AENSI Journals

Advances in Environmental Biology

ISSN-1995-0756 EISSN-1998-1066

Journal home page: http://www.aensiweb.com/AEB/

Strategies to Motivate Replanting Tea Gardens among Tea Growers in Iran

[1]Mahdokht Mansouri Vajari, [2]Iraj Malekmohamadi, [3]Mehdi Mirdamadi

[1]Phd Student Department of Agricultural Development, Science and Research Branch Islamic Azad University. Tehran, Iran.
[2]Professor In Agricultural Extension And Education University of Tehran. Iran
[3]Associat Professor and Head of Department of Rural Development, Science and Research Branch, Islamic Azad University, Tehran, Iran.

ARTICLE INFO

Article history:
Received 11 October 2014
Received in revised form 21 November 2014
Accepted 25 December 2014
Available online 16 January 2015

Keywords:
Renovation of tea garden, tea production, tea growing extension and education

ABSTRACT

Background: This research analyzes the most important strategies in renovation of tea gardens, to increase quantitative and qualitative performance in tea production. As tea bushes are too old in Iran and quantitative and qualitative performance in tea production is declining, it was felt necessary for such a research with a causal relative method to be carried out. 32 experts graduated in agriculture were counted, and out of 75542 tea growers, 383 were selected as the sample based on Cochran formula, using proportional classification method. The means of data collection were questionnaires which were completed through interviews. The research validity was confirmed by Agricultural Extension and Education professors of Tehran Azad University, Science and Research branch, and a number of experts in department of tea and Iran's tea research institute. The research reliability was measured for 89% based on Cronbach's alpha coefficient. Data was analyzed in two parts: statistics and inferential statistics. The following independent variables were effective on the willingness of the tea growers group in modernizing their tea gardens: the aging of tea growers, level of educations, the interest of tea growers to continue cultivating tea, tea growers' motivation, government control and supervision on tea imports, guaranteed price set by government on green tea leaves, government planning methods, improved seedlings production, garden equipment with irrigation system, renovation tools and equipment, distribution of agricultural inputs, coordination of gardens and factories as the two manufacturing sectors, conformity of the garden with renovation operations, provision of technical aids in renovation. In the experts group, these variables were effective on accepting the tea gardens renovation: government control and supervision on tea imports, guaranteed price set by government on green tea leaves, timely distribution of agricultural inputs, and the size of tea gardens.

To Cite This Article: Mahdokht Mansouri Vajari, Iraj Malekmohamadi, Mehdi Mirdamadi., Strategies to Motivate Replanting Tea Gardens among Tea Growers in Iran. ***Adv. Environ. Biol., 8(21),*** *1268-1275, 2014*

INTRODUCTION

Iran is the third major tea consumer in the world. Although Iran is a tea producer itself and the life of a large group of farmers depend fully on this product, every year a great amount of money is spent on tea imports. So solving the problems in this area is obviously reasonable [1].

One of the things that affect the quality and performance of tea production is the condition of tea bushes, which currently are not of good quantitative and qualitative efficiency in genetic and structural aspects. One of the methods used to solve problems of tea growing and increase quality and quantity in production is renovation of tea gardens [2].

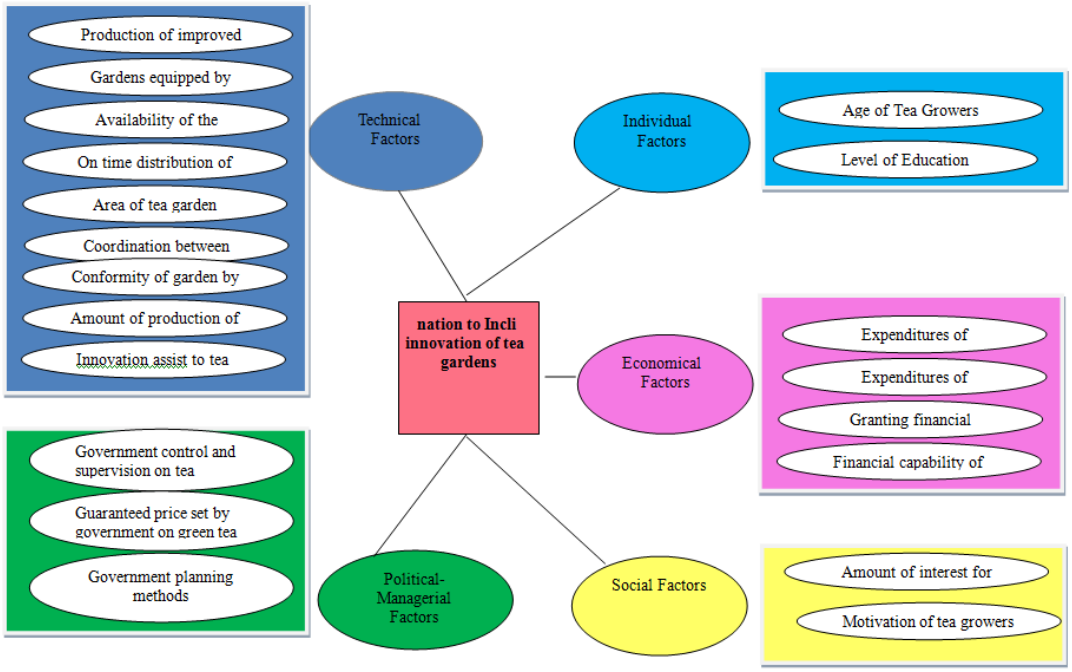
Renovation of tea gardens is uprooting old bushes which have either low or no economic returns, and then replacing them with young and efficient improved seedlings which are more resistant in dealing with climatic conditions, and various pests, and can increase quality and quantity in tea production. As Iran's tea gardens are old and there's no plan for renovation, tea Cultivation and industry will decline if the current condition is not changed. This phenomenon will have troublesome economic and social consequences for tea growers and the owners of tea industry. Thus, studying about renovation of tea gardens as a long-term program in our country is obviously a needed action. The renovation plan has successfully completed in different countries around the

Corresponding Author: Mahdokht Mansouri Vajari, Phd Student Department of Agricultural Development, Science and Research Branch Islamic Azad University. Tehran, Iran.
E-mail: Mahdokht_mansouri @yahoo.com

world such as Sri Lanka, India, Indonesia, Kenya, Nigeria, and China; however, despite the need there has been no research or program on this subject in Iran [3].

Looking at the background of research in other countries shows that in countries such as Seri Lanka, India, China, Indonesia, and Kenya successful results have been acquired in relation with innovation of tea gardens. Meanwhile, there have not been published many written reports in order to indicate the steps for innovation execution in these countries. Tanzania tea organization has pointed out the results of innovation execution of the gardens in some countries in its report in year 2010 and also pointed out the positive effects of the execution of innovation in increasing under-cultivation area , qualitative and quantitative improvement of the products. This report indicates that: Mulindi Cooperative in Rwanda does the renovation and revival of fields under cultivation of tea. The mentioned cooperative renovates 100 hectares of the fields which were ruined in the war of 1994. This renovation includes different stages of uprooting old tea bushes, collecting and transporting them, plowing and clearing the land, preparing pits and demarcating them, transplanting 1200000 tea seedling, protecting and maintaining the renovated area, purchasing and using chemical fertilizers, employing production manager, financial manager, and executive director, and establishing a tea house[4].From 1993 to 1997 some plans were carried out in Nigeria for a comprehensive development of tea, based on components like renovating and extending tea fields from 450 to 850 hectares, extending plantation of quick impact tea from 140 to 400 hectares, strengthening farmers associations in the field of quick impact production. The stages of these plans were postponed till 1997 for political reasons, but a great part of the plan was implemented afterwards. In 1986, after analyzing 25 private properties in west of Java, Indonesia, the renovation plans for tea gardens and tea factories were formulated. Kenya Tea Development Agency which was established in 1964 initiated 5 tea development plans in 1964 and completed them in 1982, through which it extended the area under tea cultivation. Since 1982, this agency has put in priority the plan of filling empty spaces and reforming tea growing, a great part of which is completed [4]. Remberia in a report under title of Kenya Tea Development, which has been published by Iran General Department of Tea Organization in year 2001, pointed out the execution of subsidies increment plans for the new cultivation in Seri Lanka [5].

The main aim of this research is analyzing strategies in renovation of tea gardens in Iran.

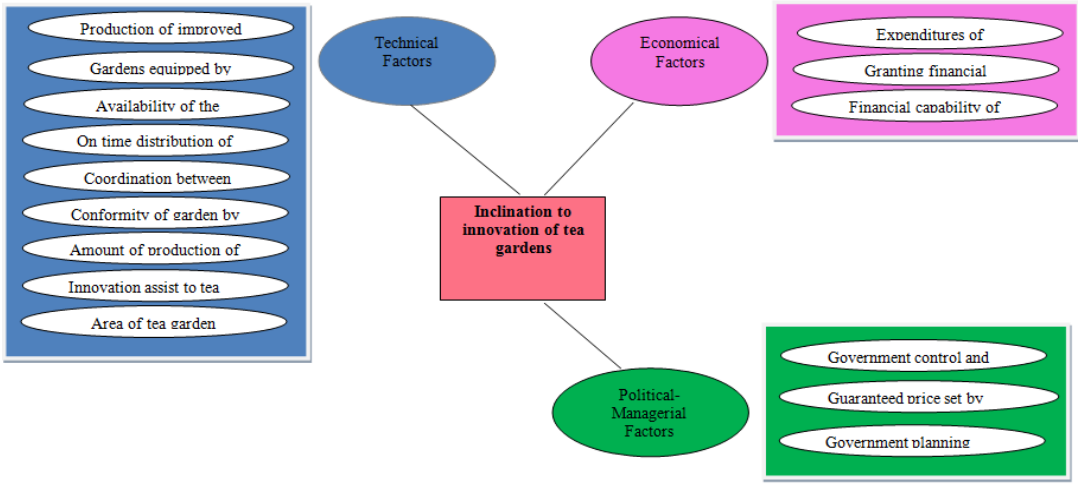


Model 1: General Diagram of Research Theoretical Model and Understudied Components in Tea Growers Group.

Research methods:

In terms of research classification based on purpose, this research is practical. The research method is causal-relative. Population consisted of 75542 tea growers in two tea growing provinces of Guilan and Mazandaran, 383 of which were selected using Cochran formula and with proportional classification sampling method, and it also consisted of 32 experts graduated in agriculture. The means of data collection were questionnaire and interviews. Two kinds of questionnaires were prepared for the two groups of tea growers and experts. The questionnaire used for tea growers had 5 subsections of individual, economical, social, policy-management, and technical factors. The experts' questionnaire had 4 subsections of economical, policy-management, and technical factors, and the factor of tea cultivation and industry problems. The reliability of

questionnaires was measured 89% using Cronbach's alpha. The research validity was confirmed by Agricultural Extension and Education professors of Tehran Azad University, Science and Research branch, and a number of experts in Iran's tea association and Iran's tea research institute. Data analysis was done using descriptive and inferential statistics. The indicators used in descriptive statistics included mean, median, mode, frequency, frequency percentage, cumulative percentage, valid percentage, variance, standard deviation, and coordination coefficient measurement. And in inferential statistics regression analysis was used.



Model 2: General Diagram of Research Theoretical Model and Understudied Components in experts Group.

Findings:

The results showed that the average age of tea growers was 55 and the number of pieces of land they had ranged from 1 to 12. Of the tea growers, 25.3% had high school diploma, 21.4% were illiterate, 15.1% only knew how to read and write, 16.2% didn't have high school diploma, 5% had associate degree, 11.7% had master's degree, and 2.6% had a higher degree.

The results also showed that most of the studied tea growers (85.6%) had not renovated their tea gardens till then. Analyzing the reasons why tea gardens were not renovated, indicate that 35% consider financial inability and lack of knowledge about renovation as most important reasons. About the reasons for unwillingness of tea growers towards renovation, 37.9% considered financial problems, and 16.7% lack of support from government and Iran's tea association as the main reason. 29.5% didn't answer this question. Despite all this, 69.2% said they would be ready to renovate their gardens had the problems been solved. About the willingness of tea growers to change their product, the results showed that 27.7% consider more income as the reason, and 43.9% left this question unanswered. Most of the tea growers (40.7%) stated fruit trees as the first alternative for tea production. About the reason for not using the government's financial facilities, 68.1% (most of them) left it unanswered, and 22.2% thought of late payment of the loan and financial inability for repayment as the most important reasons.

Table 1: Distribution of tea growers according to their features.

Analyzed markers	frequency	min	max	mean	standard deviation
The garden's age	377	2	90	52	13/027
The garden's area (m^2)	373	800	570000	16964/64	53583/368
The number of bushes	360	400	2300000	64191/24	239343/824
The amount of green leaves	356	50	7000	836/85	1105/357
The production per unit area (kg)	375	150	8000	7454/65	5692/382
The price of each kilogram of green	349	2900	54000	4977/79	7930/302
Total amount of product per year (kg)	372	168	600000	16315/3	45827/062
The annual cost of spraying (Rials)	38	100000	2500000	804473/68	799478/537
The annual cost of adding fertilizer (Rials)	366	6500	60000000	1584146/17	640755/097
The annual cost of irrigation (Rials)	23	80000	50000000	10389565/2	18311152/0
The annual cost of pruning (Rials)	365	30000	60000000	4383191/78	15094029/8
The annual cost of workers (Rials)	324	80000	120000000	9596847/53	68054477/3
The annual cost of pest and weed control (1000Rials)	95	100	8000	1405/36	1541612/730
The annualcost of plowing (1000Rials)	195	300	12000	1751/695	6301737/679
The annual cost of harvesting (1000Rials)	335	1000	12000	3436/550	15351270/5
The annual income	344	640	2700000	63172/494	207373524
The cost of re-construction of tea gardens after renovation (1000Rials)	31	200	50000	10047/04	1558938/7
The amount of loan for renovation (1000Rials)	65	900	280000	23911	0/724
The amount of grants for renovation (1000Rials)	29	200	22000	6425	0/850

Resource: Findings of Research

According to the information in the table above, the number of reported cases in some of the analyzed variables – like the annual costs for spraying, irrigation, pest and weed control, plowing, re-construction of garden after renovation – is low. This is because tea growers don't spend on these parts due to their financial problems. The low number of cases in variables of the amount of loan received for renovation and the amount of grants for the renovation of tea gardens indicates that most tea growers don't receive facilities.

According to the ranking of the average renovation advantages of tea gardens from the tea growers' point of view, using coefficient of variation, most of the tea growers consider increase in the amount of green leaves and their quality as the most important advantage. Moreover, most of them consider timely distribution of agricultural inputs like fertilizer and pesticide as the most important effective technical factor in renovation of gardens. 52.6% of tea growers stated that they thought no other tea grower is willing to renovate its garden with the current conditions. The results of ranking the average of different factors' effects on encouraging gardeners to renovate their tea gardens using means show that most tea growers believe that two factors of proper guaranteed price for buying green tea leaves and government's financial aid can have the most effect on encouraging gardeners to renovate their tea gardens.

Table 2: The findings of inferential statistics of tea growers.

Independent Variables	dependent Variables	Test (correlation coefficient)	Test value	Significance level (p)	Result (accepted or rejected)
garden's age	willingness of tea growers to renovate	Pearson	0/233	0/001	accepted
costs of tea production	willingness of tea growers to renovate	Pearson	0/026	0/8	rejected
cost of renovation	willingness of tea growers to renovate	Pearson	0/02	0/6	rejected
endowing financial facilities	willingness of tea growers to renovate	Pearson	105	0/3	rejected
annual income	willingness of tea growers to renovate	Pearson	-0/01	0/8	rejected
the interest of tea growers to continue cultivating tea	willingness of tea growers to renovate	Spearman	0/141	0/007	accepted
tea growers' motivation	willingness of tea growers to renovate	Spearman	0/340	0/001	accepted
government's control over tea imports	willingness of tea growers to renovate	Spearman	0/1	0/05	accepted
guaranteed price of green tea leaves	willingness of tea growers to renovate	Pearson	0/138	0/007	accepted
government's planning for tea cultivation and industry	willingness of tea growers to renovate	Spearman	0/240	0/001	accepted
production of improved seedlings	willingness of tea growers to renovate	Pearson	0/395	0/001	accepted
irrigation system equipment	willingness of tea growers to renovate	Pearson	0/340	0/001	accepted
existence of necessary tools and devices for renovation	willingness of tea growers to renovate	Spearman	0/446	0/001	accepted
timely distribution of agricultural inputs	willingness of tea growers to renovate	Pearson	0/320	0/001	accepted
Area of tea gardens	willingness of tea growers to renovate	Pearson	0/03	0/1	rejected
The tow production units of garden and factory	willingness of tea growers to renovate	Pearson	0/128	0/01	accepted
appropriateness of garden with renovation operations	willingness of tea growers to renovate	Pearson	0/569	0/001	accepted
amount of tea production	willingness of tea growers to renovate	Pearson	0/340	0/001	accepted
giving technical renovation aids to tea growers	willingness of tea growers to renovate	Pearson	0/09	0/07	accepted

The results of the research show that according to the f-test there's a significant relationship between education of tea growers and their willingness to renovate their gardens. The test value is 10.89 and its significance level is 0.001. The respondents with master's degree are the most willing to accept renovation of their gardens. Duncan's post hoc test results determine that those with education (having high school diploma, master's degree, associate degree, and those who know how to read and write) are placed in one group, and those who are illiterate are in another group. This indicates the difference between the two groups in accepting to renovate their gardens. The results of this test are in line with the results of Tea Research of Iran [6].

Moreover, according to f-test there's no significant difference between dispersion of land pieces and willingness of tea growers to renovate their gardens. The test value is 1.4 and its significance level is 0.4. The results are inconsistent with that of Tea Research of Iran [6], Arz Peima [7] and Sanjari [8].

The results of stepwise regression analysis among the group of tea growers show that the independent variables of policy-management and social factors can explain 31% of changes in the dependent variable.

Table 3: The findings of Regression.

P	F	Beta	B	Adgusted R sguare	R sguare	R	
0/001	6/4	_	26/2	0/496	0/472	0/541	(constant)
_	6/4	0/547	0/559	_	_		Political-Managerial Factors
_	6/8	_	35/9	0/410	0/471	0/521	(constant)
0/017	_	0/512	0/478	_	_		Political-Managerial Factors
_	_	0/641	0/521	_	_		Social Facors

$y = Cons\tan t + b_1(X_1) + b_2(X_2)$

$y = 35/9 + 0/478(X_1) + 0/521(X_2)$

The results indicate that the social factors with % 64.1 has the most regression effects on executing the depended variable for tea growers inclination for their garden innovation and the next factor is the political-managerial factors with % 51.2 has the most effects on the depended variable.

The results of descriptive statistics for the group of experts show that, based on the results of ranking average advantages of renovation of tea gardens, most of the experts believe that the most important advantages are tea garden improvement according to scientific and technical principles, increased quality of green tea leaves and the black tea originating from it, and providing the possibility of mechanizing pruning and harvesting. According to the viewpoint of most of the experts, the most important technical effective factors on renovation of tea gardens are production of improved seedlings, irrigation system equipment, and necessary devices and tools for renovating; 75% of experts believe that most of the tea growers are very little willing to renovate their gardens. According to the experts, these are respectively the most effective factors in encouraging gardeners: government's financial aids, guaranteed price for tea, the cost of renovation processes, determining the price of green tea leaves according to its quality, financial ability of the gardener, and provision of technical aids for renovation given by experts. The most important problems of renovation are the amount of government's financial aid, retail ownership of most of the gardeners, and future prospects in the country's tea industry.
Tables 4 and 5 show the findings of inferential statistics obtained from studying experts' group:

Table 4: The results of Pearson and Spearman correlation tests for hypotheses on the experts group.

Independen Variable	dependen Variable	Test (correlation coefficient)	Test value	Significance level (p)	Result (accepted or rejected)
costs of renovation and	willingness of tea growers to renovate	Pearson	-0.14	0.4	rejected
n endowing financial facilities	willingness of tea growers to renovate	Pearson	0.1	0.16	rejected
government's planning for tea cultivation and industry	willingness of tea growers to renovate	Spearman	-0.1	0.5	rejected
production of improved seedlings	willingness of tea growers to renovate	Spearman	-0.008	0.9	rejected
irrigation system equipment	willingness of tea growers to renovate	Spearman	0.01	0/9	rejected
existence of necessary tools and devices for renovation	willingness of tea growers to renovate	Spearman	0.05	0.7	rejected
timely distribution of agricultural inputs	willingness of tea growers to renovate	Pearson	0.4	0.02	accepted

Table 5: The results of c hi-square correlation test for hypotheses on the experts group.

Independen Variable	dependen Variable	Test (correlation coefficient)	Test value	Significance level (p)	Degree of freedom	Result (accepted or rejected)
the government's control over tea imports	willingness of tea growers to renovate	chi-square	13.9	0.007	4	accepted
the guaranteed price of green tea leaves	willingness of tea growers to renovate	chi-square	33.1	0.001	6	accepted
area of tea garden	willingness of tea growers to renovate	chi-square	33.1	0.001	6	Accepted

coordination between the two production units of garden and factory	willingness of tea growers to renovate	chi-square	10.5	0.002	2	accepted
the amount of research on renovation of tea gardens	willingness of tea growers to renovate	chi-square	17/9	0.001	3	accepted
giving technical renovation aids to tea growers	willingness of tea growers to renovate	chi-square	24.5	0.001	1	accepted

Discussion and conclusion:

The assessment showed that the main producers of tea have performed actions to increase their production and exchange income such as innovation, whereas, most Iranian tea gardens plots are small area and scattered and encountered with structural problems. For this reason, the tea growers are encountered with many problems and difficulties which is the main reason for not performing the innovation in their gardens. Meanwhile, to perform innovation, we should:

Select an appropriate place for cultivation, perform pedological tests, select the imported seeds and reproducing them, observe the correct pattern of cultivation, basic design of garden drawings, crop storage operation such as pruning, fertilization, drainage, campaign against pets and weeds, irrigation and plowing.In case of garden innovation and technical changes of cultivation and harvesting of tea, the quality of the produced green leaves of tea will be increased because they are young and suitable chemical compositions have been used and, on the other hand, the resulted dries tea will have higher quality and the possibility of tea mechanization and increasing of tea quantitative performance will be provided and the resulted products will be able to compete with the main producers of the tea in world market.

The main posed techniques are:

1. Concentration on filling the empty places of tea gardens.
2. Performing of pruning for re-juvenile.
3. Paying attention to two factors of Behzarei and Dehnejadi with the centrality of product increment in the area, increase of under-cultivation land and re-cultivation of the destroyed gardens.
4. Establish cultural and educational contexts among tea growers to create motivation and acceptance of their gardens innovation and offering technical services after re-cultivating the seeding up to economical crop time.
5. Asking for help from cooperatives.
6. Creating the close relation between the promoters and tea growers.
7. Granting the necessary facilities to tea growers and insuring their tea products.

It is necessary to mention that because of serious structural problems in the area of tea cultivation and industries in Iran and lack of government protection on this strategic product, a great deal of tea growers do not have interest and motivation to continue of cultivation of this product and in consequence and for the main reasons especially economical problems, they do not make themselves obliged to observe the world standard on tea cultivation and harvest. It is worth to mention that lack of government appropriate lever of supervision on tea imports, has also caused tea growers become motiveless. Annually, a high percentage of tea is imported to the country, legally or illegally, and the internal producers sustain serious impacts.

According to the statistics of North Tea General Dept. in year 2010, ninety one thousand tons of green leaves of tea have been produced in an under-cultivated area of 32 thousands hectares of the State Tea Gardens, from which, 21,000 tons dried tea have been produced, The officially amount of the tea imported to our country has been reported to 81 thousand tons. Whereas various resources have considered 7 rank of the world for Iran on amount of tea imports and mentioned that amount of the imports of dried tea is between 78 to 85 thousand tons. Also, Iran hold the 3rd rank in the world for paying the highest prices to import tea.

These information and figures indicate, in some degree, lack of motivation and interest of tea growers to attempt for technical cultivation of this product and having no inclination on performing the technical and full productivity plan such as garden innovation. Moreover, lack of optimal supervision in tea making factories and lack of granting guarantee prices proportional to expenditures of tea production by the government have caused more problems and difficulties in this subject. It is necessary to mention that there is not any seeding tea garden in our country to produce seed and improved seeding and very limited percentage of gardens are equipped with irrigation system and most tea growers are not able to construct these systems and paying the subsequent expenditures and even, in case of inclination among farmers on innovating their gardens, all of them do not have adequate and necessary tools and equipment to uproot , providing standard cultivation bed, redesign of garden drawings on basic determination of row cultivations, performing the operation of crop storage and harvest or mechanized cutting the leaves and most part of tea growers have many problems with in time receiving agricultural necessities such as fertilizers, poison, pesticides and so on. And in addition to this case, unsuitability of current State gardens by execution of mechanized principles which will be available after innovation and will have considerable effect on increasing of production on green leaves of tea, it is obvious that operating the infrastructure design and multilateral in the domain of tea such as garden innovation, will be

encountered with structural, social, economical, technical and cultural problems and such a problems are the main obstacle in creating motivation among tea growers for applying this change. Without preparation of the required beds for tea cultivation and without measuring the requirement and the situation of various places of tea cultivation and without any attempts to increase logical interaction level between three main groups: tea growers, tea researchers and factory owners, access to deep evolution and permanent development in tea domain of the country will be very difficult and probably impossible and will not have any optimal prospect.

According to information collected from Tea Research of Iran [6] and Tea General Dept. and based on several interviews, the high average of the tea growers age and lack of inclinations of the tea growers to innovate their gardens, have been effective and this result is in contradiction with the results of Kamran [9] and Arzpeima [7] pointed out two factors: interest and motivation of tea growers to continue tea cultivation which this result is in direction with the research findings.

Also, the research results of Yavarzadeh [10] indicated that there is a relation between the government control and supervision on tea imports and the inclination of the tea growers for innovating their gardens and this is in coordination with the research results. Tea Research of Iran [6] and Yavarzadeh [10] pointed out two factors effective in the determined guarantee prices for green leaves of tea by the government and the manner of government planning for tea cultivation and industry which is in direction with the consequences of the research.

Gosh Hajra [11], Dutta and Phukan [12], Banergi [13], Dutta & *et al* [14], pointed out to the important factor of production of improved seeding in their research which this result is in coordination with the finding of this research.

Mirhassani Moghaddam [1], Danesh Vakili [15] and Mirnia and Ebrahimi [16] pointed out the important factor of garden equipping with irrigation system which is in direction with the consequences of this research.

Hassanpour [17] and Farid [18], Aslam Ali and Shahidolzaman [19] pointed out the important factors of distribution of agricultural organization which is in coordination with the research consequences. In addition, Arzpeima [7] pointed out the effective factor of coordination between two sections of the production: garden and the factory, which is in coordination with the research results.

The assessment of the results acquired from Tea Research of Iran [6] is the indication of the effective role of five factors: the amount of tea garden area, offering innovative technical assistance to tea growers, conformity of garden with operation execution of innovation, amount of research performed and the amount of green leaves of tea in innovation of tea gardens and the inclination of tea growers on performing the most important innovation techniques for Iran Tea Gardens in order to increase the qualitative and quantitative performance of tea products.

Suggestions:

1. Preventing tea smuggle and Mafia and creating a tea sale system, creating various products in harmony with the needs of tea market
2. Forming research teams in tea research centres to select and multiply efficient tea seedlings, and analyzing techniques of mass production on them
3. Providing agricultural inputs and help for creating irritation systems through endowment of financial facilities from government (using tea growers' unions and cooperatives by Iran's tea association)
4. Creating garden and factory complexes to produce according to the universal standards
5. Giving multi-stage technical training to tea growers in renovation during the plan implementation
6. Consolidating and renovating tea gardens gradually
7. Developing tea cultivation and industry considering correlation among three groups of researchers, tea growers, and tea factory owners to improve the conditions

REFERENCES

[1] Mir Hoseini Moghaddam, S., 2007. the possibility of turning the lands over Sefid Rood irrigation canal to tea gardens as a garden and factory complex in continuous development of Guilan Province. Food, farm animal and farming science-research magazine, pp: 7-8.
[2] Okhvat, M., D. Vakili, 1998. Tea, Planting, keeping, and Harvesting. Farabi publications.
[3] Deilami Moezzi, Gh., 2009. biochemistry and tea production technology from beginning to the end. aquatics scientific publications, pp: 136-145, 148-151, 154-157, 34, 341.
[4] Tea Research of Tanzania, 2010. Project Description Coopthe Mulindi Tea Plantation Rehabitation Rwanda.
[5] Rimberia, K., 2001. Kenya Tea Development Association (KTDA). Tea Research Association of Iran.
[6] Tea Research of Iran, 2009. Interview With Tea Experts.
[7] Arz Peima, F., 1999. History of tea growing industry in Iran. Iran's tea association publications.

[8] Sanjari, M., 2009. Tea industry development in Iran, perspectives and challenges. Tea Research Association of Iran.
[9] Kamran, S., 2003. Tea: production and advantages. health and food department of Tabriz Medical sciences university publications.
[10] Yavarzadeh, N., 2006. Cultivating organization, Iran's tea industry. Union of North's Tea factories publications.
[11] Gosh Hajra, N., 2007. Tea cultivation (comprehensive Treatise). International Book Distributing Company Lucknow, U.P., 181-212.
[12] Dutta and Phukan, 2004. Notes on Field Management. Tea Research Association Experimental Station, 59-66.
[13] Banerjee, B., 2002. Tea (Production and processing). OXFORD & IBM.
[14] Dutta, *et al*. 2005. Tea Weeds and Their Control. Tea Research Association Experimental Station Jorhat-Assam, INDIA., 190-196.
[15] Vakili, D., 2004. Tea from a scientific perspective. Movassaghi Publications.
[16] Mirnia, S. and R. Ebrahimi, 2003. Tea.Mazandaran University publications.
[17] Hasan Pour, M., 1998. Tea growing and technology. University of Guilan publications.
[18] Mir Hoseini Moghaddam, S., 2003. The instructions on replacing old tea bushes, Iran's tea research services association publications. Tea Research Association of Iran.
[19] Shahiduzzaman and Aslam, 2003. Integrated Management of Old and Young Tea for Maximizing Crop Production. Tea Research of Bangladesh, 15.