inefficient economic structure which on one side leads to the increased energy consumption in spite of low economic growth and on the other caused to the many social costs due to an increase in environmental pollutants and serious damage. In such circumstances, an energy strategic plan with a highly enforcement to be felt. Although, there is requirements to improve these indicators in different programs under various laws such as the reform of the energy consumption patterns and other, but because they had not necessary enforcement, the energy sector is far from the ideal situation significantly. So on the threshold of the sixth socio-economic and cultural development programs, the necessity of developing programs to improve these indicators is needed more than ever. Programs, that with applying energy efficiency strategies, education and awareness with potential application of technical, economic, technological minimized environmental damage caused by energy consumption and considers a macro-oriented approach in all aspects of country development.

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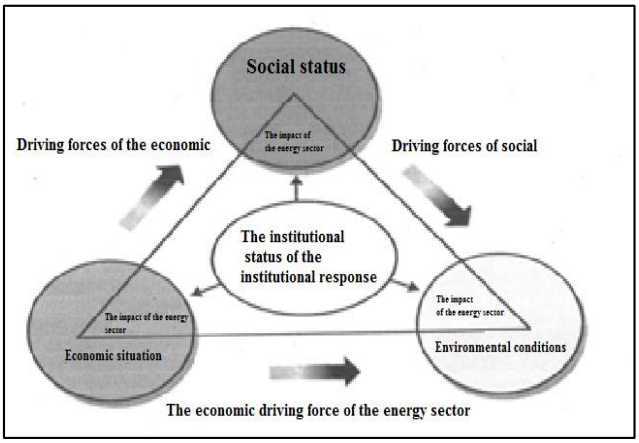

Figure 1: the relationship between dimensions of the stability of the energy sector

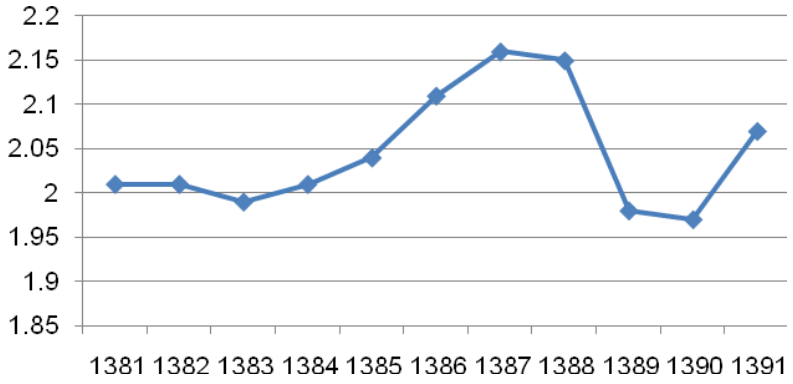

Figure 2: the final energy consumption intensity in the country during 1381-91 [2]

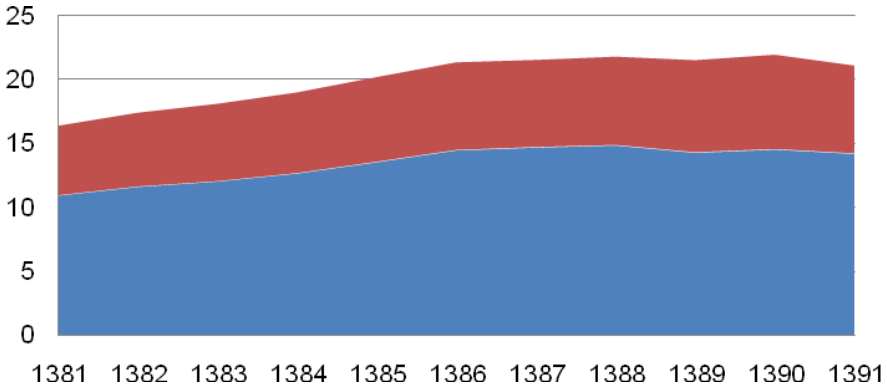

Figure 3: production statue GDP per capita and per capita consumption of energy 1381-91

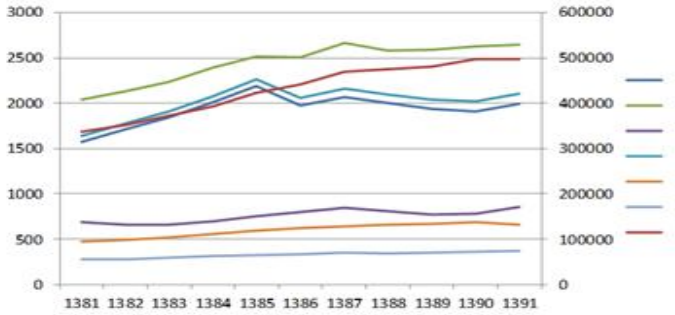

Figure 4: the emission process of environmental pollutants during the period 1381- 91

Table 1: List of sustainable development indicators of the energy

Social Dimension	1. The share of households or population without electricity or commercial energy, or with high dependence on non-commercial energy 2. The share of household income spent on fuel and electricity 3. The energy consumption of households in each income group 4. The casualties caused by accident per unit of energy produced	1. Population: total - urban 2. capita gross national product 3. Final energy prices with subsidies and taxes and without subsidies and taxes 4. Various economic sector in value-added gross national product 5. capita distance traveled on trips, total trips, trips within the city by means of public transport 6. The level of freight activity: General and various modes of transportation 7. capita land 8. Industrial added value 9. Energy intensity: in the industrial sector, transportation, agriculture, commercial and public, housing 10. Energy intensity in energy production 11. Energy combination: final energy, power generation, primary energy supply 12. efficiency of energy supply, efficiency and the efficiency of fossil fuel in power generation	Economic dim ension
Environmental dimension	1. The amount of air pollutants, including particulate matter, CO2, SO2, NOx 2. The The focus of pollution in urban areas, including particulate matter and ozone, CO2, SO2, NOx 3. Areas that are acidic due to excessive pollution 4. The amount of		

	Greenhouse gas emissions 5. Radioactive pollution: The coastal areas from oil pollution 6. The amount of solid waste 7. The density amount of solid waste in order to organize 8. Producing radioactive waste 9. The density of radioactive waste 10. The number of areas in which energy production facilities exist 11. Unexpected and accidental deaths and mortality due to the fuel chain failure 12. Part of the capacity utilization of hydropower resources that are currently not used 13. Processing of proven reserves of fossil 14. Recovery of proven reserves of fossil 15. The amount of proven reserves of uranium 16. The life expectancy of proven reserves of uranium 17. The intensity of use of forest resources to provide charcoal 18. Rate of deforestation	13. Development Status of technologies to reduce pollution: Scope of activities - Average performance 14. Energy consumption per unit of gross domestic product 15. The cost of the energy sector: the total investment, environmental control, exploration and development of hydrocarbon reserves - research and development in the energy sector, the cost of energy imports 16. Per capita energy consumption 17. Indigenous energy production 18. The dependence on energy imports	

Table 2: recoverable liquid hydrocarbon reserves of Iran in late 1384-90

1391	1390	1389	1388	1387	1386	1385	1384	Description
[1]156/53	156. 53	154. 58	151. 17	137. 01	137. 62	138. 22	136. 16	Crude oil, condensate and gas condensate (Billion barrels)
127	96	95	94	84	84	85	85	Reserve life (years) *

1 reserve is at the beginning of the year of 91.

Table 3: Estimated natural gas reserves and Cumulative production of natural gas during the years of 90to 1387. (Trillion cubic meters)

1391	**1390**	**1389**	**1388**	**1387**	Description
33/8	33. 8	33. 6	33. 1	29. 0	Recoverable reserves
20. 7	20. 7	12. 8	20. 5	19. 8	Marine areas
13. 1	13. 1	20. 8	12. 6	9. 2	Land areas
3. 8	3. 8	3. 6	3. 4	3. 2	Total cumulative production
0. 7	0. 7	3. 0	0. 5	0. 4	Marine areas
3. 1	3. 1	0. 6	2. 9	2. 7	Land areas

Table 4: Primary energy intensity in some countries in 2012

Energy intensity (tons of oil equivalent / thousand dollars)		**Country**
***Purchasing power parity**	**Current prices**	
0. 14	0. 14	United States
0. 12	0. 11	Brazil
0. 10	0. 09	Germany
0. 09	0. 08	England
0. 11	0. 09	France
0. 28	0. 31	Russia
0. 11	0. 14	Turkey
0. 12	0. 29	India

0. 25	0. 30	Arabia
0. 24	0. 55	Iran
0. 10	0. 09	Japan
0. 22	0. 30	China
0. 17	0. 22	South Korea
0. 15	0. 17	Average world

* International year' rates

Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Civil Responsibility due to Violation of Privacy

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Received: 19 Mar 2015 Revised: 20 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

Private privacy or citizenship right is from words entered into legal literature of Iran explicitly and during current years; there are important steps in order to internalize it. Although, the comprehensive concept is not offered between different cultures on definition sanctum. But as for its nature value, the important respect is considered for it. Citizenship which has close relation to private privacy is researched in Iran's law and international compacts to clarify its merits. Doubtless, freedom is so important for this research as one of the main symbols of citizenship and its perfect pathology and effective factors as for increment technology growth and modern.

Key words: Sanctum, Private and Public Sanctum, Civil Responsibility, Damage Compensation

INTRODUCTION

Private privacy shall be immune as part of human life from view and glance of other persons and it is clear problem for human since old times, but what is private sanctum? And which are fundamental elements and what are important. These are cases were being responded in different schools during research. Human munificence is as fountain of human law and shaping personality and growth of persons which is cited in words of God, then the accurate definitions are conferred in which talked on constitutional law of Iran and world announcements of human right which are methods in order to reach their rights. Thus, in this research, private privacy is discussed in Iran's and international law and from religion point of view and in fact, informing people to their rights is based on constitutional law. In other side, it is tried to respond that in what scale the persons can behave and their behaviors cause damage others (article 40 of constitutional law and element without loss without loss in Islam) and if causes loss and damage others, in what manner the law confronts it? And what punishment will be determined?

The main question is to determine bases of private privacy of persons from Islam point of view and internal agreement and at same section; it is focal point of research which are operative warrant on violation of private sanctum. In first question, the hypothesis is based on save human munificence as caliph and substitute of God and about second question, it is required person like real and legal identities to compensate damages in different forms.

First speech) privacy means close places and near of anything where it is required to exploit more like road and water lane and a place for pitting soil and like it and part of home which needs for remove resident's needs.

First paragraph) privacy consists of three words H.R.M and means to limit, constrain and munificence means which is not permissible to break up and anti lawful and shall be prevented from it and privacy means prevented and lawful.(Safirpour, 1998, pp240). The lexicography means privacy as unexploited and prevented which is not permissible like it (dehkhoda, 1998, pp 8904) around and enclosure of home, around home from rights and a place for water infusion and required place for home and part of land which is required and no one is not partner(Moien, 2003, pp 973). Private privacy means something including all like general belong to all and public (dehkhoda, 1998, p 0930). In this field, Imam Khomeini said: privacy is different from small or large of the owner (mousavi Khomeini, Beirut, 1999, pp 199) because required benefits are different although, it is established and home. Or a land which is used in order to establish home, garden and farm and so on. That section of land which is used totally and belongs to materials and is following thing established and in the jurists' point of view, privacy means prevention because aggressive is prevented from others. (jafarilangroudi, 20009, pp 449). Second paragraph) there are different means about privacy and it is difficult to determine its framework. Some cited it as a tool for control life domain and others regard it as target for protection human personality and munificence. Thus, privacy is right for all persons against entering without permission into life and some of legal scientists interpreted it as: freedom in life and home and affairs, negotiations and personal secrets (ahmadi, Bahar, 2008, pp 6) which is private privacy pertinent to be unknown or remote from public domain. And also, in international documents and different law, there are different definitions. Private privacy is domain of personal life which is not suitable to violate it without comprehension human needs and ownership of people to honor and prestige is the most important aim of private sanctum. And in other side, we can say that private privacy consist of behavior and specified thoughts which are not being disclosed by the persons, in fact, private privacy is treasure of secret and internal thought. (Naghibi, spring and summer 2010, pp6). Therefore, some others regard private privacy as to leave and releasing unreasonable person or determine what scale of personal information will be transmitted. By offering above definitions, it is recognized that there is not consent about comprehensive definition about it, but there were more efforts and western jurists defined it as: 1- privacy means right of someone to leave be alone and lonely 2- privacy means to make decision freely to what scale disclose their behavior for others 3- privacy means immune against disclose physical tools or information in their life and family. Privacy consists of three steps: secrecy, unknown and loneliness (An International Survey of Privacy Laws and Development, Washington Banisar, David, Privacy & Human Rights,) 5- privacy means to be alone which consists of personal communications like telephone negotiations, private, safety dialogue and environmental security like physical and protection from sentence.(Oxford, A dictionary of Law,Edited by Elizabeth A. Martin, UK, OxfordUniversity Press, 2003, p. 381) third paragraph) privacy and its classes: of the most important problems about privacy is about symbols of and its types which the critics have not consent about its classes and some classified it as four parts and other classed it as 6. 1- Bodily privacy, bodily inspection by cloths, bodily inspection by taking off clothes, detection of internal orgasm.

Spatial privacy (land)

Informational privacy: detection of thoughts, order to known and prevent from dissent

Communicational privacy: postal communicational privacy, remote communication privacy and verbal and face to face communication, internet communication privacy

Privacy of applicant's job and staff
Privacy in media activity
Paragraph Four) Privacy and its types
First paragraph) Defense Land Totality and state
Second paragraph) to establish good adjacent to other countries

Second speech) citizen definition: we can say that citizen is someone who knows personal and total right and defend it and acts and claims it and has specified right and knows there is another person and defense from his rights means defense from personal right for person who participates in urban affair.(rezaee, 2014, pp6). Then, citizen not only means residence in a city for specified duration but sum of legal, personal and social awareness. And lives separation from religion and trend in a society which is legitimate and have compatibility. From Aristotle point of view, one of the most important urban elements is citizens. Thus, what is regarded as citizen is to participate in governmental decision and capability of government which have been said in eulogy and appraisal of Socrates, to perform civil duties and avoid from violation of regulations are two important urban problems. Against the suggestions of his students who said escape from prison said: to obey government is imperative for social preservation so that governmental verdict is harm.(Zare, 2010, pp8)

First paragraph) legal discussion of citizenship and its discussion in different countries: all persons have legal minimization which doesn't pertinent to prestige, fellowship or religion and race or color and gender and they are named as human rights. The quantity of these rights depends on ideology of a nation and civilization and historical backgrounds and there is not specified term in order to introduce said quantity. And in international affairs, the states are willing to observe these scales (jafarilangroudi, 2009, pp 231). Then, reaching to right especially human dreams and wishes is so important during years so that there are more times and bloods, but at last, human found his real right. This revolutionary movement traversed its specified line in Iran and world to reach in current society. Without doubt, the nature of social discipline and aim of regulations is to save personal freedoms and rights and election freedom which made that society. Thus, since when the actions are done based on threat or force resulted to cancellation or lacking penetration, introduces negation of mental freedom and government and volition. (jafarilangroudi, 20009, pp 231)

Freedom as fundamental right from legal famous patterns and elements is to be free and freedom of humans against each other means no human has not province and reign on other. Imam Ali says: don't be other salve, which God created you as free.(Alsharif Razi, 1414, pp 344) dominance on people is for God only he created us and it is imperative to obey him, thus, security of persons covers right of people for life and maintain privacy and use of fair and justice law and freedom going and coming in society and against it, there are factors like stubborn sentence and torture and exploitation which are adverse to human munificence. If we see article 3 of World human right verdict, we can understand that it points to right of people for free life and personal security and acceptance of special right is like as to recognize people's rights. And this acceptance is basic term for all freedoms. And if the person is sentenced in penal affair, all rights and freedoms help person and maintain his security against violation to human personality and if there is not human right, people security will be changed. (Bahmani Ghajar, August and September, 2008, pp 15) we can say in citation of freedom that it is applied as means, separations and headship against force. In other word, freedom is movement which causes the human behaves same as will. From Montesquieu point of view, freedom means to perform something which is permissible by the law (validi, Tehran, 2006, pp 267). Thus, in Islam religion and God's speech, there are more talks about power and freedom. Including in verse 3 of Chapter human about freedom, it is emphasized that we direct human and he is thankful gift or pagan it, then, human is created as free and shall exploit saint gift. This saint gift is same freedom and security which lost life acct innovation and has independence. If this freedom doesn't cause damage other, so that there are more interpretations about freedom, means the right which is recognized by subjective right, it is public freedoms which equals to personal freedom and this is state which compiles sum of freedoms and rights for society which cover civil and political freedoms. Then, civil and political freedoms prevents from government intervention in personal privacy and warrant personal

security and religious taste and also, support from participation of people in determination of their destiny. Article 19 of constitutional law cites Iran's people from any tribe or race of equal rights and some scales like race, language doesn't cause negate these points. But they live under umbrella of law and participate in order to make advanced society and empty from violation of citizenship privacy. And all cases are cited in article 21 of constitutional law point to lacking other rights like women rights which observe by the government and make suitable field for growth and blossom of women and protect from mothers.... Then considers equality between men and women. (Motahari, 2007, pp 35)

Freedom era and legalization: human is on the order of God in any case, thus, intention of human is reference of power and ability which orders him. At last, freedom means intention power then in western law, there is suitable placement between freedom theories. Its philosophy is on three steps: 1- the God makes world discipline 2- human can find the behavior of life in order of God3- patterns dominant on human behavior is recognized as reality. From three steps, it is resulted that John Lack regarded human as tool for realization of life and reach to mind. Because of it, some cited that the nature of human is based on equality by legal and freedom and Manistique regarded it as intentional power. (Katouziyan, 2009, pp 150)

Growth and personal Equality Era: this period is pertinent to era after issuance of world human right announcement which this information influenced more upon freedom and personal security, so that in article 9 it is cited that no one can be sentenced as stubborn but in European convention for protection human right and in article 5 which consists of 5 paragraphs, citizenship right is cited as evolution. First paragraph, in authorized cases, negation of freedom is done , second paragraph is for comprehension into culprit, third paragraph, is immediate attendance in court and trial, fourth paragraph, is strike into sentence, fifth paragraph, compensation for sinless culprit which these concepts are advanced factors for human right. Including countries like Turkey which based on article 19 of constitutional law approved 1982 which has been amended at 2001; negation of freedom is based on court and law which is done by comprehension of charge and claim for the culprits. Thus, another article in European countries is cited and is including Newzeland in eighth part of constitutional law approved 1990 which cited about freedom and personal security and Canada at 1960 which inserted in legal charter of constitutional law and recognized it and emphasized more upon bodily privacy, heath and protection.

Constrain personal security: if we see French as glance, there was not duration for human right announcement which caused French revolution forces won upon Rosso democracy and killed the people. (Sept. 1792) the situation of French revolution was so sever and at 1794, the revolutionists negated the defense right as for Parial law and issued the permission for killing the culprits. Situation of personal security was so unhappy so that by appointing Napoleon could not restore people situation from security point of view. And this problem continued so that any suspicion was resulted to killing, because slogan of leaders was if freedom is the first need of society, security of government is the first need of governments... since in England, there was insight named as social benefit which invented by Bentham. He concluded that aim of target is not peaceful of person. This theory is benefited from public interest and is about quality of them. Pleasure and suffer are from quality affairs and cannot be estimated by them, because of it, Imam Mohammad Ghazali classified them in Kimiyaee Sadat. (ghazali, 2001, pp 45) thus, the result of this study is that in order to discriminate public services, there is not absolute scale and the last scale is discrimination criteria, but it can be accepted that the law is official scale and the last solution for it and the governments don't determine politics concepts which conforms to real. (katouziyan, 1998, 134, 135, 137, 139). Then, political logic has been based in Italia beyween Italian jurists like Enrique Feri and Lomirez who based proof or positivism school and repressed society people. And after second world war, the thinkers issued violation of people announcement and this verdict is like as global ideal which consider human right for security and freedom (Tabatabaeimotameni, 1991, pp5)

Evolution and variation Movement Freedom in Iran: past hundred years in old period, Zoroaster was Iranian prophet who cited about freedom and citizenship right and security and said: congratulate going and coming of people who has animal into home and land and doesn't violate ruins of Mazda powates country. (Zoroaster, 2009, Gaat 12, paragraph 3). And next years after speech, in Islam and Quran verses, these problems are cited and welcomed by people. For example, in verse 58 of Ahzab chapter, it is prevented any disturbance of sinless and emphasized that: they who burn men and women without crime, undertake great load and sin and found suitability of Zoroaster religion and its action with koranic verses in regard to warrant of political freedom.

Third speech) violation of privacy by governments and states: in view of Mark Rotten, the serious threats from the governments is from states and in the most extremist limitation, when the state captures person and sentenced to prison, his prestige is negated fully and the state can loss determination of prestige, addiction experiment of genetics, these are tools in order to violate against people, other citizens prevent from government and perforce, they have to obey government. As for power is extended, the reality of target is appraisable. Usually, citizenship want is usual the people their reaction is recognizable and supervisable. (namakdoust, summer, 2006, pp6) the experience showed that no government ensured that there is no limitation and absolute power. Thus, what is limited for all nations, are not considered. The courts documented other law. This point is not be removed that absence of special definition is not means unimportant so that based on article 8 of European convention for protection of human right and basic freedoms at 1950, all shall respect for them, in the case of national security, society, economical welfare and prevention from irregular discipline, maintain ethical health and protection from others freedom it is necessary in democratic society to have privacy and in opinion of Anglo-Saxon and French.. Also from other sights, in another countries like Germany, organization for maintain privacy informed in its current report. Past year, intervention of countries was so more. Based on it, Greece has first rank between world countries and Germany was on first rank at 2006 and descended into middle. Control private negotiations, internet communications like electronic main and foreign communication are cases which operated by the states (Haghighat, December 2014, pp3)

Now, the question is here are governments under law affair? There is this thought in this research that the state cannot act based on power and force, from old Greece point of view, dictator government is named as doing beyond law, thus, we can say that the first principal of law is the states shall not act it. Thus we can say that the states allow the law behaves like as people wants. Can this state be regarded as fellowship of law? The respond id negation since (violation of privacy occurred) since this state is regarded as dictator one to legitimate and want to tolerate power for welfare of citizens and their wants.(Andro, Sept, 2010, P 5)

First paragraph) civil responsibility due to violation of privacy: civil responsibility means personal implication into compensation to others. (Katouziyan, 2009, pp 150). Civil responsibility is to help violation of privacy and predicated method for compensation. Accordingly, what is regarded as civil responsibility is to return into previous manner and there is doubtless for realization of civil responsibility, three main steps (mens rea) and causality relation between two is imperative and the judge shall compensate in any file (and in other cases) proved it. In any case, compensation is due to violation of privacy and second paragraph) return situation into previous manner is main subject in Iran's law, when the person harms other, he shall compensate and this compensation is like as subjective restoration and compensation is excusable by other methods so that the best way for compensation is to issue verdict and that verdict is mistaken like negation of power on property, ownership situation on property which is done by mistaken verdict of judge and in this case, the loser can demand compensation and claim the durations and times when he is being lost and this subject is discussed in returning prestige law which method for compensation in articles 58 and 698 of Islamic punishment law and article 10 of civil responsibility law and article 171 of constitutional law in cases like excuse, insertion of verdict in newspapers and so on are. In other word, civil law cited that when the property is, the aggressive and owner cannot posses other property or allow him to submit other property. So that, to give same property can loss like beam which is applied in building or thread which is used in cloth sewing or wheat which is mixed with rice. (Nadjafi, 2010, pp 76) and if same of property is mixed with other property which is not

discriminate, there is not but partnership of owner and enemy (Emami, 2006, pp 37), otherwise, rejection of same property is about losing price and in this case, the owner can claim it or based on article 292 of civil law, it is resolved with consent of the parties and in operation of verdict 330 of civil law, there is problem if the loser wants to return the previous situation, he shall tolerate the suffer of civil law. It is like as situation when the car was lost its shield and will not be repaired and then will be replaced. (Katoouziyan, 2009, pp 680)

Third paragraph) Extension of Distributive Justice: Justice is one of the basic discussions which is citable in science and philosophy field. (Motahari, 1982, ppp 37). Then we calssifiy justice as two clusters: 1-penal justice and distributive or social justice. Penal justice means observation of fair and determinants of penal and crimes, then when we regard affair as fair that it is based on law, is suitable by crime and increased in ascending process by repetition of crime. Thus, there are different theories as important insights on social justice. They are interaction benefit, customize and equality…. Which from John Ralz point of view, Justice and interaction benefit is one of the most important theories in domain of social justice. Based on each human realizes special theory to No. then, the justice is for life style in which the opportunity is given to them to reach in their aims and it is possible to make No as wealth and investment and another regards No in spiritual and remove from world. Thus, based on interaction benefit point of view, each people of society shall respect each other because his benefit is threatened against disrespect. In other word, personal logic caused respect to rival's benefit to waiver the interaction benefits. And since the minority of people is on wealth and others are on full poverty, social justice and interaction benefit shall not mean and this theory was cited by Plato, the great Greece philosopher. (Plato, 2009l pp 54, 53)

CONCLUSION

1- Privacy is saint and respectful region for each person and any strange doesn't allow entering it and in the case of inclination, the stranger can enter into it. Thus subject ic cited not only in internal regulations and Koran verses but also in European conventions which privacy is determined by human rights and the privacy is about property and ownership of people to prestige, munificence which are the most important aims of privacy and law protects it severity and someone who live in society shall protect their personal information in a safe place and prevent from disclosing so that others misuse this information because of extortionary. Then, 2- in this article of concluding, when aggressive to personal property by other domain like governments, it is necessary to compensate. Doubtless, the judge selects different method for compensation and returns the situation of the lost to previous situation to maintain prevention manner for civil responsibility.

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Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Contemporary Rural Housing Scheme Considering Traditional Architecture of Iran with Emphasis of Sustainable Architecture (Case study: Villages in Sistan Province)

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Received: 17 Mar 2015 Revised: 24 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

The specific situation of Sistan region in the north of Sistan and Baluchistan province in Iran, existence of twenty -days' winds, low height above sea level, existence of dust in the majority of year, Lake Humun lead the region as one of the special region. The manner of people's conformity with the difficult condition of the region can be as a pattern for the architecture. Unfortunately, in recent ten decades in Sistan like the other region of Iran, the use of modern pattern such as all- glass buildings in the urban areas has become popular. It not only affects urban landscape, but also wastes the energy as a national capital, however, traditional homes in Sistan is preserved with regard to the harmony with the natural situation. In this regard, based on the importance of natural resources maintenance and conformity with nature in modern architecture is one of the effective strategies to build the modern home. There are limited resources which have studied the traditional architecture in Sistan; therefore, there is a necessity to fulfill the fundamental research in this regard. In the study, adaptation of rural housings with environmental situation in traditional architecture has been investigated for finding the main patterns of Sistan's architecture. After analyzing the traditional dwellings of Sistan, some administrative strategies and regulations have been proposed for adaptation with climate conditions; finally, considering the strategies, some designs have been proposed for rural housings of the province.

Key words: rural housing, adaptation to environment, optimal model of housing, wind energy

INTRODUCTION

Rural life and type of villagers' attitudes regarding the world and nature, facilities, their knowledge for production and productivity methods causes that environmental elements are formed as the optimal and simple methods. In recent decades and considering the need for new housing, trends of states to build the rural housings have been increased but most of the time, the orientation had the quantitative nature (Mahdyan & Sartipi poor, 2012). In recent years in all regions around the world, many studies considering the architecture values and benefits have been performed so that Iran is not separated from it. Now, structure of villages of Iran by penetrating the technology and simultaneous with degradation of cultural values become distorted. For providing suitable rural housing, consideration of stable values of traditional housing in rules is an undeniable issue (Mahdyan & Sartipi poor, 2012).

Rural housing is a social, cultural, economic phenomenon which has been built for providing the suitable situation of life. Central desert edge of Iran is region with average annual rainfall below than 200 mm. Clay and dried mud brick is the foundation of desert region's architecture in Iran. The texture of rules is dense and the use of clay which is a material with suitable thermal resistance can confront with summer heat. Introverted houses not only preserve the residents from violent nature, but also provide 120 days winds with open suitable spaces (Mahdyan & Sartipi poor, 2012).

The use of traditional patterns and architecture benefits always is ways for modern architects since the manner of architecture adaptation of each province with environmental situation can guarantee the peace for the community. Real studies related to traditional architecture in some area of Iran such as Sistan province have not been conducted and it causes that we can classify the different type of rural housing in the study by examining the case study of housing in this province. In the study have been tried to introduce a review of Sistan region; then, the features of rural housing of Sistan province by emphasizing on conformity manner with environmental situation have been examined. In addition, images and diagrams have been used for analyzing the plan of some rural houses. In the final section, the optimal patterns of rural housing by traditional architecture of Sistan have been represented.

Features of texture and rural housing of Sistan

Sistan province is an ancient province which has five thousand year history. In the southeast of Iran and north of sistan province, there is a flat plain near Lake Hamun. It is fed by Helmand River which the origin of it is in the Hindu Kush mountain of Afghanistan. Lake Hamun firstly originated from water catchments on the Afghan province. The Harut River flows into the lake on the Afghanistan region. Water after irrigating The lake Hamun enters to the Afghanistan region by Shilah River (Arya, 2014).

Sistan people represent considerable skills for adopting oneself to the environment. Residual houses have been built suitable with regional climate of the region. Each home has an air vent which its vertical duct passes between two walls. The dome roof is very common in the houses of the province. Door of the homes is located on the southeast side against the wind direction (Afshar sistani, 1984).

Dome roof is an obvious feature of each village. The common ventilator in Sistan province has an approach span as an aperture with very low width than its height. The approach span is against the wind direction and is built toward north or northeast. The orientation is conducted in order to break the wind force. If sever wind storm directly enters to the span, all the material of the room will rise and throw to the outside of the entrance door of home. A window is built in direction of wind which is an intrados in its upper section. Some of the aperture in term of the requirement and situation of air follow is blocked by a clod or brickbat. By cooling the weather, gradually many of the apertures is blocked and by begging the summer they is open again.

One of the features for confronting the nature in Sistan homes and the other warm areas is utilization from wind catcher. The element is important and suitable for summer since it leads the wind inside the home. The common interface of all homes in the villages of Sistan province is their dome roof which has been built in the middle area of roof. As it was mentioned, there is a ventilator which there is a wind catcher.

The position of rural houses

Due to 120- days wind blew in Sistan and Bluchestan province and dust in the houses in south side directly prevent from entrance to home. In roof of rural homes, there is some small window facing north. The small window that is used in summer is for entrance of outside air inside the house. Inside the small windowed is filled with wadding material and become wet in order to enter cool air by passing wind from the small windows. It is the best method for cooling the house space in summer. Although, 120 days wind have many dust, lake of it make impossible the heat of summer. In the following chart, the selected houses of Sistan province have been classified and shown comparatively (figure 5)The regulation and provisions for design new houses in semi-cold and very hot and dry climate in Sistan province

Considering the study regarding the rural houses in sistan province which have been summarized the following results is obtained regarding the manner of adaptation of existence houses with province climate that some of the method in modern architecture can be considered as follows:

Building protection against sunshine
Avoiding to select slopes facing east or west to build buildings;
Establishing buildings in the direction of at least sunshine in warm climate;
The suitable materials for the environment in order to limit heat gain;
Use of trees in order to cast a shadow on the building;
Developing building plan in direct of east- west center;
Use of common wall in building sets and create a compressed tissue;
Use of wooden gate at the back of window;
Forecasting the outer space for using when air is desirable
Utilization of daily temperatures variation
Covering external walls with soil;
Use of compact construction materials (high heat capacity);
Use of heavy materials and high- level thermal insulation;
Forecasting the suitable space between external walls and foliage and plants
Utilization of solar energy in building heating
Selecting the slope facing south side for construction of building
Developing plan in direct of east-west axis;
Allocating the spaces facing south;
Forecasting the construction materials with high thermal capacity and dark surfaces;
Use of the walls with heavy construction materials in the south faced
Forecasting the protected external spaces against wind
Forecasting the useful parasol for windows
Decrease of dusty winds effects on the building
Considering the direction of dusty winds to select building establishment

To surround building with integrated and high walls or forecasting forms with central courtyard and expanding the internal space to the courtyard

Use of plan for protecting buildings against wind
Forecasting the small windows in direction of wind
Forecasting the wooden gates for preserving the windows and skylights
Decrease the thermal loss of building
Covering the external margins of the building with plants and evergreen plants
Forecasting the compact and dense plan
Use of low- important spaces such as storehouse as the thermal insulation in walls or buildings
Avoiding to forecast the large windows especially in northern facades
Use of moving network in the back of window as thermal insulation
Forecasting thermal insulation sheets inside the openings

Use of different types of curtain, moving insulation network and gate back of windows in order to prevent the thermal loss;

Use of maximum direct sunlight in western and eastern sides of building
Use of greenhouse effect in design of the porch
Decrease of wind effect on thermal loss of building
Covering the facades facing soil wind for constructing the building
Forecasting compacted plans and creating a set of compressed plan

Forecasting the suitable form in view of decreasing wind effect in direction facing intensive winds, use of one-story buildings

Use of different wind breaker such as tree, wall and fence
Limiting the number of entrance building doors
Complete protection of main doors using tree, fence and surroundings
Use of complete doors in the facades facing wind
Considering to winter wind direction for determining construction of building
Caulking all doors, windows and openings
Certain provisions of openings in Sistan province
Smaller openings is suitable for the province, especially in west and north sides
For south side, 20 % faced level is allocated to openings
For north side, 10 % of faced level is allocated o openings
For west side, 10 % of faced level is allocated to opening
It is better to prevent opening installation for western facades
The space of window under the roof is at least 30 cm for preventing energy loss
Use of reflective window out of the window
Use of double opening
Use of material with high heat capacity in walls and ceiling
The space of window from under the ceiling is at least 30 cm for preventing energy loss
The proposed patterns for rural houses in Sistan province

After examining the present patterns of houses in Sistan province and analyzing all mentioned cases in previous section , some samples is obtained for construction the houses which is stable considering the environmental situation and mentioned regulations . Therefore, it is prevented to construct doom roof as one of the criteria for Sistan houses but the identity of houses is preserved.

Proposed pattern (1): design notes: use of courtyard, non- construction of window facing unsuitable winds, use of mesh walls and trees for disposal of sandstorm, use of water for cooling weather, use of earth- color faced and simple decorations considering Sistan architecture. As the figures show, use of courtyard and access to rooms by yard for preventing intense sun and sandstorms , a fish pond have been designed for entrancing wind from northern side.

The proposed pattern

Designs plan: use of U- shape pattern, non- construction of window facing unsuitable winds, use of mesh walls and trees for disposal of sandstorm, use of water for cooling weather, use of earth- color faced and simple decorations considering Sistan architectureAs the figures show, use of U-shape pattern and access to rooms by yard for preventing intense sun and closing northern sides for sandstorms, the space of fist floor have been designed for agricultural products and second floor have been considered for people living at home. The U-shape pattern is facing east that is suitable for wind.

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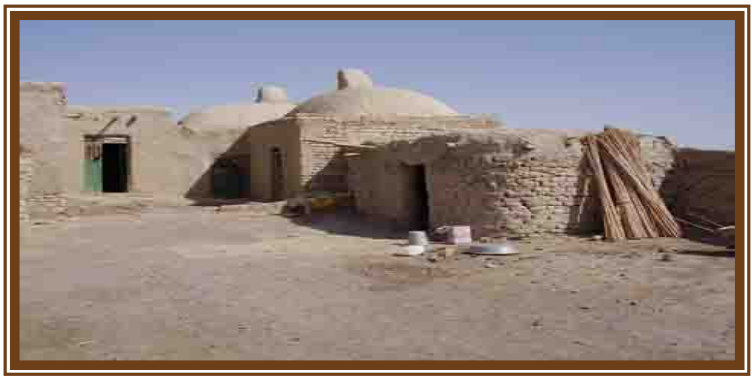

Figure 1: A view of dome roof and one- way wind deflector in Sistan province

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Figure 2: creating and small window (aperture) upon the door for light passing and air flow (Khamak village)

Figure 3: Creating the doors with low height for preventing the entrance of Dune into the space

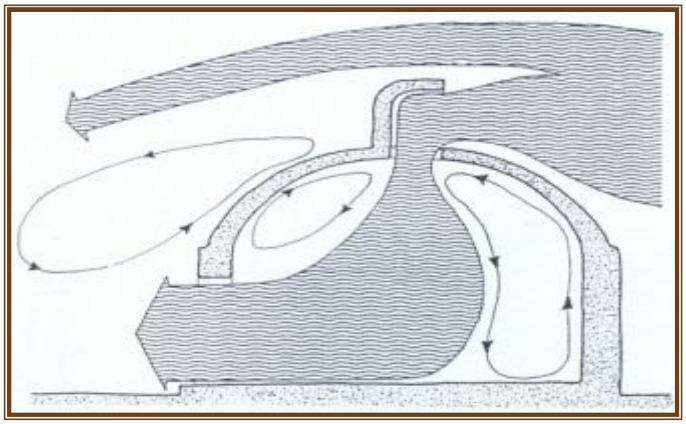


Figure 4: a sample of Sistan wind catcher

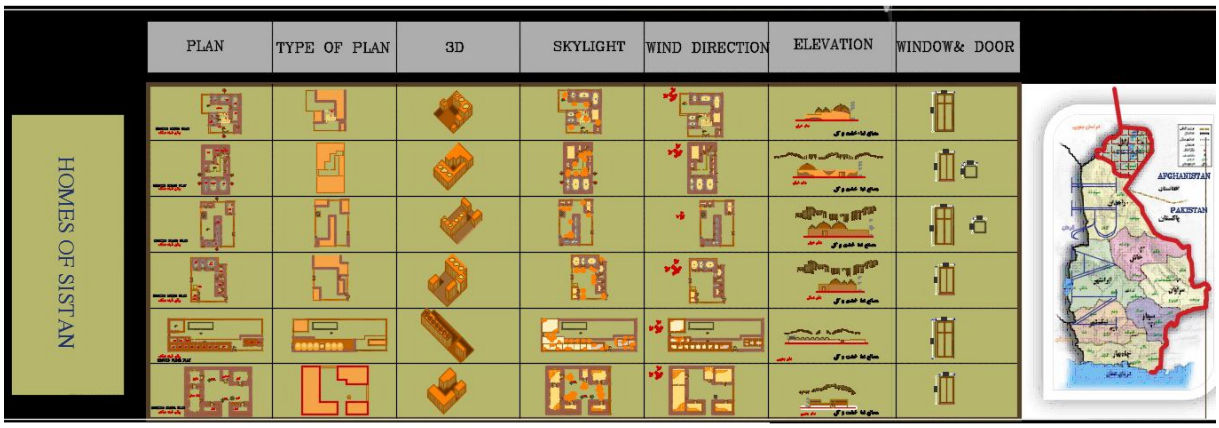


Figure 5: A comparison between different types of rural houses of Sistan province (in view of plan, openings and wind direction)

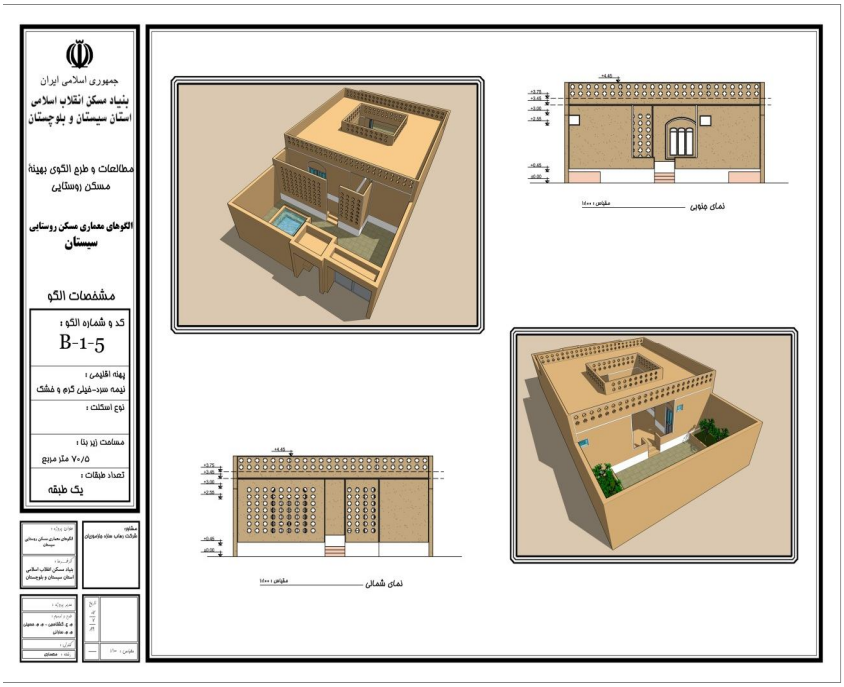


Figure 6: Proposed pattern (1) (three- dimensional design, faced)

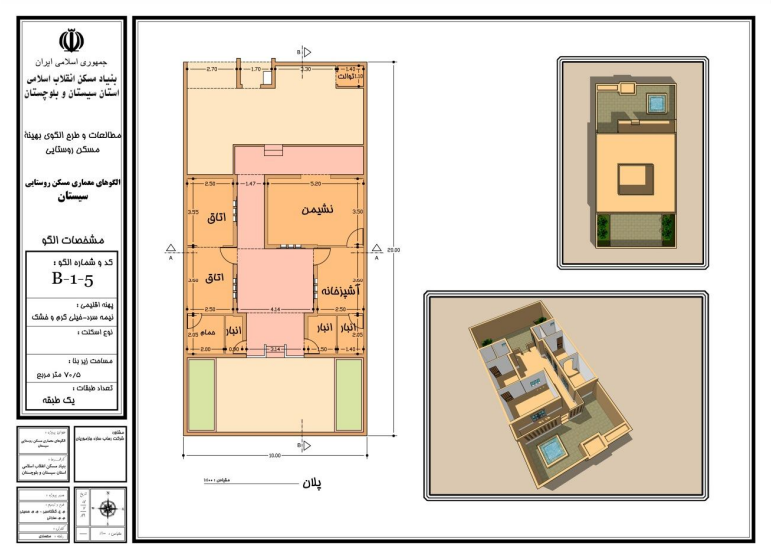
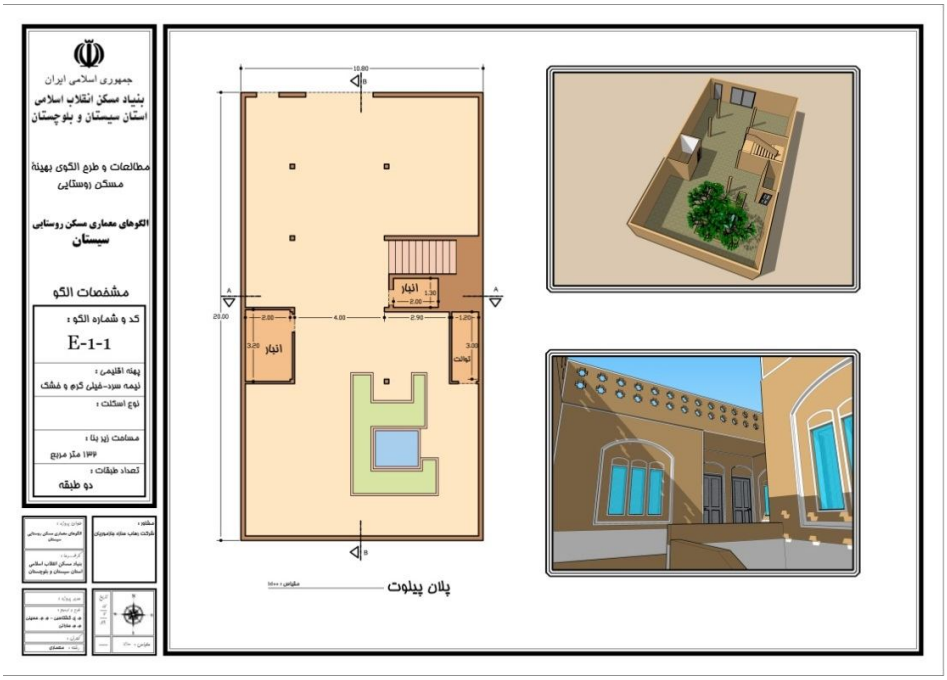


Figure 7: Proposed pattern (1) (three- dimensional design, plan)



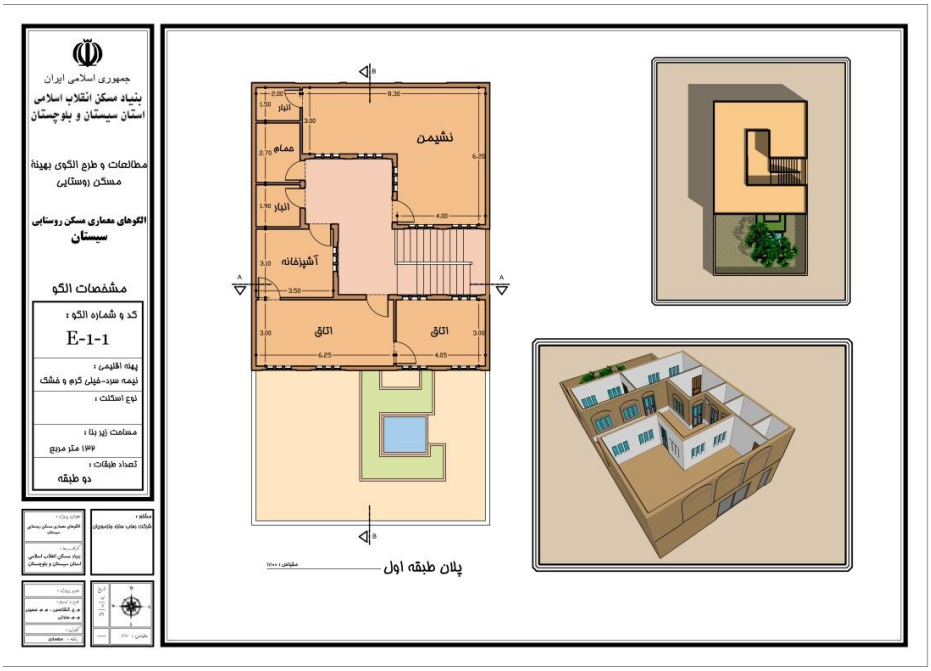
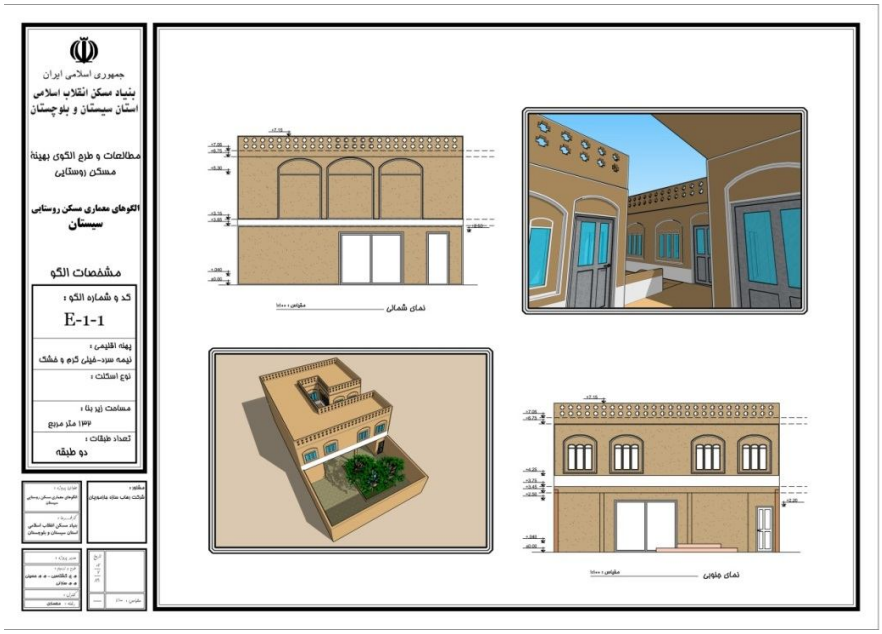


Figure 8: proposed pattern (1) (three- dimensional design, plan and facades)



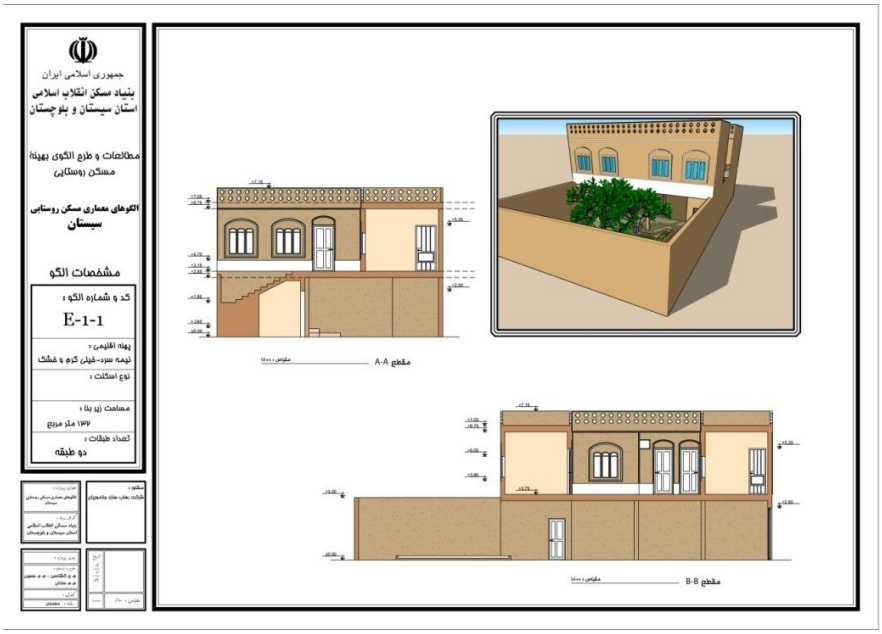


Figure 9: proposed pattern (1) (three- dimensional design, plan and facades and sections)

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Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Modeling the Conventional Concrete Beams Reinforced with Under-Shear GFRP

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Received: 23 Mar 2015 Revised: 26 Apr 2015 Accepted: 30 May 2015

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ABSTRACT

Although some studies have been carried out on the shear strength of concrete beams reinforced with FRP sheets, but the behavior in beams reinforced with FRP is not completely recognized in the shear. Therefore, experimental tests and also finding appropriate and safe numerical methods seem essential to predict the behavior of reinforced components accurately. In this investigation, the effect of different parameters such as span length, area of compression bar, change in section dimensions and the ratio of shear span to effective depth of the beam are surveyed on the strength of concrete beam reinforced with under-shear FRP and the results are analyzed through SeismoStruct software according to the diagrams obtained from modeling the samples.

Key words: retrofitting, finite element, push over, GFRP, SeismoStruct.

INTRODUCTION

For different reasons like damages due to environmental factors such as corrosion or extreme blowing of winds, members weakness due to lack of appropriate maintaining, damages due to earthquake or war, change in usage (for example, conversion of a residential building to an official building), structural changes (for instance, creating openings or removing the bearing members), design errors, faults in construction and change in new guidelines, the rainforced concrete structures may be recognized not having required strength and deformability against the applied loads.

Since the replacement of such structures needs great time and cost, retrofit has been converted into an acceptable way to improve the load bearing capacity and increase the service lifetime of structure. To improve and repair the structures, different methods have been used since past. Among them, use of a new material to be added to cross section of available building member, post-tension techniques, complete replacing of some structural members or change in structural systems can be mentioned [1]. Although all these methods may be valuable and successful, they are uneconomic and or they would lose their efficiency during the time. One of the strengthening systems replacing the above cases is to apply a sheet connector. At first, steel plates were used to strengthen the concrete beams. Though successful, it had some disadvantages like excess dead load applied on structure due to steel usage and the steel corrosion caused that today, steel plates are replaced with fiber reinforce polymer (FRP) and Epoxy resins are also used as a factor connecting the FRP composites to area of reinforced concrete members. Highlighted mechanical characteristics in combination to a very low eight, has converted the FRP composites to a serious competitor for traditional materials.

Although studies have been carried out on shear strength of FRP plate-reinforced concrete beams (ex. ACI 440 in 1996, international federation of concrete structures in 2001 and Japanese association of concrete engineering in 2001), the behavior in beams reinforced with FRP has not been completely recognized in shear. Part of this recognition lack comes back to variety of FRP-reinforcing fibers and different patterns for strengthening and another part is because of different states of failure the beam encounters. On one hand, after attaching these plates to a concrete beam, the structural response changes in many cases like strength, failure type and deformability. Therefore, the subject of performing the experiments and also finding appropriate and safe numerical methods to predict the behavior of reinforced components, seem essential. Among different numerical methods, non-linear FE method can be mentioned which is able to predict the behavior of strengthened members having any type of loading history before and after strengthening. In this investigation, the behavior of concrete beams reinforced with under-shear FRP is surveyed in different states and through non-linear FE method.

SeismoStruct software

SeismoStruct is a FE software package with the ability of predicting the behavior of great deflections in space frames under static and dynamic loads which encompasses both the non-linear geometry and the inelastic materials. This program includes material models such as concrete, steel, FRP and SMA and also a wide library of three dimensional elements with a wide variety of predefined section configurations for steel, concrete and composite sections.

Because of accompanying the stability and numerical accuracy of program in high levels of strains, the non-linear response and damage load of each structural frame type can be determined precisely. SeismoStruct program accepts static loads (loads and deflections) as well as dynamic loads (accelerations) and it is able to analyze eigenvalues, perform non-linear pushover static analysis (common and compatible), time history, non-linear dynamic analysis and progressive dynamic analysis.

Static pushover analysis

SeismoStruct program applies different methods for analysis. One of the most important of these methods which is also used in this investigation is pushover static method. As a replacement for time history analysis, this method is presented by several researchers. Non-linear analysis of pushover lateral load or collapse mode analysis is a brief and simple method to predict the seismic response of structure. Sequences of yielding, deformability capacity and lateral strength of structure can be determined using pushover lateral load analysis. Pushover analysis is indeed an analysis for the step-by-step yielding process of structure critical points which is considered as a powerful tool to study the structure behavior particularly its real behavior under earthquake. In pushover analysis, the structure is placed in a

given shape under a lateral load. Then the load is increasing gradually and the process of crack formation, points yielding and plastic hinges formation are surveyed and ultimately the structure failure mechanism is determined.

Modeled samples

Looking to researches performed in the context of FRP-retrofitting, it could be considered clearly that most of researchers have surveyed small samples and or inapplicable samples, for example samples which are lacking shear reinforcement. Perhaps it may be accepted that for the reason of high costs, investigation on large-scaled and applicable beams is not allowed in laboratory researches. But unfortunately, it is observed researchers who also use powerful analysis software packages, still examine small-scaled and inapplicable samples!

In this investigation, at first using Etabs Software, a one story structure is designed and then according to results of analysis, the sample concrete beam is considered. Then in order to survey the effects of different parameters in the strength of concrete reinforced beams retrofitted with GFRP, 40 samples are considered in order to survey 7 influential parameters in shear strength of reinforced concrete beam.

The sample illustrated in figure 1, is considered as a basic sample which in each state, one of its characteristics is changed. Shear reinforcement details of all samples is similar to the basic sample. To improve the beams, complete spiral pattern is applied. The characteristics of applied materials are considered in table 1.

Samples details

In general, all samples are begun with S letter and second and third letters represent the investigated parameters of those groups of samples and the ultimate number represents the sample no.

Samples of first group are to investigate the effect of span length; samples of second group are to investigate the effect of compressive reinforcement, samples of third type are to investigate the effect of cross section dimensions and samples of fourth type are to investigate the ratio of span to depth on concrete beam reinforced with FRP.

More accurate characteristics of beams are described in tables 2–5

Analysis of results

An increase in beam length has an undesirable effect on its strength. The lesser the length of beam is, the more its strength would be. Based on the modeled samples, it is observed that the strength of SL1 sample which has the least length is more than all other samples and the strength of SL6 sample which has the longest length is less than all other samples. The rate of reduction in beam strength has been approximately steady from SL1 sample to SL6.

The effect of increase in beam span length is desirable on the ultimate deflection. It is observed that with as the beam length increases, its ultimate deflection would be increased so that SL6 beam has had the most ultimate deflection and SL1 beam has had the least ultimate deflection, i.e. as the span length increases, the rate of beam deformability would increase and it would be failed in greater deflections.

An increase in the area of compressive reinforcement has a desirable effect on the strength of reinforced concrete beam. Based on the modeled samples, it is observed that the strength of SRC1 sample which has the shortest diameter among compressive reinforcements is less than all other samples and the strength of SRC7 sample which has the longest diameter among compressive reinforcements is more than all other samples. Although the load

applied on the beam is as shear load, a part of it influences on the beam as a component of bending moment and this moment is able to be converted into both compressive and tensional forces in beam section. On one hand, as the numbers of compressive bar increase, the compressive part of the beam would be improved and the capacity of the beam increases to bear this pressure load and ultimately the main applied load.

An increase in the area of compressive reinforcement has a positive effect on the ultimate deflection so that the SRC1 sample beam has the least ultimate deflection and the SRC7 sample has the greatest ultimate deflection. Indeed because of an increase in used steel, the rate of beam deformability increases.

As the section dimensions increase, the ultimate strength of the concrete beam reinforced with FRP can be increased. This is a result obtained from modeling the SD1 to SD6 samples. The square-shaped SD1 sample has the least strength with dimensions smaller than other samples and the SD6 sample has the greatest strength with larger dimensions. The reason for this is that as the section dimensions increase without any increase in the numbers of reinforcements and stirrups, the compressive phase of the system would increase which is concrete itself and this results in an increase in compressive strength and finally the beam strength.

An increase in section dimensions has not an appropriate effect on the ultimate deflection of the section so that it is observed that the SD1 sample having less dimensions than other samples, bears larger ultimate deflection than larger samples. Since the percentage of the steel is reduced in the section, the beam strength is reduced to bear deflection.

An increase in the parameter of shear span to effective depth ratio has a considerable negative effect on the strength of the concrete beam reinforced with FRP. SSD1 sample which its ratio of span to depth is more than all other samples has the least strength among this group of samples. In other words, as the distance between the concentrated load and support increases (increase in the ratio of shear span to effective depth), the section strength reduced significantly.

The effect of shear span to effective depth ratio on the ultimate deflection of concrete beam reinforced with FRP can be represented with a concave parabola. i.e. it follows the descending branch of the parabola in ratios lesser than three and it follows the ascending branch for ratios more than three branches.

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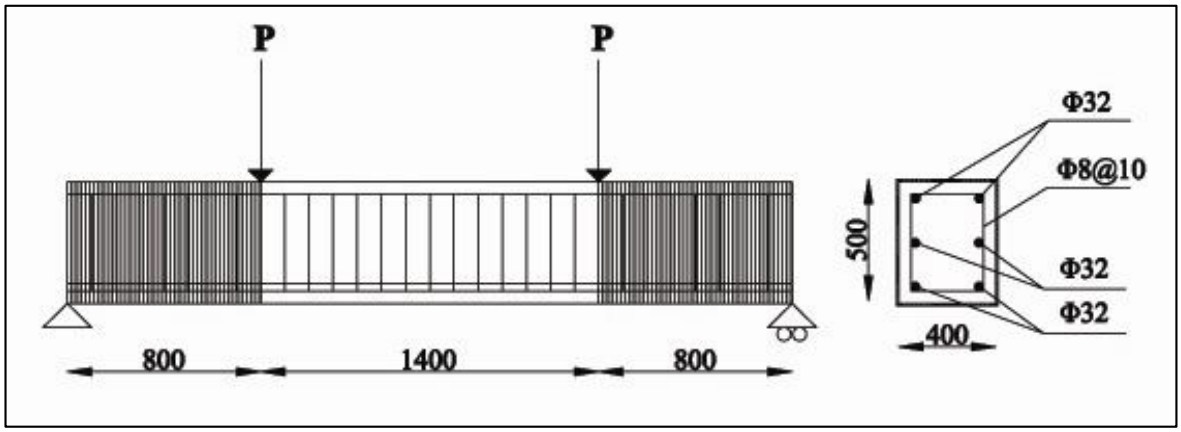

Fig.1. Schematic of basic sample

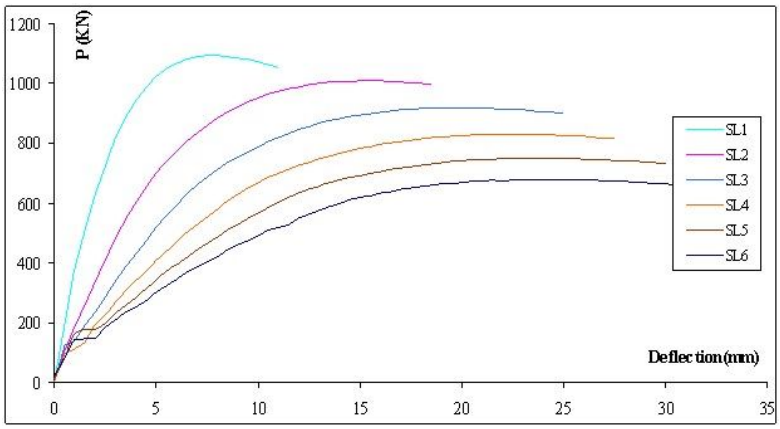

Fig.2. Diagram of load-deflection in type-I samples -investigation on span length influence

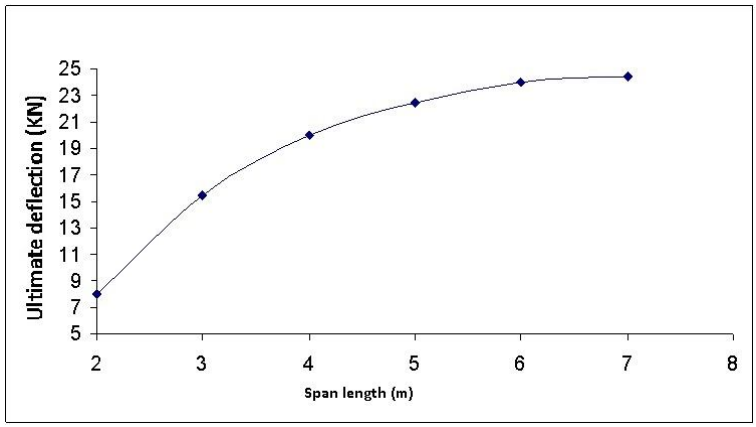

Fig.3. Diagram of ultimate deflection in regard to span length

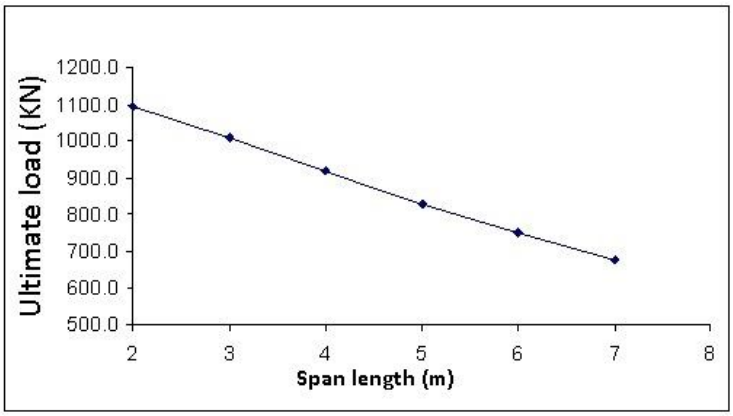

Fig.4. Diagram of ultimate load in regard to span length

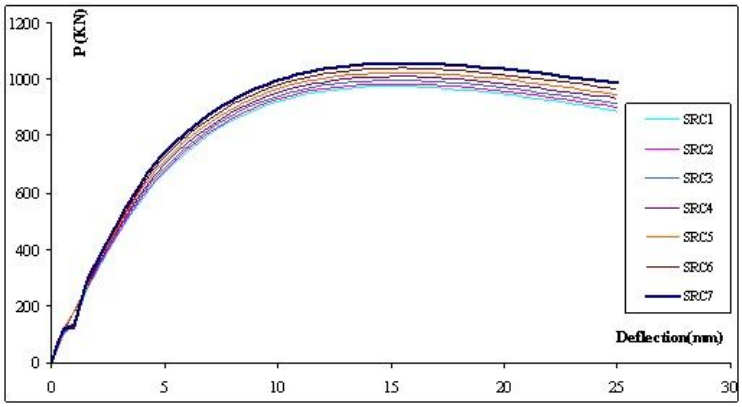

Fig.5. Diagram of load-deflection in type-II samples -investigation on compressive reinforcement influence

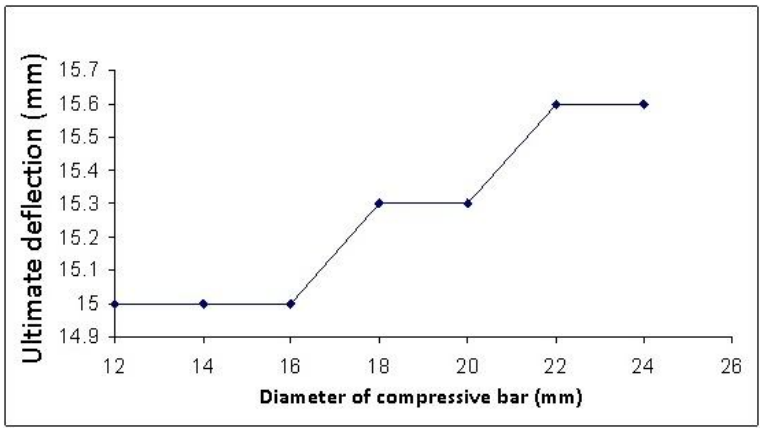

Fig.6. Diagram of ultimate deflection in regard to compressive reinforcement diameter

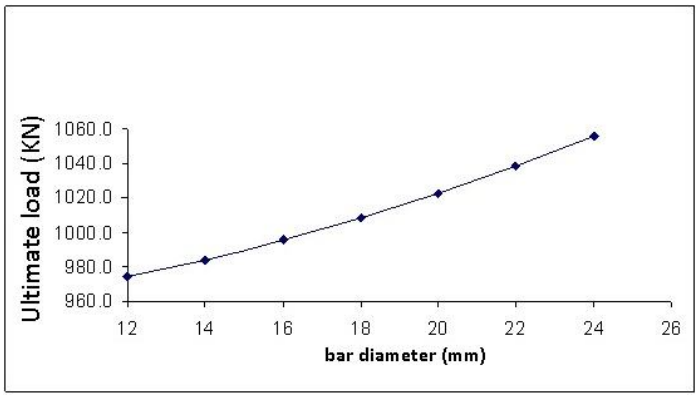

Fig.7. Diagram of ultimate load in regard to compressive reinforcement diameter

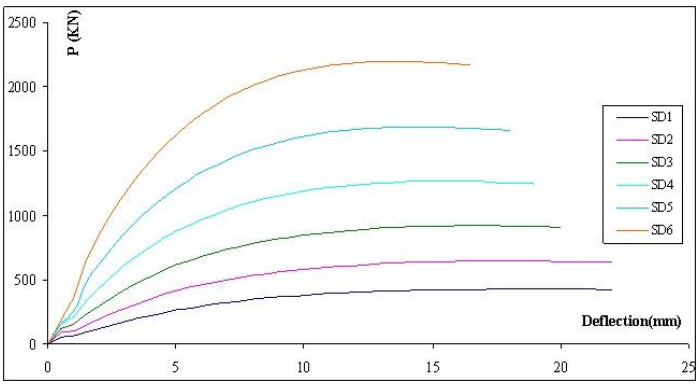

Fig.8. Diagram of load-deflection in type-III samples -investigation on span length influence

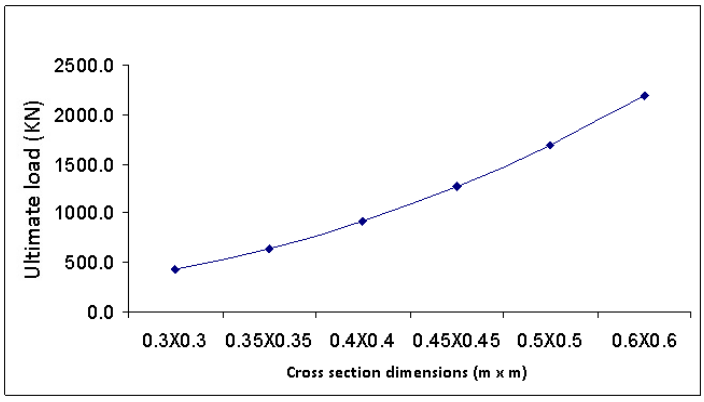

Fig.9. Diagram of ultimate load in regard to section dimension

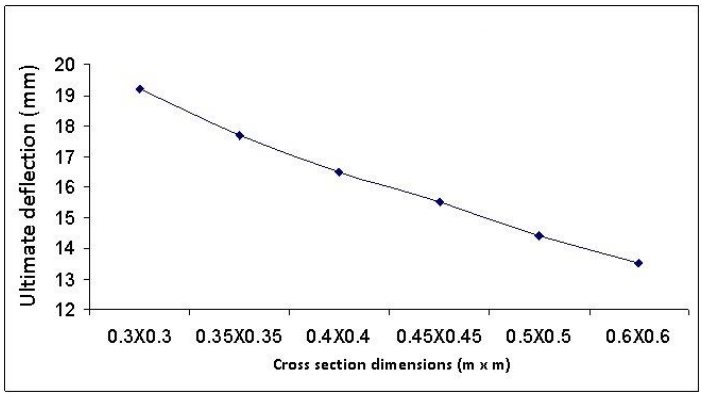

Fig.10. Diagram of ultimate deflection in regard to section dimension

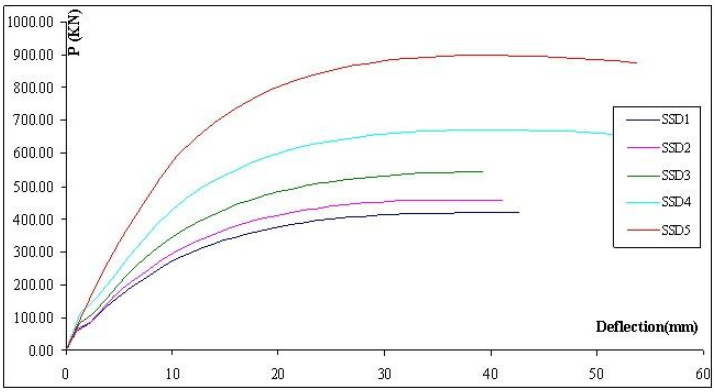

Fig.11. Diagram of load-deflection in type-4 samples -investigation on span length influence

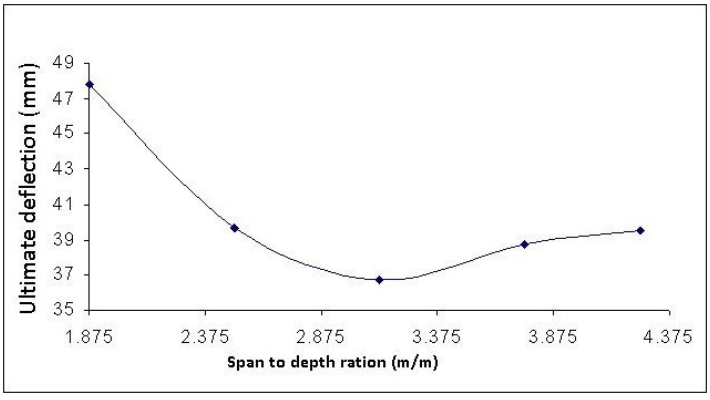

Fig.12. Diagram of ultimate deflection in regard to span to depth ratio

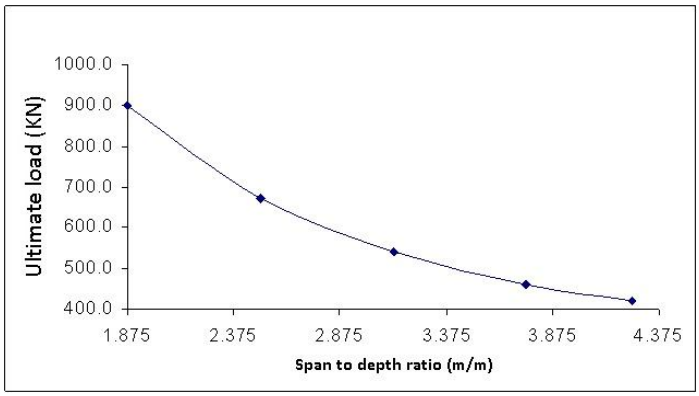

Fig.13. Diagram of ultimate load in regard to the ratio of span to depth

Table.1. Calculating the characteristics of applied materials

Material name	Material characteristics	Value
Steel	Yield stress	240
Concrete	compression strength	30
GFRP	Ultimate strain	0.04 (m/m)
GFRP	Thickness	0.363 mm
GFRP	Fiber orientation	bidirectional

Table.2. Details of type-I samples

Sample name	Concrete compression strength (MPa)	Steel yield stress (MPa)	Compressive bar diameter (mm)	Tension bar diameter (mm)	Section dimensions	Beam length	Numbers of FRP layer
SL1	30	240	32	32	0.4 × 0.5	2	3
SL2	30	240	32	32	0.4 × 0.5	3	3
SL3	30	240	32	32	0.4 × 0.5	4	3
SL4	30	240	32	32	0.4 × 0.5	5	3
SL5	30	240	32	32	0.4 × 0.5	6	3
SL6	30	240	32	32	0.4 × 0.5	7	3

Table.3. Details of type-II samples

Sample name	Concrete compression strength (MPa)	Steel yield stress (MPa)	Compressive bar diameter (mm)	Tension bar diameter (mm)	Section dimensions	Beam length	Numbers of FRP layer
SRC1	30	240	22	32	0.4 × 0.5	3	3
SRC2	30	240	24	32	0.4 × 0.5	3	3
SRC3	30	240	26	32	0.4 × 0.5	3	3
SRC4	30	240	28	32	0.4 × 0.5	3	3
SRC5	30	240	30	32	0.4 × 0.5	3	3
SRC6	30	240	32	32	0.4 × 0.5	3	3
SRC7	30	240	34	32	0.4 × 0.5	3	3

Table.4. Details of type-III samples

Sample name	Concrete compression strength (MPa)	Steel yield stress (MPa)	Compressive bar diameter (mm)	Tension bar diameter (mm)	Section dimensions	Beam length	Numbers of FRP layer
SD1	30	240	32	32	0.3 × 0.3	3	3
SD2	30	240	32	32	0.35 × 0.35	3	3
SD3	30	240	32	32	0.4 × 0.4	3	3
SD4	30	240	32	32	0.45 × 0.45	3	3
SD5	30	240	32	32	0.5 × 0.5	3	3
SD6	30	240	32	32	0.6 × 0.6	3	3

Table.5. Details of type-4 samples

Sample name	Concrete compression strength (MPa)	Steel yield stress (MPa)	Compressive bar diameter (mm)	Tension bar diameter (mm)	Section dimensions	Beam length	Numbers of FRP layer
SSD1	30	240	32	32	0.4 × 0.4	4.25	3
SSD2	30	240	32	32	0.4 × 0.4	3.75	3
SSD3	30	240	32	32	0.4 × 0.4	3.125	3
SSD4	30	240	32	32	0.4 × 0.4	2.5	3
SSD5	30	240	32	32	0.4 × 0.4	1.875	3

Indian Journal Of Natural Sciences www.tnsroindia.org. © IJONS

Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Evaluation of Salinity Profile under Pitcher Irrigation System

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Received: 10 Mar 2015 Revised: 27 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

The effect of pitcher irrigation on soil salinity in saline water conditions was studied in field conditions in distribution of salt concentration in the soil using different water Ec treatments in hot and dry weather conditions. The procedure includes three levels of salinity (5, 10 and 15 dS/m) with three replications. Suitable amounts of sodium chloride (NaCl) were dissolved in normal water for preparing saline waters. It was found that the maximum Ec of soil after irrigation was 3.18 dS/m in Ec3 treatment at 10 cm from pitcher and at a depth of 0–20 cm. Lower Ec value was measured (0.560ds/m) in the Ec1 treatment at 20 cm from pitcher depth of 40–60 cm. The maximum Ec of the soil in all treatments was at the soil surface (20 cm depth) and 10 cm from pitcher, which decreased with increasing depth of sampling. Also Ec increased with increasing distance from the center of the pitcher. Sodium measured in soil moisture levels around the pitcher also follows the pattern of changes in soil Ec. The maximum and minimum amounts of sodium in the soil were observed, respectively, to be 405.3 ppm in Ec3 treatment at a depth of 0-20 cm and 10 cm from pitcher and 122.08 ppm in the Ec1 treatment at 20 cm from pitcher and at 40-60 cm depth. The irrigation systems filtered lots of material and non-soluble salts. Based on the salinity of irrigation water used in the third group and extract soil salinity measured, the soil environment was considered safe for growth of most plants.

Key words: Ec, Pitcher Irrigation, Salinity Profile, Saline Water, SAR.

INTRODUCTION

Increasing competition for limited supplies of freshwater is driving agriculture to improve methods of irrigation and seek new sources of water (Hamilton et al. 2007; Kendall and Pimentel, 1994; Oster, 1994). The clay pot irrigation system is one of the most efficient systems of irrigation known and is ideal for many small scale farmers (Bainbridge, 2001; Mahajan et al, 2001; Lovell and Murata, 1998). Pitcher irrigation is an ancient technique that has been practiced in many parts of the arid world including Iran, India, African and South American countries (Mondal, 1974; Anonymous, 1997). In many developed countries high-tech micro-irrigation methods such as sprinkler and drip irrigation are used increasingly, many farmers in developing countries are reluctant to adopt these methods due to their high initial cost of installation and costly maintenance. Traditional irrigation methods such as subsurface pitcher and porous clay pipe irrigation (Ashrafi et al. 2002; Qiaosheng et al. 2007; Siyal et al. 2009) are often preferred by poor farmers in small scale irrigation projects because of their low cost and high irrigation efficiency (Siyal, 2013).

In subsurface porous clay pipe irrigation, water and solutes not only spread downward and sideways but also move upward due to capillarity and surface evaporation, thus causing salts to accumulate at or near the soil surface. The accumulated salts may be harmful to crops that are subsequently grown at the site, especially directly seeded crops because of their sensitivity to high levels of salinity during germination and establishment (Hussain et al. 1997; Mer et al. 2000; Roberts et al. 2009). Salt accumulation during subsurface clay pipe irrigation is a particular concern in arid regions where annual potential evapotranspiration (ET) is much higher than precipitation (Siyal, 2013). Thus, special management techniques are needed to prevent salt accumulation and the resulting harmful effects on germination or seed emergence (Hanson and Bendixen, 1995; Hanson, 2003). The clay pot irrigation technology is a conservation irrigation system, which saves between 50% and 70% of water when compared to the conventional watering can irrigation system (Okalebo, et al, 1995). The clay pot system is therefore important when water conservation is crucial (Kefa, 2013).

The buried clay pot irrigation maintains stable soil moisture, enables crops to grow in both soil or saline soils and is suitable for using saline waters not applicable with conventional irrigation (Mondal, 1974, 1983, 1984; Alemi, 1980; Mondal et al. 1992). The concept of the use of saline water for irrigation has been advocated by research scientists for more than five decades, as considerable amounts of poor quality water are available in many countries of the Asian and African continents, Australia, North and South America and the dry land areas of Europe (Rhodes et al. 1992). Kenyan research reveals that 61% of normal crop yield was achieved using pitcher irrigation with water of 8. dS/m, while typical irrigation with water of 4 dS/m fails (Okalebo et al. 1995). In one experiment, for evaluation of pitcher irrigation system in soils with high EC for the production of greenhouse cucumber, it was shown that, although in the initial stages of growth due to high soil Ec (10 dS/m), a lot of harm to plants cucumber has been entered, but the watering schedule and special features pitcher irrigation, providing sufficient moisture in the root, the damage generally been met (Keikha et al. 2004). Pitcher irrigation system with saline water for irrigation is very effective. By using this pitcher irrigation system and unusual water, the salt accumulates in the surface of soil and the moisture in the soil around the roots, the concentration of salts in the soil around the roots is reduced (Abu-Zreig and Atoum, 2004).

The design and management of subsurface porous clay pipe irrigation systems requires an understanding of water and solute distribution patterns in the soil around the pipes (Siyal and Skaggs, 2009). Optimal management of salt accumulation during and following porous clay pipe irrigation is especially important for high-value crops that are often salt-sensitive. Understanding patterns of salt accumulation at the end of the growing season enable one to foresee a possible need to leach accumulated salts from the near surface by surface flooding or some other method.

Also the literature is silent about salt distributions around the pitcher as influenced by the salinity of the water used for pitcher irrigation. Keeping the above facts in view, a study was undertaken using saline water to discover the effect on salt distribution in the wetted zone of the soil around the pitchers.

MATERIALS AND METHODS

This study was conducted to Evaluation of salinity profile under pitcher irrigation system in the Zahak Research Station located 25 kilometers southeast of the city of Zabol (30° 53 38 N, 61° 40 49 E) with an altitude of 483 meters above sea level. The average annual rainfall of the area is 55 mm, and the annual evaporation rate is 4000 to 5000 mm. Soil texture is Sandy Loam inmainly Research Station. Soil and water chemical characteristics of the project location are presented in (table 1) and (table 2).

The procedure includes three levels of salinity (5, 10 and 15 dS/m) with three replications. Suitable amounts of sodium chloride (NaCl) were dissolved in normal water for preparing saline waters. The amount of sodium chloride to be dissolved in 1 liter of water was determined using the following relationship (1) (Michael, 1998):

Salt (mg/l) = 640 × EC (dS/ m) (1)

Pitchers were positioned in 3 rows (each row having a set containing 3 pitchers) equidistant from each other in such a way that moisture distribution from one pitcher does not overlap with that from the other (Fig. 1). Each set of 3 pitchers in rest of the three rows was filled with water having Ec as follows: first row (Ec1) 5; second row (Ec2) 10 and third row (Ec3) 15 dS/m. Also 2 m spacing between rows and the pitchers are 0.5 m between in each row. Clay pitchers of the same shape 0.3 meters length, 0.055 meters in diameter and 0.7 liter volume. To position the pitchers in the soil, 0.6 × 0.5 m channels were drilled and pitchers with 0.5 m from each other were placed inside the channels. Pitchers are connected tanks via polyethylene hoses (Keikha et al., 2004; Bastani, 1995). Irrigation water tank was placed at a height of 2 m (Zebardast and Shafieemoghadam, 2010). To measure the salinity of the soil around the pitchers, samples were taken at 3 depths of soil after irrigation (20, 40 and 60) at 10 and 20 cm from the center of the pitcher using auger and were transported to the laboratory in plastic bags. Electrical conductivity and pH of the soil saturation extract were determined using the portable Ec meter and PH meter (Model Oakton 11) of the samples. Sodium solution was measured using the saturation extract by flame photometer (Rhoades, 1982). Sodium absorption ratio (SAR) of the samples was calculated using the following formula (2):

$$SAR = \frac{Na^{+}}{\sqrt{\frac{(Ca^{2+}+Mg^{2+})}{2}}} \quad (2)$$

Where, all concentrations in the formula above are based on meq per liter. Calcium (Ca) and magnesium (Mg) is determined by the US Salinity Laboratory method (U. S. Salinity lab, 1954).

RESULTS AND DISCUSSION

Data analysis shows that the Ec factor between different depths (20, 40 and 60 Cm) is statistically significant ($P<0.05$) (Fig. 2). Ec is not statistically significant between Ec1 and Ec2 treatments at 10 and 20 cm from the pitcher, but Ec1 and Ec2 treatments compared with Ec3 are statistically significant ($P<0.05$).

The Ec distribution pattern was determined for pitchers row1, 2 and 3 using saline waters of 5, 10 and 15 dS /m separately (Fig 3).

The maximum Ec of soil after irrigation was observed (3.18 dS/m) in Ec3 treatment at 10 cm from the pitcher at a depth of 0–20 cm the minimum was observed (0.560 dS/m) in Ec1 treatment at 20 cm and at a depth of 40–60 cm. Ec changes show that the maximum amount of Ec on all treatments was observed at the soil surface (depth 20 cm) and 10 cm distance from the pitcher that because of increased evaporation from the soil surface, salinity surface to be higher compared with soil depth. Moisture content of the soil evacuated because of evaporation causes the moisture out of the soil, and salt remains in the soil (Siyal et al. 2013). With increasing depth of sampling, the Ec soil low. Also, Ec has increased with increasing distance from the center of the pitcher. The percentage of depletion decreases with increasing salinity of irrigation water, which may be attributed to the higher viscosity of water with higher salinity (Naik et al. 2008).

Naik et al (2008) and Siyal et al (2013) showed that the highest Ec is at a distance of 10 cm from the pitcher and a depth of 20 cm; hence, with increasing depth Ec decreases. The accumulation of salt on the surface can be a problem for germination of plant in the first quarter. The maximum Ec was in the third group (Ec3) near the pitcher at a distance of 5 cm, but the Ec decreased with increasing distance from the pitcher at the soil surface. This is because high concentrations of salts are used in irrigation water that the concentration decreases with increasing distance from the center of the pitcher. Usually, salt deposits in the soil accumulated in the front soil surface moisture. Based on the salinity of irrigation water used in the third group (Ec3), salinity levels around the pitchers were well within the safe limit of growing crops (Naik et al. 2008).

Soil Ec range for the 3 treatments at a depth of 60 cm are 0.560 to 1.975 dS/ m, 588.6 to 1641.6 dS /m and 736 to 3183.3 dS /m, respectively. Soil Ec range of different treatments shows that Ec of soil extract is much less compared with salinity irrigation water used. Table 3 shows that there is a significant difference at the 5% level between Ec of soil in different treatments at 10 and 20 cm from the pitcher.

As shown in Figure 3 when initial soil Ec (900 ds/m) and irrigation with the first treatment were compared, Ec of soil had increased 29.1% in 10 cm of the soil surface near the pitcher. But with increasing depth and seepage of water from the bottom of the pitcher, because of increased water hydraulic gradient in the pitcher (Siyal et al, 2013), Ec changes were fixed in depths of 20–60 cm of soil. Ec of soil at this depth has decreased, respectively, to 11 and 14.9% compared with initial soil Ec. Based on irrigation with Ec2 and Ec3 treatments, soil Ec has increased at the soil surface (45.1 and 71.7%, respectively) that by increasing depth the intensity of soil Ec, because of the increased flow of water pitcher, has declined sharply. Ec intensity decreased with increasing soil depth due to the increased intensity of flow of water through the pitcher.

Sodium content measured in soil moisture levels around the pitcher also follows the pattern of changes in soil Ec. Analysis of data shows that the amount of sodium in soil is significantly different ($P<0.05$) between the various depths (20, 40 and 60 Cm) of soil (Fig4). Also sodium levels at 10 cm from pitcher in Ec2 and Ec3 treatments compared with Ec1 treatment were statistically significant ($P<0.05$). Three irrigation treatments showed no significant difference at a distance of 20 cm from the pitcher.

Analysis of data shows that sodium in soil after irrigation is 405.38 ppm in Ec3 treatment at a depth of 0–20 cm and 10 cm distance from the pitcher, which is predictable because of the water quality of this treatment. Lower sodium level was observed (122.08 ppm) in Ec1 treatment at a depth of 40–60 cm and 20 cm distance from the pitcher. Furthermore, it was observed that increasing water salinity decreased the wetting front advance because the viscosity of water increased with increasing salinity, thus reducing the outflow from the pitcher wall and, consequently, the wetting front advance (Naik et al. 2013).

The trend of soil sodium changes is consistent with the trend of soil Ec changes, and they are directly related with each other. There are significant differences at the level of 5% (Table 3) between the distances measured from the

center of the pitcher in different treatments. Pitchers could well play the role of filters for water sodium and prevent excessive sodium in the soil. The highest impact on the water quality is the remaining sodium in the soil at a distance of 10 cm and depth of 20 cm of pitcher (surface of soil). Also, the distribution of sodium in the soil surface, because of evaporation is more compared with that in the depth, and hence, sodium concentration decreases with increasing depth of the soil. Sodium reduction is because of leakage from the bottom of the pitcher due to the hydraulic gradient in pitcher and leaching in the soil around the bottom of the pitcher. But sodium change is constant, and no significant difference was observed at a distance of 20 cm from the pitcher.

There was no statistically significant difference in the SAR levels of the surrounding soil in the pitcher in different treatments of depths between 10 and 20 cm (Fig 6). Only the third group is significantly different compared with Ec1 and Ec2 treatments ($P<0.05$).

The lowest and the highest soil SARs after irrigation were observed, respectively, to be 3.6 meq/l in Ec2 treatment at a depth of 60 cm and distance of 20 cm from the pitcher and 10.4 meq/l in Ec3 treatment at distance of 10 cm from the pitcher and depth of 40 cm (Fig 7). SAR concentration is inversely related to the distance from the pitcher. Soil SAR changes around the pitchers do not follow the trend of sodium and Ec changes, and it is a constant process.This is due to the variable levels of calcium and magnesium in the soil of study area. However, because of the type of salt used in the irrigation water, the greatest source of changes in soil salinity is sodium and calcium and magnesium in the soil have a smaller share.

With continuous use of the pitcher irrigation system increases soil Ec. Thus, leaching before the new planting season, the flooding method of the land must be done. In this system, lots of material and insoluble salts are filtered (Nail et al, 2013). Vasudaven et al (2011), reported, salinity of water in pitcher was increase with time, indicating that pitcher wall retains salt. The pitcher irrigation system is suitable for areas with low-quality irrigation water. Salt distribution around the pitchers was observed well within the safe limit of growing crops, although initial salinity levels of water used were much higher. The study shows that pitcher irrigation may be a promising option for growing plants using highly saline waters and sustaining hardly any salinity hazard or moisture stress.

CONCLUSION

Salt accumulation in soil because of subsurface pitcher irrigation was studied experimentally. Measured soil salinity patternshowed higher soil salinity in the soil profile above the pitcher and lower salinity around the pitcher. When salinity in all treatments observed in soil surface and at a distance of 10 cm from the pitcher was compared, surface salinityis morethan thedepthdue to increasedevaporationfromthe soil surface. The soil moisture evacuated due to evaporation, and saltsremaininthe soil. Aswaterpitcherleakageratedecreaseswith increasing salinity, theleaching rateof third treatment with low-quality irrigation water is lessthan twoothertreatments, leading to increased salt deposition in soils irrigated with this treatment. Soil salinity changes constantly with increasing depth and water leakage from the bottom of the pitcher because of increased water hydraulic gradient in the pitcher of 20–60 cm depth and then gradually declined. In all cases, salinity levels around the pitchers were well within the safe limit of growing crops and the soil salinity around the pitcher is less than the Ec of water into the pitcher. Pitcher could well play the role of filters for water with low quality. In arid regions, it may be necessary to use occasional surface water application to leach salts from the surface soil, especially during the initial stages of the growing season when crops are typically sensitive to salinity.

ACKNOWLEDGEMENTS

This research was supported by the Agriculture and Natural Resources Research Center of Sistan, Iran.

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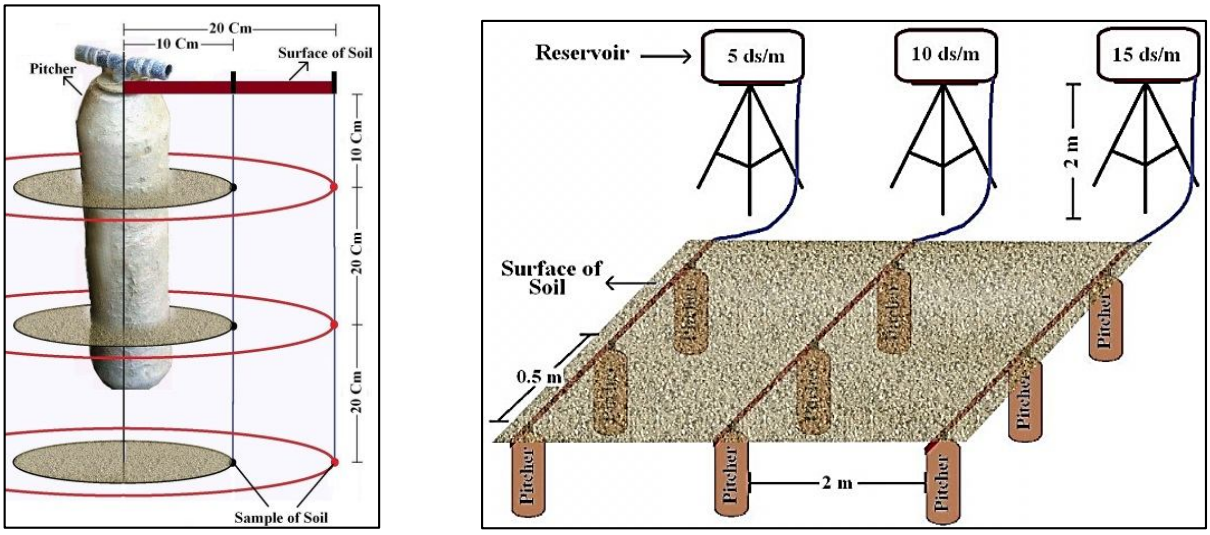

Fig 1.Plan performance experiment and soil samples around the pitcher

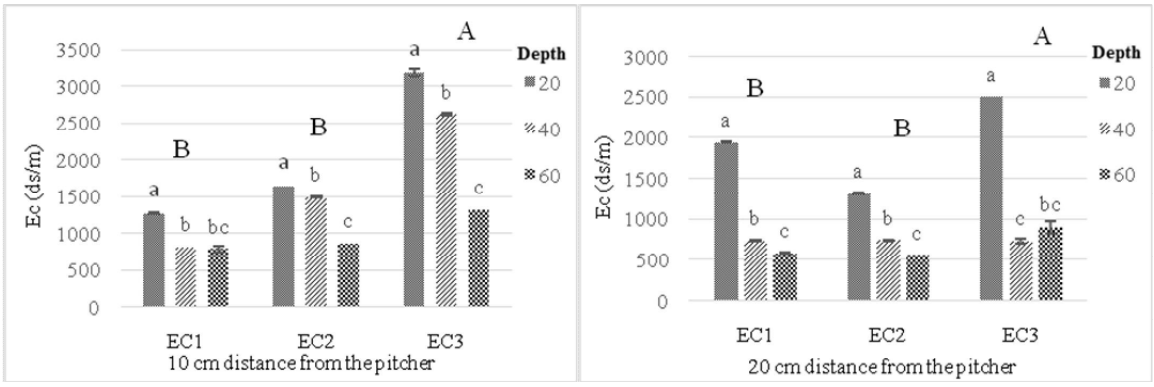

Fig 2.Comparison of different water Ec treatment on soil Ec at depths of 20 to 60 cm (Small letters represents statistical significance between the different depth and capital letters represents statistical significance between the different water Ec treatments)

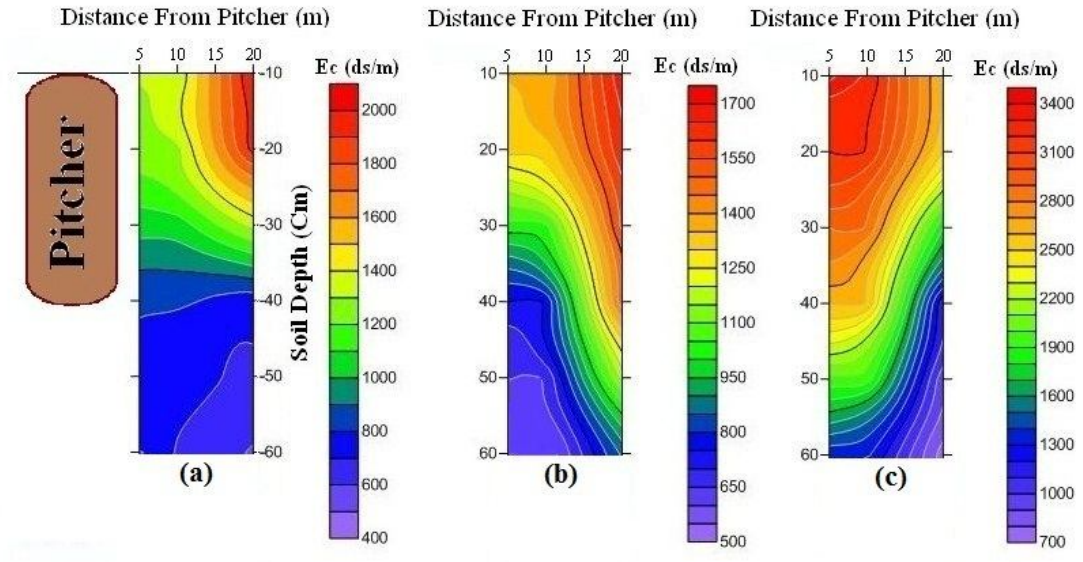

Fig 3. The Ec distribution pattern around of pitcher (a, b and c are Ec1, Ec2 and Ec3 treatments, respectively)

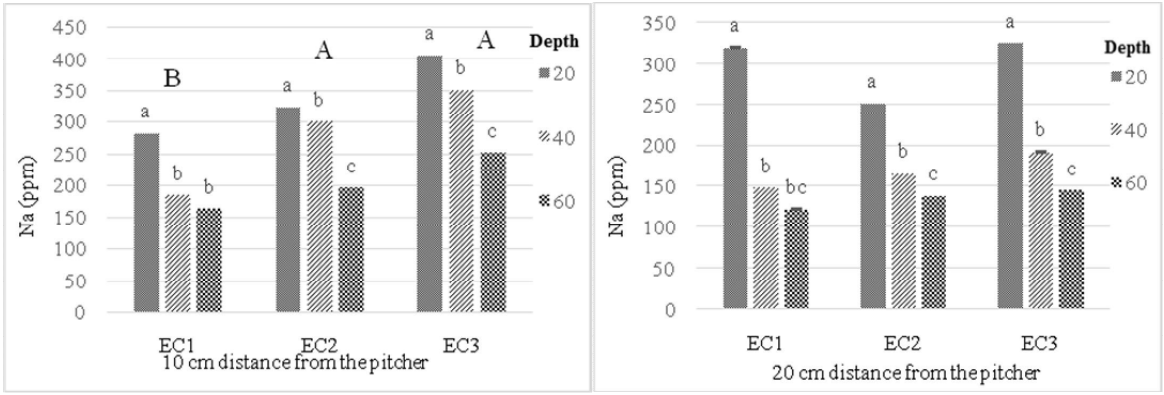

Fig 4.Comparison of different water Ec treatments on soil Na at depths of 20 to 60 cm (Small letters represents statistical significance between the different depth and capital letters represents statistical significance between the different water Ec treatments)

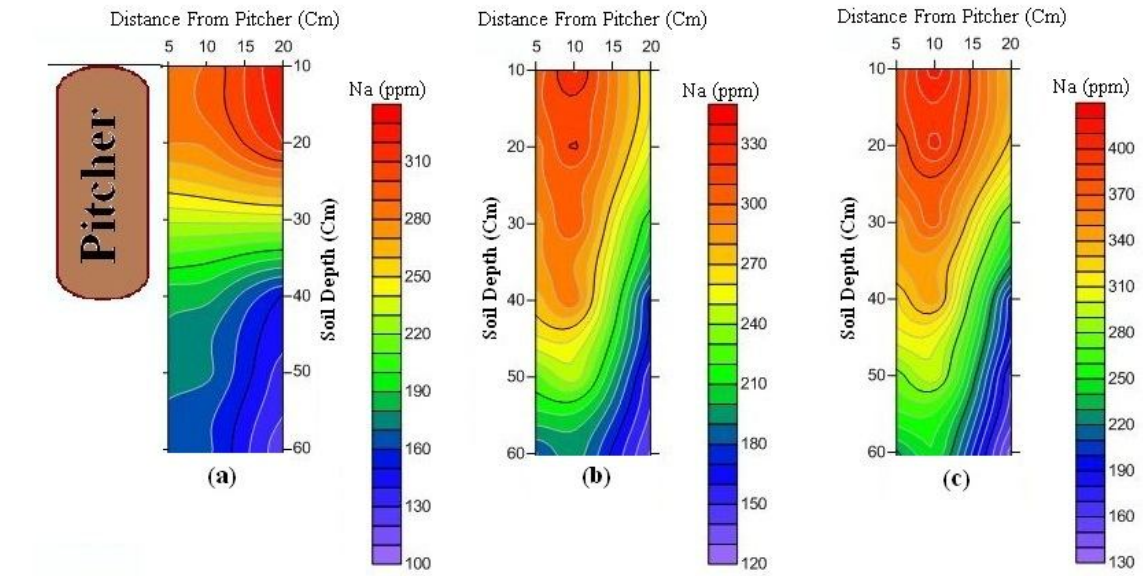

Fig 5. The Na distribution pattern around of pitcher(a, b and c are Ec1, Ec2 and Ec3 treatments, respectively)

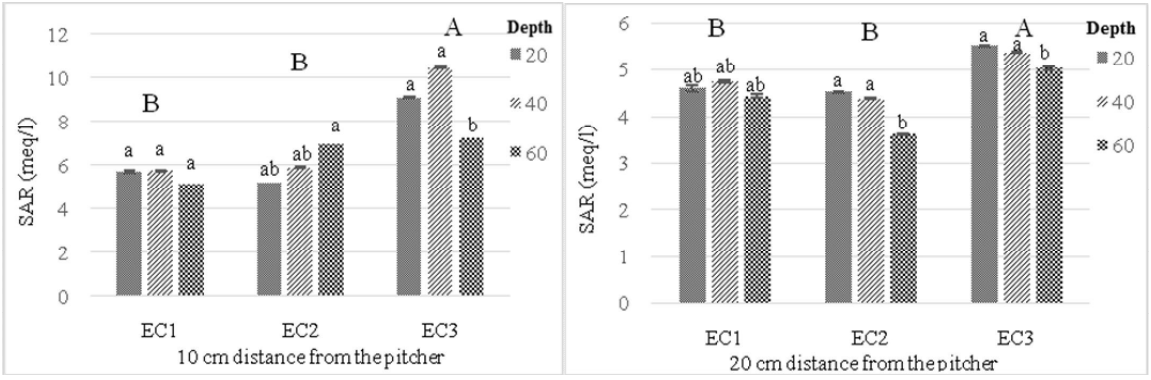

Fig 6.Comparison of different water Ec treatments on soil SAR at depths of 20 to 60 cm

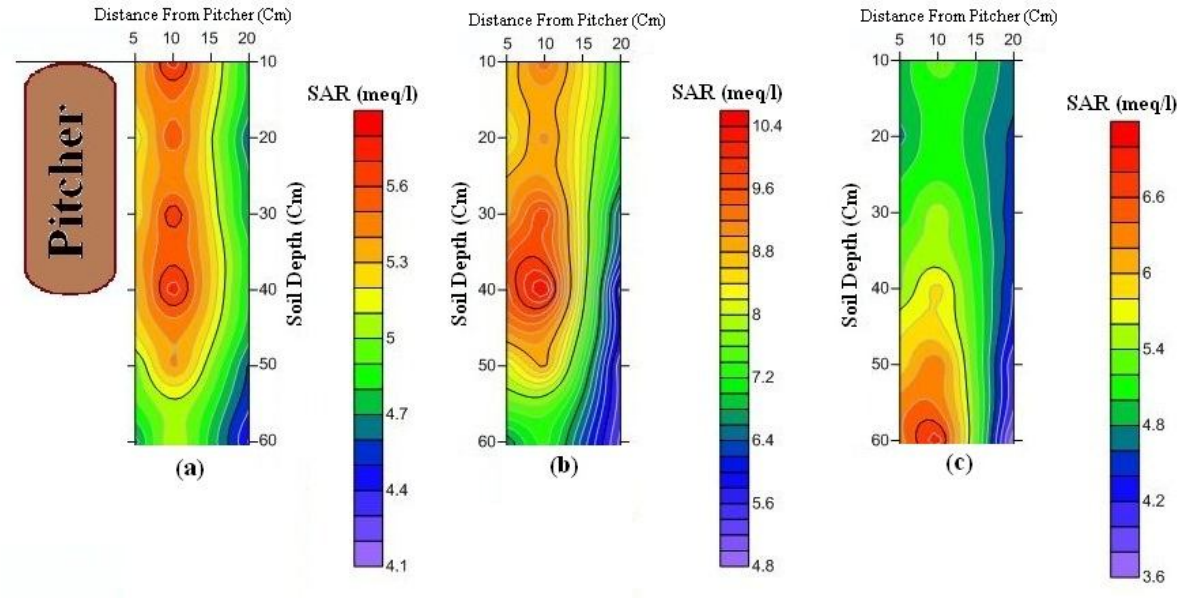

Fig 7. The SAR distribution pattern around of pitcher(a, b and c are Ec1, Ec2 and Ec3 treatments, respectively)

Table 1. Soilchemicalcharacteristicsofthe teststation

Depth (Cm)	Ec (ds/m)	pH	TDS (ppm)	Na (ppm)
0-50	900	7.65	1050	232.1
50-100	1140	7.8	1210	265.6

Table 2. Water chemicalcharacteristics at experimental sites

Ec (ds/m)	pH	HCO_3	CO_3	Mg+Ca	Cl	Na
		(meq/lit)				
0.9	8.2	4.4	0	5.6	3	3.2

Table 3.Comparison of Ec soil, Na and SAR in different distance from pitcher

Distance (Cm)	Ec (ds/m)	Na (ppm)	SAR (meq/l)
0-10	1252.3±72.17[a]	236.58±6.7[a]	6.58±0.1[a]
10-20	929.1±57.24[b]	172.27±8.5[b]	4.60±0.2[b]

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Vol.5 / Issue 30 / June 2015 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Using Liner Discriminant Analysis for Pattern Recognition in Owner's Equity

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Received: 12 Mar 2015 Revised: 20 Apr 2015 Accepted: 29 May 2015

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ABSTRACT

In order to determination of relationships between 6 data that involved Notes receivable, Inventory, stock and other inventory, Advance payment, Long-term assets and owner's equity used Linear Discriminant Analysis. The results show that there are a strong correlation between Notes receivable and Inventory in the study.

Key words: Notes receivable, Inventory, stock and other inventory, Advance payment, Long-term assets, equity

INTRODUCTION

LDA is closely related to ANOVA (analysis of variance) and regression analysis, which also attempt to express one dependent variable as a linear combination of other features or measurements (McLachlan, 2004; Fisher, 1936). However, ANOVA uses categorical independent variables and a continuous dependent variable, whereas discriminant analysis has continuous independent variables and a categorical dependent variable (i.e. the class label). Logistic regression and probit regression are more similar to LDA, as they also explain a categorical variable by the values of continuous independent variables. These other methods are preferable in applications where it is not reasonable to assume that the independent variables are normally distributed, which is a fundamental assumption of the LDA method.

LDA is also closely related to principal component analysis (PCA) and factor analysis in that they both look for linear combinations of variables which best explain the data (Martinez and Kak, 2001) LDA explicitly attempts to model the difference between the classes of data. PCA on the other hand does not take into account any difference in class, and factor analysis builds the feature combinations based on differences rather than similarities. Discriminant analysis is also different from factor analysis in that it is not an interdependence technique: a distinction between independent variables and dependent variables (also called criterion variables) must be made.

Liner Discriminant Analysis (LDA) need less examples in order to obtain a reliable classifier (Pfurtscheller et al. 2000). In the past, LDA was used, because LDA is able to produce an output which is continuous in time as well as in amplitude. LDA was also successfully applied to many different EEG parameters, like band power values (ERD), as well as common spatial patterns (CSP) (Pfurtscheller et al. 2000) and Adaptive autoregressive (AAR) parameters (Schlögl, 2000).

However, sometimes the LDA output seemed to be biased towards one class. This is surprising because LDA provides the weights for the "best" linear separation of the data. After more detailed analysis, some results (unpublished) have suggested, that the different variability for each class causes this bias in the LDA output. This report describes in detail an alternative linear classification method without a bias due to different variability.

MATERIALS AND METHODS

Materials

In the study area used 6 charactristics that is following

Methods

LDA works when the measurements made on independent variables for each observation are continuous quantities. When dealing with categorical independent variables, the equivalent technique is discriminant correspondence analysis (Abdi, 2007; Perriere and Thioulouse, 2003).

In the case where there are more than two classes, the analysis used in the derivation of the Fisher discriminant can be extended to find a subspace which appears to contain all of the class variability. This generalization is due to C.R. Rao (Rao, 1948). Suppose that each of C classes has a mean μ_i and the same covariance Σ. Then the between class variability may be defined by the sample covariance of the class means

$$\Sigma_b = \frac{1}{C}\sum_{i=1}^{C}(\mu_i - \mu)(\mu_i - \mu)^T$$

where μ is the mean of the class means. The class separation in a direction $\vec{w}$ in this case will be given by

$$S = \frac{\vec{w}^T \Sigma_b \vec{w}}{\vec{w}^T \Sigma \vec{w}}$$

This means that when $\vec{w}$ is an eigenvector of $\Sigma^{-1}\Sigma_b$ the separation will be equal to the corresponding eigenvalue.

RESULTS

In the study used 6 data consist of:
A= Notes receivable
B= Inventory
C= stock and other inventory
D= Advance payment
E= Long-term assets
F= owner's equity

Relationship between each of data with Notes receivable by Linear Discriminant Analysis was show in Figure 1 to Figure 5.

CONCLUSION

In the research were used 6 inputs that involve Notes receivable, Inventory, stock and other inventory, Advance payment, Long-term assets and owner's equity. We can use the Linear Discriminant Analysis for determination of relationships between a verity inputs.

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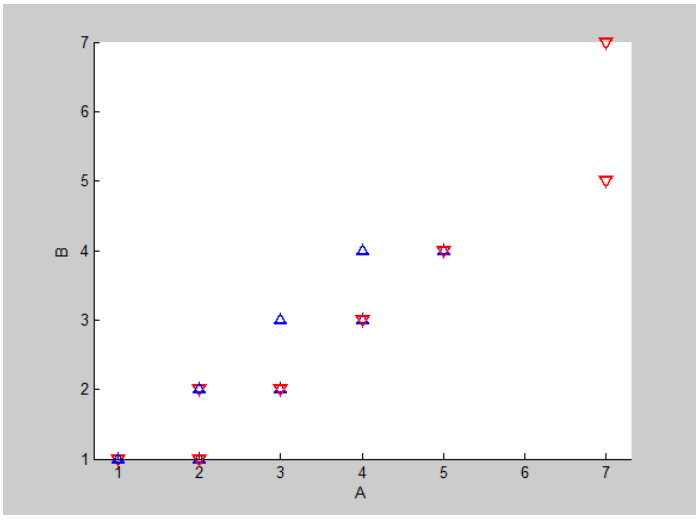

Figure 1. Relationship between Notes receivable and Inventory by Linear Discriminant Analysis

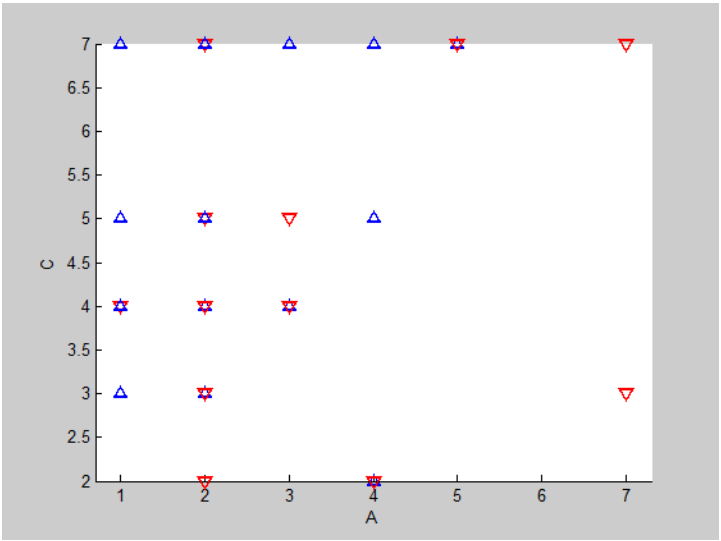

Figure 2. Relationship between Notes receivable and stock and other inventory by Linear Discriminant Analysis

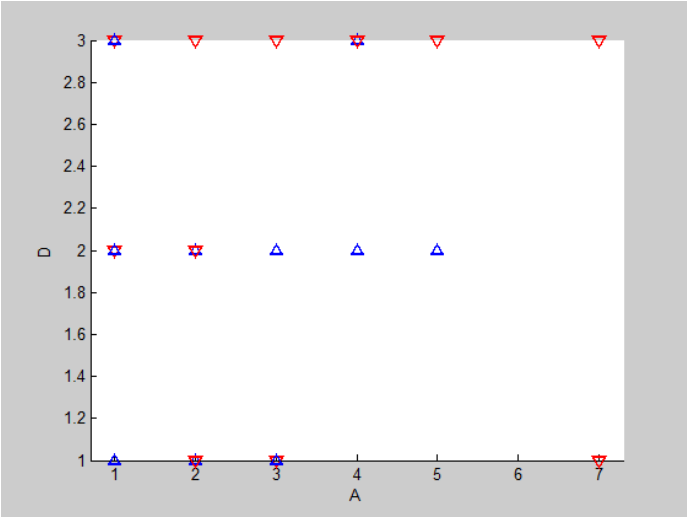

Figure 3. Relationship between Notes receivable and Advance payment by Linear Discriminant Analysis

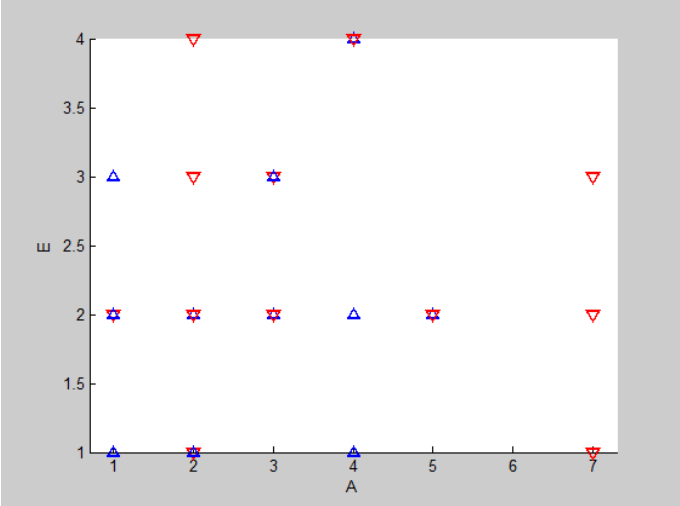

Figure 4. Relationship between Notes receivable and Long-term assets by Linear Discriminant Analysis

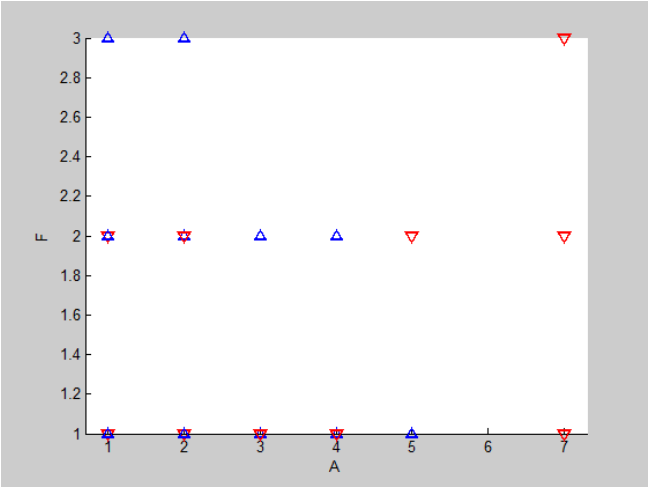

Figure 5. Relationship between Notes receivable and owner's equity by Linear Discriminant Analysis

Table 1. Input data

Elements	Notes receivable	Inventory	Inventory stock and other inventory	Advance payment	Long-term assets	owner's equity
Maximum	5253206	688701	2542277	2521124	17363330	5253206
Minimum	3885	0	0	39	54030	3885
Average	1261087	120072	636372	326940	4689123	1261087
STDEV	1399529	163515	623930	655760	4879249	1399529