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Discussing the effects of the date cluster necrosis on economic and social conditions of farmers

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ABSTRACT: Dates are one of Iran's tropical and subtropical products, which enjoy great importance in the country's exports. This important and strategic product has been caught by cluster necrosis in recent years, which has greatly damaged the palm groves, farmers and the economy of the region. Many parts of the country, where dates are raised are affected by the disease, particularly the Kerman province. This study investigates the effects of this phenomenon on employment, income and investment in agriculture sector as well as migration and food security of rural households. To carry out this study, besides a conceptual framework , the required data were collected through rural partnership meetings and group interviews and they were analyzed using different methods of descriptive and inferential statistics. The results show that generally the income level of date raisers has significantly decreased after date cluster necrosis occurred and the amount of investment in the agricultural sector was reduced. The region's palm grove less than 2 hectares have been phasing out of agricultural activities and the gardens more than 2 hectares are getting smaller day by day. Given that date is a mono-product in the region, raising date is still the main occupation of the household breadwinners in the aftermath of date cluster necrosis but with a far less the percentage. The impact of the date cluster necrosis on the permanent withdrawal of labor from the agricultural sector and rural migration has been very low.

Keywords: migration, employment, investment, date cluster necrosis disease

INTRODUCTION

Agriculture sector should be paid attention to as an important part of the country's economy more than other areas due to its many natural benefits and also the critical role it plays in the society's food security. The gardening sector is one of the important subdivisions of the agricultural sector, so that it owns 33% of the value added, 47/8 % of exports and 78/4% of the value of exports in the (Horticulture Department of the Ministry of Agriculture 2013). Unlike farming sector in which crops models are defined annually, the gardening sector requires a horizon for planning, because this sector needs muli-years investment to come on stream.

There are 5 palm producing countries in the world which are the main producers of dates. Egypt ranks first with 1 million and 113 thousand tons production per year, Iran ranks second by producing one million tons annually, and Saudi Arabia ranks third producing 755,500 tons of dates each year (FAO Stats), but currently Iran is in a precarious position amid a decline in production in the last two years and consequently a decline in the relative advantage in terms of production and exports. According to studies, date is a product which enjoys comparative advantage in terms of production and exports, but given the calculating base of the comparative advantage which is the production costs, the index is not stable and it suffers a decreasing trend by an increase in the production costs. In such conditions, the decreasing trend of comparative advantage of production and exports continues by the vicious cycle of increasing production costs inside the country as well as other factors to which a decline in production rate in each hectare should be added so that Iran having been ranked first in terms of under-cultivation surface in the world ranks forth in terms of performance (tons per hectare) (Shafi'i 2012).

Iran currently cultivates and produces dates in 15 provinces among them Kerman with 19/79 percent, Khuzestan with 15/14 percent, Sistan and Baluchestan with 15/06 percent, Bushehr with 13/47 percent, and Hormozgan with 13/08 percent are top producers which involve the country's total date production. This generally constitutes two-thirds of the country's dates production.

The highest area under cultivation is in the Sistan and Baluchestan province and Khuzestan with 37,452 hectares under cultivation, Bushehr with 36,934 hectares, Hormozgan with 34169 hectares, and Jiroft with 30797 hectares are the next in terms of the area under dates cultivation (statistics taken from the Ministry of Agricultural Jihad site). Statistics about the production of dates between the years 2001 to 2011 show that the decline in production occurred in the years 2006 and 2008. In 2006, the production rate has declined by 0/7 percent compared to 2005 and in 2008 too the production rate declined by 4 percent compared to 2007. The decline in production happened due to various reasons (Statistics by the Agricultural Jihad Organization of Kerman Province).

Dates cluster necrosis has been the country's palm producers most important problem in recent years. The dominant, very important and commercial brands in these areas, such as Mazafati in Kerman, Mordarsang in Hormozgan and Kabkab in Bushehr, Khasi, Kabkab in Esta'amaran in Khuzestan have been severely damaged by the condition. According to reports, the average pollution has been estimated at 86 percent and 55 percent in Kahnuj and Jiroft regions respectively. The statistics show the vast amount of damage (Statistics by the Agricultural Jihad Organization of Kerman Province).

Kerman province is one of the favorable areas of the country within which gardening enjoys a natural advantage. According to the province's agricultural products stats an area of 312,655 hectares has been under cultivation of gardening products during the years 2011 and 2012. Pistachios, dates, almonds, walnuts are ranked first to forth with the areas under cultivation of 188562, 36971, 8254 and 8709 hectares respectively and the production about 252,537, 98373, 10160 and 7788 tons, respectively. Based on the latest statistics published by the Ministry of Agricultural Jihad in 2012 more than 238,000 hectares of arable land is allocated to raising dates and its varieties in the country and the Kerman province has allocated 26, 997 hectares or about 10/5 of area under date cultivation in Iran and the Iranian city of Bam with 23,000 hectares devoted to palm groves is one of the most important areas for date production in the province.

Dates cluster necrosis as a physiological phenomenon has severely affected the province's date production for several years now. According to statistics provided by the city's management of Agricultural Jihad, the damage caused by the date cluster necrosis in a 21500 hectares area in the cities of Bam, Reagan and Fahraj is estimated at 200 billion riyals. The damage inflicted on the city of Bam, Reagan and Fahraj in an area of 12,000, 4,500 and 5,000 hectares respectively was estimated at 40, 75 and 65 percent, which indicates the magnitude of the disaster and its impact on the economic situation of farmers (income level, living conditions, education, the amount of debts and loans) and the province's economy (unemployment, increased migration, and fall in exports). The scale of the disaster will be greater when its effects on different levels is shown numerically so that an appropriate strategy is provided to to reduce its impacts. In this research, a qualitative method of Rural Participatory Estimation was used. Using targeted sampling a number of farmers and key informants were selected and using group discussions and semi-structured deep interviews in the area the impacts of of date cluster necrosis on the social and economic situation of the region and farmers were investigated. Also the required information were collected using documentary techniques in this study and by referring to the relevant organizations.

Table 1: Area under cultivation, production and dates product performance in the world.

Country	Production(ton)	Rating	Area under cultivation (hectare)	Rating	Performance	Rating
Egypt	1130000	1	23500	6	33731	1
Iran	1000000	2	240000	1	4166	4
Pakistan	500000	5	85000	5	5882	3
Saudi Arabia	982546	3	155734	3	6039	2
Emirates	755000	4	1876000	2	4059	5
Algeria	500000	5	155000			

RESEARCH BACKGROUNDS

Abdollahzadeh in a study entitled "Assessment of economic, social and environmental consequences of development" has studied the economic, social and environmental impacts using questionnaires and interviews. The implications of the impacts and consequences of tourism have been prioritized based on the coefficient of variations in various aspects.

The results showed that the economic impacts of tourism include issues such as providing new employment or business opportunities for local people, creating new markets for agricultural products and local production and increasing the expenses of people in rural areas. Social impacts also include cases such as creating problems of congestion for local residents, the loss of traditional and local culture and, the rise in social offenses.

Anabestani and Hajipour have examined the social and economic implications of conductive projects in rural settlements. The research method is applicable in terms of the objective and experimental in terms of methodology. To collect data, field studies and documenting have been used in this paper. The results show that there is a correlation coefficient between the variable of the impacts of implementing conductive projects and creating economic changes in the lives of the villagers. From among different variables, rural service delivery by a factor of 53 percent impact coefficient has had the greatest influence on social changes in rural areas. There is not a significant correlation between the variable of the impacts of implementing conductive projects and creating economic changes in the lives of the villagers. According to the findings, executive strategies are recommended to fully implement projects and take advantage of local bodies in their implementation such as institutional and legal capacity building in order to facilitate and increase public participation of villagers, paying due attention to natural and human capabilities and capacities in rural areas, the allocation of adequate credit and financial CME programs in order to complete the implementation of projects and the use of local inputs.

Yazdani *et al.* wrote an article aimed at assessing the implications of watershed management projects on the economic and social dimensions of the lives of farmers and studied the effects using qualitative methods. The main variables of the study included: social variables such as immigration, employment and local participation in planning and economic variables including flood control, reclamation, production and prices. Correlations between variables were determined based on their value and importance through statistical analysis of the data. The results showed that the scheme has been very successful in increasing the area under cultivation and thereby production and farmers' income have also increased.

Saleh and Mokhtari conducted a research aimed at investigating the economic and social effects of the drought on employment, income and investment in agriculture sector as well as migration and food security of rural households in the Sistan region. They took advantage from a conceptual framework, as well as a measurement survey and the household questionnaire and relevant experts to carry out the study. This study shows that the drought had a very low impact on the permanent withdrawal of labor from the agricultural sector. On the other hand, many households have lost their income from the agriculture sector and the sector has experienced a reduction in the rate of investment. To improve accountability and action against drought and to reduce the damage, basic measures are recommended such as infrastructure development and related investments, development of water reservoirs, as well as reform of decision-making procedures, decentralization and the strengthening of non-governmental organizations.

Derikvandi has studied the impact of this development on improving literacy, employment, incomes, reducing rural migration and reducing the use of forest fuels. For this purpose, a quasi-experimental research method has been used and information was collected through a questionnaire (villages and households) on the basis of documents. The results show that this scheme has been effective both in improving employment and the other cases.

Karampour et al. have presented a report based on which the date cluster necrosis has been seen for the first time in the Ghale'e Ganj and Roudbar regions of Kahnouj city in Kerman province. Since the highest area under cultivation of the Mazafati date is located in Jiroft and Kahnuj regions, the greatest damage has been reported to this brand.

Pirou et al. has studies the social and economic factors affecting rural participation in PRA watershed management schemes (Fars province). In their study, they were faced with the presentation of the PRA project by the comprehensive management of participatory watershed during the process of implementing villagers' participation. According to the villagers' role in the implementation of the Participatory Rural Appraisal (PRA) scheme or the assessment of villagers' participation the socio-economic factors affecting the adoption of participation by the villagers should also be mentioned. Thus, in this study, it was tried to examine some social and economic factors affecting rural participation in the PRA project. Therefore, the required data were collected during the research using library studies and measurement. Then the collected data and the research's hypotheses were analyzed using SPSS software and statistical methods (descriptive and inferential) in order to achieve the general and detailed goals of the research.

The results showed that the contributions of rural people are affected by a number of demographic, social and economic variables (age, sex, education, income, religion and mass media) and then practical solutions and appropriate recommendations in line with cultural patterns in Fars province were provided using the results of the study.

MATERIALS AND METHODS

The qualitative assessment of rural participation (Participatory Rural Appraisal PRA) method was used in order to achieve the objectives of the study. Since this study is aimed at analyzing the socio-economic impacts through rural participation method and there is a need for the relations between variables to be examined, therefore the study is an applied and descriptive and analytical content analysis, in partnership with field observations and analytical and comparison methods.

In this study, the descriptive and inferential statistics by SPSS software and a rural assessment has been used after collecting and classifying the data. To describe the variables of the research, statistical characteristics such as frequency tables, frequency percentage, cumulative frequency, mean, median, mode, standard deviation, minimum and history are used.

To carry the study, first a number of the region's farmers and key informants were selected using a targeted sampling and then the chosen group helped to carry out the group interviews. The statistical population of the study consisted of all farmers of palm groves where the date cluster necrosis has been reported and in the city of Jiroft they include municipalities of Ismaili, Hossein-Abad, Dolatabad, Halil, Mardahak, Aliabad, Islamabad, Jihadabad and Anbarabad. In the city of Bam, Reagan and Fahraj suffered the highest rate of date cluster necrosis. With reference to the above mentioned municipalities and a group discussion and individual interviews, the required information was collected in each region. In order to take advantage of the views of the experts of Agricultural Jihad Organization, the cities' Agricultural Jihad managements, local informants, Agriculture Bank and Rural District Council were interviewed. In this study, 268 people of date farmers in each damaged village (Table 3) were studied and to describe the variables of the research, statistical characteristics were used such as frequency tables, frequency percentage, cumulative frequency and comprehensive frequency.

The respondent group included 30 people from Ismaeli village, 20 people from the village of Hossein-Abad, 25 people from Dolatabad, 25 people from the village Mardahak, 30 from the village of Aliabad, 22 people from the village of Islamabad, 24 people from the village of Jahadabad, 32 people from the village of Anbarabad in the city of Jiroft, and 30 from the village of Reagan and 30 people from the village of Fahraj in the city of Bam.

Table 2: The percentage of pollution in 10 villages.

City	Village	Pollution (%)
Jiroft	Ismaeli	48
	Hossein Abad	40
	Doulatabad	50
	Halil	45
	Mardahak	44
	Aliabad	45
	Islamabad	55
	Jihadabad	35
	Anbarabad	45
Bam	Reagan	75
	Fahraj	65
	Barhamabad	70
	Hossein Abad	80
	Qaem Abad	78

RESULTS AND DISCUSSION

The Profile of households studied: Table 3 shows the statistical characteristics of the studied gardeners in the region. The Average, minimum and maximum number of children in the households studied has been 6/7, 2 and 13 respectively with a standard deviation of 8/1, which according to the mean value shows a very low dispersion of observations around the average. Farmers studied have low education levels. The mean value of this variable is 1/88 years that constitutes a relatively substantial dispersion around the mean. This result is linked to the age of the farmers who are often very old.

Table 3: Some characteristics of the gardeners studied.

Standard deviation	Mean	Maximum	Minimum	Scope	Number of cases observed	Variable's name
1/81	6/65	13	2	11	268	Number of Children (people)
2/43	1/88	12	0	12	268	Education level (year)
13/68	51/9	87	20	67	268	Age (year)

Gender. In terms of gender, 260 people (97%) of farmers were male and 8 people (3%) were female.

Table 4: Distribution of farmers by gender.

Cumulative percentage	Percentage	Frequency	Gender
97	97	260	Male
100	3	8	Female
-	100	268	Total

Marriage. In this study, 225 people (87/6 percent) of farmers surveyed were married and 33 people (12/4 percent) were single.

Table 5: Distribution of farmers based on marital status.

Cumulative percentage	Percentage	Frequency	Marital status
87/6	87/6	235	Married
100	12/4	33	Single
-	100	268	Total

Age. In this study, 25 people (9/3%) of the surveyed farmers were between 20 and 30 years old. Those people between 51 and 60 years, 81 people, constitute the greatest number (30/2%) and those between 41 and 50 years, 61 people (22.7 per cent). According to the research, farmers over 50 years old constitute 51.8 percent of the best farmers which means the region's farmers are of old age.

Table 6: Distribution of farmers based on age (years).

Cumulative percentage	Relative percentage	Frequency	Age group
9/3	9/3	25	20-30
25/3	16/04	43	31-40
48/04	22/7	61	41-50
78/24	30/2	81	51-60
100	21/6	58	Over 60
-	100	268	Total

Socio-economic implications of date cluster necrosis

The effects of cluster necrosis on palm growers' income. Table 8 shows the distribution of the income rate of date farmers before and after the cluster necrosis. After the outbreak of the disease, the palm growers' income has decreased year after year. Therefore the income of high-income groups is deducted and more farmers are included in the low-income groups. According to Table 8, the share of palm growers with revenues over 5,000 Rials has decreased from 49/25% in the period before the event of the disease to 20/14% of the next period.

Table 7: Distribution of income before and after the date cluster necrosis.

Total	Over 5000 Rials	4000 to 5000 Rials	3000 to 4000 Rials	2000 to 3000 Rials	1000 to 2000 Rials	To 1000 Rials	Description	Variable
268	132	51	38	24	18	5	Frequency	Before necrosis
100	49/25	19/03	14/18	8/95	6/7	1/8	Percentage	
268	54	3	63	50	40	29	Frequency	After necrosis
100	20/14	11/9	23/5	18/6	14/92	10/8	Percentage	

This is while the share of income between 2000 and 3000 Rials has increased from 8/95 per cent to 18.6 per cent. Generally, the income level of date farmers has significantly subsided after the outbreak of the date cluster necrosis.

As explained, when the region's date is infected both its performance and price will decline as a result. The palm grower will face a 40-60 percent reduction in performance in the polluted areas on the one hand and given the severe impact of the quality of the date cluster, the grower would also face a big price fall. As a result, the disease would incur reduced revenues of 186 million Rials per hectare for the farmers.

Table 8: Studying the date income situation before and after the cluster necrosis infection.

Income (Rial – Kg)	Price (Rial – Kg)	Yield per hectare (Kg)	Description
210000000	35000	6000	Before the infection
54000000	15000	3600	After the infection (40% damage)
24000000	10000	2400	After the infection (60% damage)

The effects of the date cluster necrosis on area under cultivation. The findings showed a sharp decline in the area under cultivation after the outbreak of the disease. In such circumstances, many of the gardens have dried. Many palm growers who had smaller palm groves had to leave theirs and seek other jobs due to a rise in costs incurred by the electricity and water prices and the high costs of fighting the disease. Since 1997 following the outbreak of the disease in palm groves of the cities of Bam and Jiroft, the percentage of palm trees is decreasing day by day. Palm groves less than 2 hectares are phasing out of agricultural activities and larger gardens over 2 hectares are getting smaller day in day out (Table 10).

Table 9: Distribution of the palm gardens.

Over 5 hectares	From 3 to 5 hectares	From 2/5 to 3 hectares	From 2 to 2/5 hectares	From 1/5 to 2 hectares	From 1 to 1/5 hectares	From 0/5 to 1 hectare	Less than 0/5 hectares	Description	Variable
20	19	32	35	36	30	78	18	Frequency	Before necrosis outbreak
7/4	7/08	11/94	13/05	11/19	12/5	29/1	6/7	Percentage	
12	10	5	4	8	12	26	2	Frequency	After necrosis outbreak
4/4	37/3	1/86	1/49	2/98	7/47	9/7	0/7	Percentage	

Reference: Research Findings

The effects of date cluster necrosis on employment. Among the significant outcomes of the disease, one can refer to its impact on the labor market and employment. Table 10 presents the main results of the study on the occupations of heads of households surveyed in periods before and after the drought.

Table 10: Distribution of the main occupations before and after the date cluster necrosis.

Total	Unemployed	Other	Services	Handicrafts	Brokering	Gardening	Description	Variable
268	-	-	12	10	15	231	Frequency	Main job before the infection
100	-	-	4/47	3/7	5/6	86/19	Percentage	
268	-	-	31	25	61	151	Frequency	Main job after the infection
100	-	-	11/5	9/3	22/7	56/3	Percentage	

Reference: Research findings

The results shows 86/19 percent of the households surveyed in the region had been palm grove owners before the outbreak of the disease and the amount decreased to about 30 percent after the infection. This is while that, occupations such as brokering had increased from 5/6 percent before the disease to 22.7 percent in the period after the outbreak. But, since date is a mono-product in the region, palm growing is considered as the main occupation of the heads of the households after the necrosis outbreak but with a much lower percentage.

The results concerning temporary and permanent job changes show that 43/6 people have changed their jobs temporarily after the outbreak of the date cluster necrosis.

Table 11: Distribution of permanent and temporary job change after the date cluster necrosis outbreak.

Total	No	Yes	Description	Variable
268	243	25	Frequency	Permanent job change after the infection
100	90/67	9/32	Percentage	
267	151	117	Frequency	Temporary job change after the infection
100	56/34	43/65	Percentage	

Reference: Research findings

The distribution of the frequency of the responses provided by heads of households to the question of the impact of the condition on the permanent withdrawal of labor from the agricultural sector shows the date cluster necrosis has a very narrow impact on the permanent withdrawal of labor from the agricultural sector in the region, so that 76/5% of households have selected the "very low" option as an answer. Because most of the households are highly dependent on sources of income of the agricultural sector through palm growing. Since date is a mono-product in the region, permanent job changes are not easily possible (Table 12).

Table 12: Distribution of families about the impact of date cluster necrosis on the permanent withdrawal of labor.

Total	Very high	High	Medium	Low	Very low	Description	Variable
268	0	2	15	46	205	Frequency	The impact of the disease on permanent withdrawal of labor from agriculture sector
100	0	0/76	5/6	17/16	76/5	Percentage	

Reference: Research findings

The impact of date cluster necrosis on investment. Given that the palm trees' old age constitutes one of the main problems of palm groves in the province it is necessary to make investments in amending palm groves through removing improper figures and replacing them with high quality varieties, modifying irrigation systems, mechanization and better operations.

The results of the studies of families on the impact of the necrosis on investing in gardens indicate that 69/7 percent of the total sample (187 people) assesses the impact on necrosis on reducing investment in palm gardens as "moderate". And it means that 69/7 percent of households believe the date cluster necrosis has somehow reduced investment in their gardens. 23/68 percent of them also consider the impact of the disease on investment in the palm groves as very low or low.

Table 13: Distribution of the impact of necrosis on investment.

Total	Very high	High	Medium	Low	Very low	Description	Variable
268	2	15	187	34	30	Frequency	The impact of the disease on investment
100	0/74	5/59	69/77	12/68	11/19	Percentage	

Reference: Research Findings

The impacts of date cluster necrosis on rural migration. Migration is considered as one of the effects and social consequences of a certain condition that put farmers under pressure and forced them to flee their homes. Immigration usually happens individually, with the family, temporarily or permanently. As shown in the Table 14, the number of individual migrations is very low. For example 230 families had no immigration, 28 families had 2 immigrants and 10 families had 3 immigrants and generally there were 86 immigrants in the families studied. Individual immigration often emerges in the form of temporary migration.

Table 14: Distribution of the number of immigration.

Total	Three migrants	Two migrants	Without migration	Description	Variable
268	10	28	230	Frequency	Number of migrants
100	3/7	10/44	85/82	Percentage	

Reference: Research findings

The results showed that after the outbreak of date cluster necrosis, there have been no tendency to migrate. Meanwhile, the migration is influenced by several factors, including government supportive policies for farmers and hoping for agricultural activity to prosper.

The effects of date cluster necrosis on food security. Any society is mainly concerned over the food security of households being compromised. Especially when the bulk of the rural communities' food situation depend on agriculture and its income. Food security's reduction is one of the consequences of each problem or a condition that occurs after the loss of yield and production. Table 15 shows the distribution of the total cost of monthly food consumption of households after the outbreak of the date cluster necrosis.

Table 15: Distribution of monthly food consumption cost per household after the outbreak of the date cluster necrosis.

Total	Over 900,000 Rials	From 700,000 to 900,000 Rials	From 500,000 to 700,000 Rials	To 500,000 Rials	Description	Variable
268	18	132	95	23	Frequency	Total cost of food consumption
100	6/71	49/25	35/44	8/58	Percentage	

Reference: Research findings

The costs of the most households (49/2 percent) are estimated between 700 to 900 thousand Rials, which is a very small number with regard to rural households. So that 92.3 percent of households surveyed said that they paid no attention to the quality of food they used.

Tables 17, and 18 show the frequency of various food groups' consumption before and after the outbreak. Based on the results the consumption of certain food groups has decreased and the consumption of other groups has increased.

Table 17 results show that 2.8 percent of households have had a very low consumption of meat and protein before the outbreak of disease but the consumption increased after the outbreak. 54.1 and 42.9 percent of households had also determined the consumption of protein products before the event as "medium" to "high" respectively.

The frequency of consumption of cereals before and after the outbreak indicates that the use of this type of food has increased from 41.8 per cent to 77.61 per cent after the outbreak.

Table 16: Frequency of consumption of protein products before and after the outbreak of necrosis.

Total	High	Medium	Very low	Description	Variable
268	**115**	**145**	**8**	Frequency	Consumption of various types of protein products before the outbreak
100	**42/9**	**54/1**	**2/8**	percentage	
268	**18**	**64**	**186**	frequency	Consumption of various types of protein products after the outbreak
100	**6/71**	**23/86**	**69/4**	Percentage	

Reference: Research findings

Table 17: Frequency of consumption of protein products before and after the outbreak of necrosis.

Total	High	Medium	Very low	Description	Variable
268	**112**	**102**	**54**	Frequency	Consumption of various types of cereal before the outbreak
100	**41/79**	**38/06**	**20/15**	Percentage	
268	**208**	**52**	**8**	Frequency	Consumption of various types of cereal after the outbreak
100	**77/61**	**19/40**	**2/98**	Percentage	

Reference: Research findings

CONCLUSION AND RECOMMENDATIONS

The dates cluster necrosis infection has incurred heavy damage to the palm groves of the province where deprivation is a great indicator. What remains for a palm grower after a year of hard work would be infected and priceless date clusters. The vastness of the consequences of the outbreak on various dimensions of rural households becomes more clear when you look at the date product on which the rural economy must rely.

The results show that the palm growers' income has decreased year after year following the outbreak. The share of high-income groups has subsided and more palm grove owners are classified as low-income groups. Loss of income causes other consequences for the region including the decline in living standards, education, health, and nutrition.

The research findings showed a sharp decline in the area under cultivation after the outbreak. Many of the gardens have dried up in such circumstances. Many palm growers who had smaller palm groves had to leave theirs and seek other jobs due to a rise in costs incurred by the electricity and water prices and the high costs of fighting the disease.

Holding training classes to introduce methods of disease control, how to minimize the damage during raising and harvest, appropriate harvest time and so on could be very effective.

Heads of households surveyed has been growing palm trees before the outbreak but they have turned to brokering jobs after the outbreak. Most households depend largely on agricultural sector as the main source of income they earn through growing palm trees. Since date is a mono- product, it is not possible to easily change job permanently.

A reduction in the farmers' income forces them to seek fake jobs. Since the region is located on the way of exporting narcotics from Afghanistan, poverty and a fading motivation to work in the agriculture sector could add to the region's social problems. Therefore, it is necessary to identify and boost the employment infrastructure of the region. From among areas concerned creating jobs in tourism sector and producing handicrafts are worth to be paid attention to.

Generally, the results showed that after the outbreak of date cluster necrosis no tendency has been created towards migration. Meanwhile, migration is influenced by various factors including the government policies to support farmers and hoping for the agriculture sector to prosper. The areas which need due attention include government support to farmers to sell their products, the creation of processing plants and the production of by-products from date, granting loans with low interest and easy (without administrative red tape) to growers, and palm gardens insurance.

REFERENCES

Afkham Ibrahimi, A & M. Hassani (2007). Examining the environmental, economic and social impacts of drought and how to deal with it in the Iranian nomadic community, the first conference on consistency with dehydration, Zabul.

Pezhman, H. (2002). Effect of climatic factors on wilting bunches of palm, palm and tropical fruit research institute

Derikvandi, F. (2008). Assessing the effects of socio-economic Rimmelleh development plan. *Journal of Rural Development, Spring* 2008, **11** (1): 198 -173.

Draini, A. and M., Izadi (1999). A report presented at the third meeting of date cluster necrosis, the country's Palm and Tropical Fruits Research Institute

Management and Planning Organization of Kerman Province (2011). "Statistical Yearbook of the province from 2001 to 2011" Management and Planning Organization of Kerman Province Publication

Abdollahzadeh, Gh. (2013). Assessing the consequences of the economic, social and environmental development of tourism, planning and natural Geography, No. **24**, row 52 (4): 34-45

Anabestani, A. and Y. Hajipour (2013), the social and economic effects of conductive projects in rural settlements, *Journal of Regional Planning Ferdowsi University of Mashhad*, **9**(2): 26-38

Ghanbari, Y. (2001). Socio-economic effects of the drought, Proceedings of the First Conference on the fight against crisis, Sistan and Baluchestan.

Karbasi P. (2001). Socio-economic effects of the drought on farmers in Isfahan province. *Proceedings of the first national conference on examining ways to crisis resolution University of Zabol*, Volume **1**: 385-390

Karampour, F. (2003). The date cluster necrosis, Agricultural Research Center, Hormozgan

Saleh, A. (2007), Socio-economic effects of the drought in the province of Sistan and Baluchestan, *Proceedings of the First Conference on the fight against crisis, Sistan and Baluchestan.*

Yazdani, M. H, Jalalian and A. Zanganeh (2009). Assessing the social, economic and environmental impacts of watershed management projects, *Journal of Geography*, Vol. **7**, No. 20, 4(12): 67-80.