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Economic and Climate Feasibility of Olive Cultivation in the Villages of Ize City[1]

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ABSTRACT

Olive is one of the evergreen fruit trees which grows well in Mediterranean areas and also shows good conformity with the areas which are suitable in terms of climate condition. The economic crop of olive is available in warm and semi warm areas where there is no danger of winter severe freezing. Olive plant is resistant to dryness and also 8 gram salt in 1 liter water in irrigation and can bear up to 10 gram in soil and 2 gram salt in 1 Kg soil. Olive grows well in temperate and semi temperate climate and can bear the temperature of -7 to -10 ° C and when the degree is lower than -10°C it will face with frost bite and damages. The amount of annual rainfall should be between 400-500 mm and the optimal amount is between 700-1200 mm. Khoozestan province is one of areas which is fit to cultivate olive and the archaism of cultivation of this plant refers to more than 1000 years ago (the existence of old olive trees which grows wildly and self driven in cities of BaghMalek , Ize , Ahwaz , Masjed Soleyman , Dezfool ,will approve this issue). Among the cities of province, olive was cultivated in Ize city for years which situated in the north east of Khoozestan province. In this article, the economic and c;imate conditions of olive cultivation were studied and confirmed in villages of Ize city by means of SPSS software.
Study method is descriptive survey. Study sample size was selected according to simple random sampling method from villages of region, which were 200 persons from same residents and citizens of villages. Data collection tool was researcher made questionnaire. Number of studied villages were 12 villages which the criteria to select them was according to situational sampling. The criteria to select villages were in 2 forms: first, having relative distribution in whole Ize city so that the possibility to study would exist. Second, villages which were suitable in terms of potential and capacity (economic and climate) to cultivate olive plant.
In each village, the snowball sampling method was used to select olive planting farmers.
By considering climate, study results show that because of similarity of climate condition of Ize city in terms of temperature, rainfall and climate patterns table,.. With semi- Mediterranean conditions, this city is suitable to cultivate and develop olive gardens. In economic analysis, considering the calculation of income – cost amount and calculation of investment for olive cultivation plan for 100 ha and 40 years analysis periods, establishing olive garden is economic.
KEYWORD: olive, economic and climate condition, villages, development, Ize city

1-INTRODUCTION

To recognize each environment and use it efficiently, environmental studies in various fields are needed. In order to achieve safe pattern, it is necessary to follow issue with systematic view. Of course, environmental potentials are not scattered in all places equally and each land has different capabilities in terms of environmental and climate conditions for agriculture and other activities (Parhizgar and Sarmadi, 2001:25). The efficiency of agriculture production is largely related to climate condition. The studying of climate conditions affects on the amount of agricultural products and can help effectively in choosing the best plant species to cultivate. The biggest problem in today agriculture meteorology is the impact of climate factors on products and growth of plant relies on all factors which create an environment (Ali-Zade and Koochaki , 1989:33).

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According to mentioned points, agricultural plans should be based on scientific principles such as climate-economic condition of area. Neglecting above conditions can hurt agricultural products and may result in wasting of investment and decreasing efficiency of resources.

Although we cannot claim that olive(olea europa) is the oldest plant which used in the world, it is no doubt that it considered as one of the oldest plant in Mediterranean areas and particularly middle east (Azizi , 2011:1). Khoozestan province considers as fit area to cultivate olive and archaism cultivation of this plant refers to more than 1000 years ago (the existence of old olive trees which grows wildly and self driven in cities of BaghMalek , Ize , Ahwaz , Masjed Soleyman , Dezfool ,will approve this issue). Among the cities of province, olive was cultivated in Ize city for years which situated in the north east of Khoozestan province (Yoosefi , 2007:105). However in present conditions most of old and traditional olive gardens, although covers wide areas, are marginalized and changed in the form of limited areas and have not significant economic efficiency (Tamoradi et.al, 2009:210). Today, traditional olive cultivating method is not sufficient and the priority should be allocated to scientific and mechanized cultivation.

According to the theory (Chaturvedi,1988:121), since the main purpose of olive cultivation is preparing fruit and oil with best quality and suitable and non competitive price ,the maintaining and making usable the traditional olive cultivation and change them into modern and today cultivating system , like other fruit gardens and vineyards , are applied in such a way that olive planting orchardists are able to harvest, from each hectare of olive gardens , up to 5 times than 1 hectare vineyards, at the same condition.

This article developed to review the climate and economic possibility of villages of Ize city to develop olive cultivation and improve their economic condition and also is looking for following questions:

1- Is there relationship between climate and developing olive cultivation in Ize city ?
2- Is olive cultivation development in villages of Ize city justifiable, economically?

2-Study background:

Most researches about olive in Khoozestan were done by considering water and soil potentials, various areas of province or some of climate elements and factors such as heat , tensions,.. and all climate and human elements and factors were not considered precisely. Also, most researches were done according to agricultural view and tendencies and the geographical views (natural and human) are less considered. For example , 2 significant investigative design in this case were studies about location finding and the feasibility of developing olive cultivation in Khoozestan province according the order of deputy of horticulture affaire of former agriculture ministry and current agriculture JIHAD by consultant engineers (SAMAN AB PAYA) , (HAMOON 1)which were done in 1996 and 2007, respectively. Most of their analysis were done regarding water and soil requirements and the amount of fertilizer for olive plant (Yoosefi , 2007:9). In addition, other researches and works were perform in this regard which are as following:

Tombesi(1996) in the study about olive trees requirements resulted that this plant conforms with various soils and shows more tolerance against salinity of soil rather than other fruit trees.

York George(1979) about suitable place to cultivate olive , believes that this plant normally is cultivated in Mediterranean and tropical areas and various parts of Africa. Healthy olive trees usually produce firstling fruit from third year and in 6-7th year will produce economic fruiting and therefore, production is strictly rely on environmental conditions of plant growth , sapling quality and agricultural management (Sadeghi , 2003:54).

Stebbins Robert (1981) describes that olive is a Mediterranean plant and it will be hurt if the temperature decreases up to -7°C during winter. Materials which are absorbed by olive tree are nitrogen , phosphorus , potash and ferrum. Olive roots release materials which analyze soil and absorb its materials (potash and phosphorus), but, nitrogen is more necessary. In gardens where trees were planted with distance of 8×8 m, the amount of 70 kg pure nitrogen , 60-80 Kg phosphorus ,60-80 Kg potash is necessary (Bartolini, 1994 :303). Study results of Klein Maggie Blyth (1994) shows that olive can adjust with various soils and can grow even in salt soils. Olive is resistant to dehydration and the amount of required water depends on the type of olive , soil , climate of area and the amount of rainfall. In gravel and clay soils and the soil which has lower organic matter and also in areas which constantly faced with warm and dry climate , more amount of water is necessary. Annual consumed water is about 5000-6000 m^3 per hectare (Ha) , but , it should be consider that in early years of cultivation , the need to water for plant is more and during irrigation , water should percolate about 1 m in soil (Gholizade , 1999:54). Yunsa (2003) resulted that olive plant has no sensitivity to the amount of evaporation and transpiration lower than 5 mm, but, if the evaporation and transpiration achieve more than this degree , the plant will need dehydration. Water management plays important role in plant growth. In research of Bianchini and Francesco (1974), it is mentioned that olive plant can grow in soils which drained completely and PH is about 8.5 and have little salt and in warm and dry summers need more irrigation. Olive is high resistance against high temperatures because it has very active roots which exploring the soil deeply and laterally to achieve water. In addition existence of thick cuticle on leaves , resists plant against the heat of air and strong and torrid winds. However , the growth of plant root stops at the temperature higher than 35°C (Mir-Mansoori , 1999:119). The speed of olive plant growth depends on the formed fruits, available water and

temperature of environment. Olive is a yearly tree. Therefore, the amount of formed fruit differs from one year to another (Solinas and Pietro , 1996:238). The amount of water to irrigate one hectare of olive garden changes in terms of soil type and the amount of annual rainfall and in different soils from 6000-7500 m^3 is sufficient for 1 hectare olive cultivation. In areas which the annual amount of rainfall is 400 mm , irrigation in dry months will be need only in summer (Arabi Bikurdi , 2005:12). Mist and hail also affect on olive significantly. Existence of mist during bloom leads to abortion and dropping of flowers. Hail storms wounds the branches and top of branches and also spreading the node disease in olive by bacteria during harvesting products leads to fruit corruption and premature dropping (Stomayar and Delariva , 1994:141). Olive cannot bear non drained or poor drained soils, because it leads to imbalance in 2 elements of nitrogen and potassium, particularly in commercial gardens (Nejad-Sahebi , 2006:97). Existence of old olive trees in Khoozestan province shows suitable environmental condition to cultivate this plant. In most areas of province , the olive plant is scattered. Local types of Bagh Malek , Ize and Dezfool which are endemic olive , can produce qualitative products by proper optimized operation. For example, local type of Bagh Malek and Ize shows higher resistance against dryness than other types (Sadr-Zade,2005,118). In Gilan province , Roodbar city , by economic comparing of olive types , it is revealed that economic types to cultivate are: Manzanilla , Shengeh olive ,yellow olive , Sovilana (Haghighi, 1999 :90). If in cultivating olive, all agricultural operations and conditions will be considered and perform in mechanized and wide area, increase amount of products higher than 6 ton is not unexpected. In addition, because olive tree shows high persistence in terms of age , it affects on increasing production (Bazrafshan , 2006:44). The most important factor of final quality of olive fruit and oil is kind of variety or type. Olive oil features and its amount in fruit and the efficacy of oil extraction , all are affected by olive variety. More than 2000 varieties were estimated in world in which about 100 important commercial types are existed in Italy (Panelli , 2011:378).

3-STUDY METHODOLOGY

Since any geographical research was not performed in philosophic space, will be considered based on philosophic theory , the main approach of present research , is based on realism theory or orientation to review current situation. This study methodology is descriptive – analytical and sample size were selected from villages of area by simple random sampling method(table1) which were 200 persons from residents and citizens of same villages. Data collection tool was questionnaire. The number of considered villages were 12 villages which selected according to situational sampling method. The criteria to choose villages was in 2 forms: first, having relative distribution in whole Ize city so that the possibility to study would exist. Second, villages which were suitable in terms of potential and capacity to cultivate olive plant.

In each village , the snowball sampling method was used to select olive planting farmers.

Table1:Research statistical population

Name of village	Total number of sample population	Name of village	Total number of sample population
Haji Kamal	18	Dehdez	23
Chalisad	27	Rameh Cher	12
Susan	19	morghab	15
Notorki mokhtari	25	Helayjan	24
Notorki Tahmasbi	22	Parchestan	15

Reference: Abbas Maroofi Nejad , field study , 2011

4-Inferential results of study:

4-1: climate feasibility of area to cultivate olive:

In studying the climate feasibility of cultivating olive in region, meteorology and climate information of Ize city such as rainfall, temperature data (min and max average of monthly temperature and monthly average temperature) , sunny hours , relative humidity , evaporation and agrology by means of synoptic station based on at least 10 years statistical period(2002-2011)were considered. Generally, effective climate criteria in planting olive trees and the methods to study which are considered in this study are:

Rainfall:

Rain considers as a factor which has close relationship with the amount of product. In order to achieve good products, water requirements of plant should be provided. Olive tree like other plants needs certain amount of water to grow optimally. If annual rainfall of region will be about 200mm, olive plant will grow, but in order to have optimum growth, some special care such as complementary irrigation is necessary. In regions where annual rainfall is between 300-500 mm, olive trees produce well and when annual rainfall is between 500-800 mm the product can be cultivated in form of dry farming (Sadeghi , 2002:50). In table 2, the average of annual rainfall in Ize city during 10 years period (2002-90) was shown. According to this table, it is clear that minimum water requirement of olive tree is provided and therefore there is no problem in cultivating this plant.

Table2:the average of annual rainfall in (mm) in Ize city station(1381-90)

Dec	Nov	Oct	Sep	Aug	Jul	Jun	May	Apr	Mar	Feb	Jan
117/1	80/5	35/2	14/1	11/2	12/1	20/3	53/1	97/6	59	136/8	63/3

Reference: synoptic climate and meteorology office , Ize city , 2011

Temperature:

One of the features of plants chemical reaction is their sensitivity to temperature. Temperature is one of the most critical elements of plants physical environment and have important impact on their growth, geographical distribution and even their residues. All plants such as olive trees, need certain temperature in order to begin life , growth and evolution. Therefore , studying average monthly temperature , minimum and maximum to define plant temperature adjustment with environment is necessary. Metabolic processes begins by certain temperature and increases by its increasing up to temperature called optimum temperature.

In addition, by increasing temperature up to optimum amount , the metabolic activity decreases and will stop in temperature called maximum temperature. Each plants have its min and max temperature and when temperature go beyond this amount , plant life activity will stop (Jasbersing , 2000 :107). Studying monthly temperature in related area shows that from November , the temperature decreases and in Jan and Feb is in its minimum level and this decreasing of temperature continues up to Mars and then from Apr , the temperature increases. In Jul and Aug the temperature is in maximum level and this circle repeat again.

In table3 , the average of monthly temperature changes in Ize city during 10 years period (2002-2011) was shown.

Table3: the average of monthly temperature changes in terms of (°C) , Ize city station (2002-2011)

	The name of months											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min average	4/7	5	7/3	11/6	16/4	21	24/7	24	19	15	9/5	6/6
Max average	14	16	19	25/4	33	39	41	41/7	37	31	22	17
Temperature average	9/4	10/5	13	18/5	24/6	30	33	33	28	23	16	11/7

Reference: synoptic climate and meteorology office , Ize city , 2011

Olive growth period begins from spring(April) which is called spring awakening. This growth process continues up to winter which consist of plant winter sleep period. During October to March, olive enter winter sleep period and by finishing cold season and increasing of temperature during spring awakening, buds grow. Gradually by increasing temperature and day length , corymbs will be created and developed. Blossoms will emerge in May and June and fruit will grow immediately after creation. At the end of July and early August, during hardening of core , another stage of coarsening of fruit begins in terms of type and up to September and November it will achieve its maximum size. The end of plant vegetative season is concurrent with beginning of winter season. After finishing sleep period , annual growth circle will repeat again. Olive plant is sensitive to temperature and can bear maximum temperature of -12 °C (of course when the coldness because of temperature drop was not continues and sudden). If we refer table 3 , we can observe that minimum average of monthly temperature at the coldest month of year , was not lower than 5°C. in order to have precise study , the average of min and max temperature had been considered.

Chilling requirements and sunny hours:

In each plant , after vegetation and procreation activity , when the temperature goes lower than biologic zero , life activity decreases and lead to winter sleep or rest , and in fact in this stage of life activity , plant needs some coldness to rest and it is considered as a ground to start vegetation and procreation activity and specially stimulates flowering. Plants chilling requirements measure by sum of hours in terms of period in which temperature achieve to plant minimum threshold until achieve temperature to biologic zero (Mohammadi Danesh Vakilli,2006). According to minimum critical temperature for olive plant which is -10°C, chilling requirement is related station was estimated on this basis (table4). The results of present study show that the chilling requirement for olive tree id different between 200-1200 hours and in studied regions this chilling requirement is provided.

Table4: estimated chilling requirement in studied station

The name of station	**Ize**
Chilling requirement	511/8

Reference: synoptic climate and meteorology office , Ize city , 2011

Olive is one of trees which needs a lot of sun shine and necessary light for olive is more than 1500 hours sun light in year. The light between 1000-1500 hours is considered as low light condition. In this situation trees become forestall and the crop decreases and the fruiting limited only to outer surface of tree top. The light lower than 1000 hours in year is not enough for growing olive tree. Olive tree needs 1500-3500 hours sun light in year (Darvishian, 1997:125). According to 10 years statistics (2002-2011), the number of sunny hours in year are 3029/4 hours and the

average number of sunny hours in Ize city are 252/4 hours sun light in one month. In table5 , the number of sunny hours of Ize city during 10 years period (2002-2011) was shown.

Table5:the number of annual sunny hours in Ize city (2002-2011)

	year									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
the number of sunny hours	3129/7	3021/3	3252/8	3095/6	3029/4	3100/1	3083/9	2861/4	3110/6	3041/7

According to table5 , Ize city has suitable sunny hours to cultivate olive and so in this field it is not considered as limiting factor.

Relative humidity:

High humidity of atmosphere affects significantly in terms of two point of views: first, can absorb humidity from around saturated air largely. Second, humidity is effective on plant photosynthesis. Most plants grow well in high humidity condition of atmosphere (Jasbersing , 1999:117-118). The threshold of optimum humidity for olive growth and annually efficacy is between 40-50%. Relative humidity higher than 70% leads to disruption in olive plant growth (Sheykh Ahmadi , 2005:81). In table6, the average of annual relative humidity of Ize city during 10 years period(2002-2011) was shown. We can observe that the most amount of relative humidity is in 2006 with the average of 45/1 and the lowest is in 2011 with the average of 37/3. Generally, relative humidity condition of area is suitable to cultivate olive and relative humidity is not considered as limiting factor for cultivation.

Table6:the average of annual relative humidity in Ize city(2002-2011)

	year									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
The average of relative humidity	44/5	40/7	43/8	40/6	45/1	40	40/5	42/4	38/4	37/3

Reference: synoptic climate and meteorology office, Ize city , 2011

Agrology:

Although olive tree is compatible with wide range of soils, it shows most performance in soils which can spread its roots without any physical and chemical limitation. Generally, the proper depth of agricultural soil for each tree must not be lower than 1-1.5 m. even very special poor soils can be used by olive, too. Until the amount of salinity in soils is lower than 2.7 ds/m (2.7 ds/m >EC) , there is no decrease in performance (Sadeghi ,2002:220)

When there is enough water for irrigation , olive produces sufficiently in various soils , but , suitable soils for olive plant are light gravel and clay soils with alkaline reaction (PH= 7/1 -8) and enough drainage (Mir Mansoori , 1999:23). In this regard, agrology features of Ize city were shown in table 7 , after studying.

Table7: PH condition of soil in Ize city

Soil depth(cm)	pH
0-30	8
30-70	8
70-125	8/2

Reference: JIHAD agriculture office , Ize city , 2011

Generally, considering performed studies, it can be resulted that the soil of Ize city is suitable to cultivate olive tree, in terms of pH.

4-2:Economic feasibility of region to cultivate olive

According to collected data and statistics from 6th country general population and housing census in 2006, from whole population of Ize city which were estimated 195018 persons , 86786 persons live in villages(44/5%) in which from this population , 22168 persons are in age group of 0-14 years old and 52280 persons are between 15-64 years old and 4902 persons are at the age higher than 65 years old. Therefore according to dependence coefficient index , per every 100 persons of active population in villages of this city, 52 persons are inactive. Since among 10 province of country which had highest unemployment rate according to 6th country general population and housing census in 2006 , Khoozestan province ranked in 8th place(19/30%) and therefore unemployment rate in rural areas is higher than urban areas. Ize city among cities of Khoozestan province has higher unemployment rate and so its villages , too, which this number was 27/8% in 1385. Totally, 14534 unemployed persons exist in villages of this city.

According to field observation and performed estimation, every investment on olive cultivation is justifiable and would involve economic efficiency. About harvesting and revenue for olive planting orchardists in villages of this area, following information were acquired:

Minimum olive harvesting from each tree in some studied villages were 10 Kg and the Maximum harvesting were 20 Kg. regarding that in each hectare , there are 204 olive trees , averagely, and the min and max olive harvesting in each hectare is 2040 and 4080, respectively. Also consumed expenses (labor, fuel, irrigation, seed, poison, fertilizer) per each Kg of olive was estimated between 400-450 tomans. In other word, total cost for 1 kilo of olive for each olive planting farmer in this area is between 400-450 tomans.(the portion of expenses : 26/60-30%). The main selling of olive for orchardists, for 1 kilo is about 1500 tomans , therefore , net profit for each kilo in one cultivation season is between 1100-1050 tomans. Each hectare include 2142000-2244000 tomans for minimum harvesting and 4284000-4488000 toman for maximum harvesting in which in this study maximum level of costs(30%) were considered. But since government has no guaranteed price for this crop and in other hand since there is no marketing for this product , dealers offer this product up to 3500 tomans per 1 kilo to wholesalers in form of canned which for domestic consumer of province market , it was sold 4500-5000 tomans for 1 kilo.

4-2-1:Studying and measuring investment on developing olive cultivation in the villages of area:

According to study of area about watering plans and regarding executive costs and balancing estimations in terms of price per day , it is inferred that in order to provide water in related areas, the costs of installation each hectare of olive garden including water pumping or pitting and mobilization and establishment of transmission lines , creating balanced tanks and water distribution networks in garden (under pressure-drip irrigation system) and also construction olive garden such as costs of primary leveling of ground(partial and incorrect leveling), pitting , buying sapling and plants and cultivate plants are averagely 10000000 tomans. Now, we consider a garden in form of several closed parts about 100 hectare area.

The costs and revenues estimation are as following:

a- Costs(in millions)

Buying 100 ha land: each ha:17500000 tomans =1750000000

Regarding field study in some villages in region , farming land is announced between 1500-200 tomans in m^2 which we consider 1750 tomans per m^2 , averagely.

Investment to build olive garden in 100 ha (according to information from farmers of region per each ha in year)is 2500000 tomans, therefore =250000000 tomans.

Annual personnel costs (for every 3 persons)=18000000

Total costs of annual fuels to pump water with 6 inch diameter=6360000 tomans

About irrigation and decreasing its costs, above mentioned estimation were considered without government grants and bank loan. For example, in order to mobilize and install under pressure irrigation in gardens in 1390, the government approved to provide 85% of costs in the form of grants for farmers and the 15% of rest will be offered in the form of loan by introducing them to agent banks with interest rate of 14%.

Therefore total number of costs is estimated 2024360000 tomans. It should be mentioned that about 5000-6000 m^3 (5-6 million liter)water are consumed for each hectare of olive gardens in year.

b- Revenues(in million tomans)

In conditions which water is provided in sufficient amount and with under pressure irrigation system and regarding favorable climate conditions and natural location of region and also, observance of agricultural principles , it will be expected that in most ideal condition it can be possible to increase olive production at least to 6 ton or more per hectare. But, now after performed studies about crop harvesting and acquired revenues , following information were achieved:

Regarding the price of 2011of this crop in current studied regions which were at least 1500 tomans per 1 kilo , by wholesale, the revenue of 1 hectare olive cultivating is : $1500 \times 6000 = 9000000$ tomans

If we consider the costs of cultivating , preserving and harvesting , 30% , constantly , the net income per hectare olive cultivating will be : 9000000×70% =6300000 tomans

And the net income of 100 hectare will be :6300000×100=630000000 tomans

According to this economic estimation , it is observed that olive development plan is very effective and regarding to mentioned condition , the acquired interest of this plan is completely apparent and certain. In addition , there are other factors which result in more profitability which consist of :

1- To expect increase in product up to 6 ton and more , because all developed agricultural operation and conditions were considered. In addition , by increasing the age of tree which continues several years , the product will increase.(Bazrafshan,2006:44)
2- Increase in product costs in future years is imminent according to the process of similar products or global rates
3- As it was said, olive gardens have life time more than what is expected and their value increases by passing time. But, normally, the effective life time of garden and irrigation installation and… which generally called amortization life is averagely 40 years in whole garden, because , it is obvious that the life time of

tree in garden is more than several centuries , but , since infrastructure installation such as installation for irrigation , pipelines , tanks and building have limited life time which is lower than garden itself. In order to show estimated results, the effective life time of complex was considered 40 years (Gholam Shahbandi , 2006:91)

4- Social and economic impacts of this plan for this region because this issue resulted in improvement and employment and increasing people life level.

4-2-2:Estimation of annually investment allotment to build 100 hectare of olive gardens in villages of region:

According to economic formula (L.D Schall and C.W. Haley :1985) in order to build an olive garden in 100 hectare in defined villages of studied region, table 8 was shown:

Table8: annual investment portion to build a 100 hectare olive garden in villages of region

description	amortization	Fixed capital(tomans)	Annual portion with the interest rate of 14%(tomans)
Building and operating 100 hectare olive garden in region	40 years	2000000000	281456249
Annual personnel cost	-	-	18000000
Total cost of annual fuel(tomans)	-	-	6360000
Total number of annual portion costs(tomans)			305816249

Reference: Abbas Maroofi Nejad , field study , 2011

Economic formula to measure the amount of investment:

$$A=P\frac{I(1+I)^n}{(1+I)^{n-1}}$$

A: fixed annual investment portion
P:primary investment
I:interest rate(14%)
n : number of years(40 years)

4-2-3:Estimation of ratio of interest to costs to build 100 hectare olive garden in studied region:

The ratio of interest to costs and revenues with interest rate of 14% to build 100 hectare olive garden in defined villages of studied region was shown in table9:

Table9: the ratio of interest to costs to build 100 hectare olive garden in villages of region

description	Interest rate of 14%
Pure annual income per hectare	630000000
Annual cost portion	305816249
Ratio of interest to cost	2

Reference: Abbas Maroofi Nejad , field study , 2011

Therefore, it can be observed that the ratio of interest to cost in terms of considered numbers is 2. Now, if we suppose that the price of selling olive is fixed and costs are doubled, we will achieve this results that building this gardens will make enough profitability , while according to above estimation , the interest rate of 14% was considered in which regarding to government facilities and aids is very lower than these numbers.

4-2-4:Using SPSS software to evaluate the relationship between rural economy and olive cultivation in studied region;

In order to review the relationship between rural economy and olive cultivation development in studied region, descriptive – analytical study was done and a questionnaire consists of 22 items and SPSS software were used. Sample size was selected according to simple random sampling method among villages of region which were 200 persons from residents of the same villages. To select villages, situational sampling was used, in other word, villages were selected that were suitable in terms of potentials (natural , human) to cultivate olive. In each village, snowball sampling method was used to select olive planting farmers. Therefore, followings were extracted which finally approved the direct relationship between rural economy and cultivation and development of olive in villages of region. In order to approve this relationship, Parametric Pearson coefficient test was used. On this basis, in table 10 and histogram 1,2 , it can be observed that there is significant relationship between olive cultivation and rural economy at the level of $\alpha=0.05$($sig<0.05$). Therefore, there is direct relationship between improvement in rural economy condition by cultivating olive plant in villages of region. Also, regarding the positive amount of significance level , it can be resulted that there is positive significant relationship between olive cultivation and rural

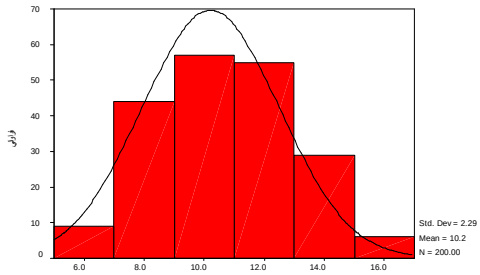
economy ,i.e , by increasing the amount of olive cultivation , rural economy will improve and by decreasing the amount of olive cultivation rural economy will decrease.

Table10: Pearson correlation coefficient test table to study the relationship between olive cultivation and rural economy in region

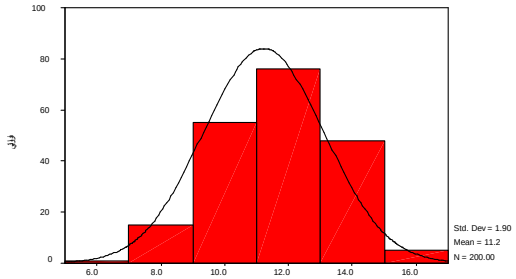
variable	Pearson correlation coefficient	Significance level
The relationship between olive cultivation and rural economy	0.146	0.006

Reference: Abbas Maroofi Nejad , field study , 2011

Histogram1: correlation coefficient by supposing that variable of rural economy is normal



Histogram2: correlation coefficient by supposing that variable of olive planting is normal



About the problems of olive planting farmers in Ize city , and regarding the study population , whole issues are mentioned in table11. The most issue with 24% (48 persons) is related to the lack of transformational and complementary industries in region(24%) and the lowest issue with 6.5% (13persons) is related to the lack of allocating long term loans with low interest to farmers in order to develop this product.

Table11:the frequency of problems of olive planting farmers in villages of studied region

The problems of olive planting farmers	frequency	percentage
Lack of government guaranteed buying of this product	30	15
Lack of transformational and complementary industries in region	48	24
Lack of farmers knowledge about scientific and commercial cultivation of this product	43	21.5
Lack of allocating long term loans with low interest for farmers to develop this product	13	6.5
Lack of allocating on time and necessary agricultural requirements(poison , fertilizer , seed ,..) to olive planting farmers	14	7
Lack of enough water in region	27	13.5
Lack of providing insurance for olive product by related authorities during one cultivation term	25	12.5
sum	200	100

Reference: Abbas Maroofi Nejad , field study , 2011

5- Conclusion and recommendations

Regarding the issues mentioned about the conditions and features of olive and its adjustment with natural and human features of villages in Ize city , it is revealed that conditions of region is suitable to cultivate this product in terms of climate condition. Economically, by considering performed estimation and field study of statistical

population , economic justification to cultivate and develop this product, was confirmed. So, according to achieved results, following recommendations were presented:

1- Marketing and public relation: the most important issue in marketing and public relations in the field of global economy is the issue of mutual relationship with other countries. There is a theory in economy which says: advertizing is half of business and merchandize. So, our country should have representative in all fields of agriculture, internationally and our agriculture products will advertise all over the world and motivation to buy should be created in buyers and their orders will be received and collected. Even, when we cannot produce one product, we should promise for purchase order with producer countries and perform as dealer , like the job was done by UEA, china, turkey,..

2- In order to make active and dynamic urban and rural economy of every country, the most important factor is the attention of country government and governors to economy because any work cannot be done without pay attention to economy.

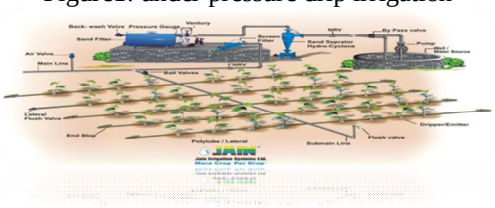
3- Performing research projects and finding location plans rely on precise climate studies, agrology… in order to find suitable places to develop olive gardens.

4- Preparing experimental and exhibitive farms to complement performed studies and encouraging farmers to cultivate olive under the supervision of investigative centers.

5- Using suitable and compatible variety with climate condition of region and types such as Conservallia and local types of Bagh Malek and Dezfool,..

6- Also, management of irrigation can solve most problems of possible lack of water and drought in region, although only using of one method for irrigation is not correct and choosing most suitable method for irrigation is relied on environment geographical conditions. for example, for olive cultivation , the irrigation methods such as under pressure drip irrigation system is suitable (figure1)

Figure1: under pressure drip irrigation



7- Developing security for agricultural products and facilitating insurance for gardens were damaged by climate changes (chaturredi,1988:88)

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