Research Paper

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Analysis of social-economic effects of hazelnut cultivation in development of villages in Amlash County

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One of the most important economic activities in rural areas of Iran, especially in the north of the country, is agriculture. In the present study, considering the importance of the hazelnut crop in the rural life of Amlash County, the economic and social effects of hazelnut cultivation on villages and farmers were investigated. This was descriptive-analytical research that the required information was obtained through documentary sources and field studies. The statistical population includes all hazelnut growers in 38 villages of the mountainous area, Amlash County. The sample size was determined 384 items using the Morgan standard table and was distributed among the operators using the random-quota sampling method. The results showed that the economic effects of hazelnut cultivation in the indicators of economic welfare (with an average of (3.76), economic security (3.81), and employment quality (3.72) were higher than the social effects of hazelnut cultivation in indicators of participation (with the average of 3.27) and social capital (3.40) in the study area. Expanding the area under hazelnut cultivation, the government supports by providing low-interest banking facilities and appropriate repayment terms, product insurance, and the construction of conversion and complementary industries are some of the most important ways to develop this activity and increase its economic and social effects in villages of Amlash County.

1. Introduction

The rural economy has a long history on the planet and plays an important role in the location, continuity of residence, wealth production, and job creation. It is one of the most important among the various functions of rural settlements. The initial foundations of the rural economy should be based on agricultural activities. This activity has undeniably affected the system of economic production, nutrition pattern, and many material aspects of rural life to date (Riahi & Azizi, 2020). Agriculture as an economic activity is a set of exploits that humans make from natural inputs to earn a living. In developing countries, agriculture plays a key role in strengthening the foundations of its economy. Since the agricultural sector is important in terms of meeting the food needs of the people, the supply of industrial raw materials, employment, income generation, stability, and its growth can be considered as major factors contributing to the economic and social stability of society (Akbari et al., 2016).

One of the most influential sectors in the economy in Iran is agriculture. It is one of the best ways to develop employment, increase rural households' income, and expand agricultural activities such as cultivation, hor-

ticulture, etc. In this regard, horticultural activities in areas with the necessary potential are among the most critical factors in rural development (Asghari Lafmejani et al., 2016).

As one of the most important sub-sectors of agriculture, Horticulture plays a vital role in job creation, income generation, and rural development. The development of horticultural activity in rural areas has positive economic, social, and environmental effects. Iran is one of the most talented countries producing horticultural products because of climatic conditions and environmental diversity. These conditions make Iran one of the major horticultural countries in the world, and a large share of the occupation and income of villagers are provided through horticultural activities (Ramazannia et al., 2018). Guilan province is the most important geographical area of the country in terms of area under cultivation and hazelnut production because it has suitable environmental conditions.

With 19023 hectares under cultivation and production of 21 tons of crop, this province produces 85% of the country's hazelnuts. So, Guilan is the hub of hazelnut production in the country (Agricultural Jihad Organization of Guilan Province, 2019). Amlash County is one of the most important areas of Guilan province in terms of area under cultivation, production, and number of operators. Amlash has extensive hazelnut orchards in mountainous villages because of the favorable geographical conditions. The study area includes rural settlements of Samam, Kojid, Shabkhus Lat, and South Amlash in the Rankuh District of Amlash County, Guilan Province. Most of the hazelnut orchards in the County are located in the summer highland pasture of Rankuh district, which has three villages, Samam, Kojid, and Shabkhus Lat. In addition to producing hazelnuts, the villagers of this area also grow Echium, walnuts, produce honey and animal products. Among these, the largest share of income is allocated to the cultivation and production of hazelnut, the economic and social effects of which in the villages of this area have been studied and analyzed.

As mentioned, in the mountainous villages of Amlash County, which are less developed in terms of facilities, hazelnut cultivation is the main source of income. So, expanding the area under cultivation, increasing production through the use of high-yielding cultivars, and government support are some strategies to develop villages and improve living standards, income, and prevent rural migration to urban areas that can lead to the development of villages that exploit this product. Based on this, the present study seeks to answer the main question. How much has the cultivation and production of hazelnuts affected the economic and social development of the villages of Amlash county?

Review of literature

Numerous studies have been conducted on the subject of research and in general, the cultivation and production of horticultural products. Kardavani & Pourramazan (2004) investigated hazelnut cultivation and its economic and social effects in the Eshkevarat region of Rudsar County and concluded that this region is the hazelnut hub of Guilan province and the country in terms of area under cultivation and also production. One of the most important economic and social effects of cultivating this crop in rural areas of Eshkevarat is job-creating by attracting workers, creating and generating income for rural households, and the prosperity of agricultural tourism. Omidi (2006) examined the role of agriculture in the development of villages in Shaft County with an emphasis on rice and tea and reported that agriculture plays a key role in the economy and rural life of the County.

However, farmers in this area suffer from some problems such as lack of education, market instability, and lack of government support. Monazzam Ismailpour & Kardvani (2010) investigated the role of agricultural products emphasizing saffron in rural development of Kashmar County and stated that the economic effects of saffron on rural development, welfare and security, job creation, increasing income, population stabilization, and reduction of migration are felt. Pourtaheri et al., (2013) analyzed the economic and social effects of pistachio cultivation on rural development of Damghan County and concluded that the economic impacts of pistachio cultivation in the indicators of economic welfare and job quality were higher than the social effects of pistachio cultivation in the indicators of participation and social capital in the study area. There is also a significant relationship between the economic and social characteristics of farmers in the region and the economic and social effects of pistachio cultivation. Mahdavi & Abdi (2014) analyzed the role of raisin production in the economic development of Jozan district of Malayer County,

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Hamadan province. They reported that agricultural activities related to dried fruit production improved income and employment in the studied villages and led to increased public and private sector investment in these villages. Akbari et al., (2017) investigated the sustainability of pistachio production in rural areas of Rafsanjan County. This study shows that environmental, social, and economic indicators of pistachio cultivation have a positive and significant effect on the sustainability of villages in Rafsanjan County, in which the share of economic and social indicators is more than the environmental index. Ramezania et al., (2018) analyzed the role of horticulture in sustainable rural development with emphasis on pistachio cultivation in the Shahabad district of Bardaskan County.

They concluded that there is a positive relationship between horticulture (pistachio cultivation) and improving the lives of villagers with a 99% confidence level. The results also showed that the expansion of horticultural activity had increased employment and income in the Shahrabad rural district of Bardaskan County. Ziaeian Firoozabadi et al. (2019) investigated the effects of expanding Rosa damascene cultivation on the economy of rural settlements in the Lalehzar district in Kerman province. They reported that the expansion of Rosa damascene cultivation created employment in making Rosewater and related activities, attracting rural tourists, earning income, saving, and investing in its activities. Thus, the expansion of Rosa damascene cultivation was influential in the economy of the rural settlements studied. Riahi & Azizi (2020) examined the effects of saffron cultivation on the economy of operators in rural areas of Tehran.

They concluded that the saffron cultivation has a positive effect on the economic components studied, including employment with an average of 4.09, improving the quality of services and facilities with an average of 4.06, access to services and facilities with an average of 4.01, income with an average of 3.28, savings and investing with an average of 3.81, and social welfare with an average of 3.80. Each of the mentioned components had positive effects on economic indicators among operators and rural households of the operator, so that income, savings, employment, diversity of economic and occupational activities increased to an acceptable level in rural areas.

In the literature, rural development is related to the village's structural economic, social, and natural relations. Development plans should be based on these conditions, capabilities, and limitations of the rural environment to provide the ground for growth, sustainability, and continuous development. In the economic structure of rural areas of different countries, agriculture is the main axis of livelihood (Yasouri & Javan, 2015). Agricultural activities play a significant role in achieving rural development. Given the growing population and increasing demand for food, and the key role of agricultural products in providing food security, achieving a favorable economic and production situation that makes the country needless of imports, is always one of the goals of the agricultural sector (Pourramzan, 2015). Developing countries, including Iran, often rely on agricultural products, and agricultural activities are often carried out in rural areas. So, the issue of rural development is important to improve the traditional methods of agricultural production and optimal use of land and resources of production and distribution of products, as well as for the social and cultural modernization of villages (Mahdavi, 2007). Villages play an important role in the national economy and sustainable food security through the production of agricultural products, and in order to continue this role, the need for attention and planning in these areas is strongly felt (Rezvani, 2008).

Famous theorists have always proposed various theories about agriculture in rural development. Arthur Lewis considers agriculture as the basis and axis of development and states that achieving economic development requires raising the rate of per capita production in the agricultural sector. Neil Smelser believes that rural society can achieve comprehensive development through agriculture moving from subsistence farming to agricultural production for trade (Motiei Langroudi, 2003). Ricardo believes that the three groups, "capitalist, worker, and landowner," organize the production process. The capitalist plays a key role in Ricardo's economic model. The capitalist leases the land, employs the worker, and provides the factors and means of production. In this way, production is organized. To make more profit, the owner of the capital tries to use the best employment opportunities for his capital. Efforts to make better use of capital in different sectors of the economy also lead to the optimal allocation of factors. More importantly, profit reinvestment causes capital accumulation, which is nec-

essary for the creation and continuation of economic development (Motevaseli, 2007).

Horticulture, as a subset of the agricultural sector, has significant economic effects such as job creation, improving living standards, income generation and production, economic welfare, employment quality, economic security, improving the livelihood of villagers, poverty reduction, helping the agricultural sector in the region, and creating savings and capital formation.

Cultivation and production of hazelnut are important in terms of economic. Hazelnuts can provide significant income for farmers because of their long shelf life and easy transportation. Cultivating hazelnuts in sloping lands can, in addition to soil stabilization, turn low-yielding rainfed lands into economic gardens. Be very effective in creating productive employment. Cultivating hazelnuts on sloping lands can lead to soil stabilization and the conversion of low-yield rainfed lands into economic gardens. In the present study, the economic and social effects of hazelnut cultivation on villages in Amlash city are investigated.

2. Materials and Method

2.1. Study area

The geographical area of this research is Amlash County, Guilan province. This County with an area of about 515 km2 is located in the geographical coordinates of 36° and 50' to 37° and 8' North latitude of the equator and 50° and 60' and 50° and 16' East longitude of the meridian of origin. Amlash County is limited from the north to the Countis of Langrud and Rudsar from the west and south to the County of Siahkal and from the east to Rahimaabad Rudsar (Management and Planning Organization of Guilan, 2019). Amlash County has two districts, Rankuh and Central. Samam, Kojid, and Shabkhus Lat rural districts are districts of Rankuh and North Amlash, and South rural districts are part of the central district. Based on the latest administrative-political divisions, this County has 146 villages, of which 77 villages are located in Rankuh and 69 villages are located in the central part (Statistical Yearbook of Guilan Province, 2018). The study area includes 38 villages with hazelnut cultivation in Samam, Kojid, Shabkhus Lat, and South Amlash rural districts.

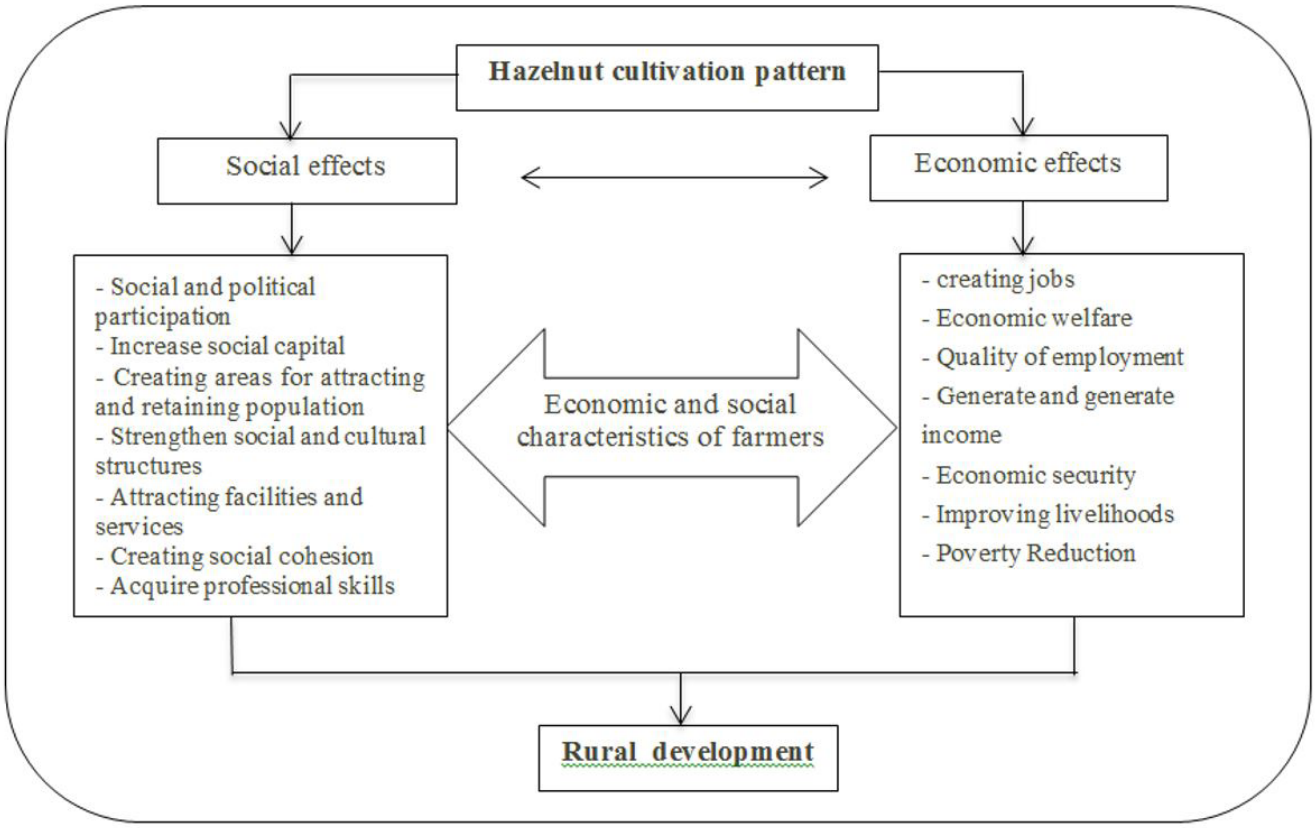

Figure.1 Conceptual model of research

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2.2. Study area

The present research is applied in terms of purpose and a descriptive-analytical from the type of correlational research in terms of nature and method. The required information related to the theoretical foundations of the research, research background, and geographical features of the study area were obtained through documentary sources and determining the economic and social effects of hazelnut cultivation on the development of villages in Amlash County. Because it is not possible to study all operators of this product in the villages of the County, the random-quota sampling method was used to collect information. Statistical methods such as correlation coefficient test, Cramer`s V test, T-test, ETA correlation coefficient (ETA), and X2 test were used to analyze the data. Data were processed through SPSS software, and tables and maps were drawn using Excel and Arc GIS software. The statistical population of the study was 38 villages with hazelnut cultivation in Amlash County. The sample size was prepared using the Morgan standard table, and because of the multiplicity and dispersion of villages and population in the study area, the random-quota sampling method was used. The number of hazelnut cultivation villages was divided into small to large villages based on population. To determine the sample size based on population, the number of hazelnut cultivation villages was divided into small to large villages. The sample size was identified as 9 villages and 384 questionnaires for distribution and completion.

The validity and reliability of the questionnaire were obtained 0.848 using experts and Cronbach's alpha test. In this study, hazelnut cultivation is considered an independent variable, and economic and social effects with its components listed in Table (1) are dependent variables.

3. Results and discussion

3.1. The area under cultivation, production, and distribution of hazelnut cultivation

Amlash County is located in the east of Guilan province. This County has 2 districts and 5 rural districts that Hazelnut is cultivated, and produced in 4 villages of Samam, Kojid, Shabkhus Lat, and South Am-

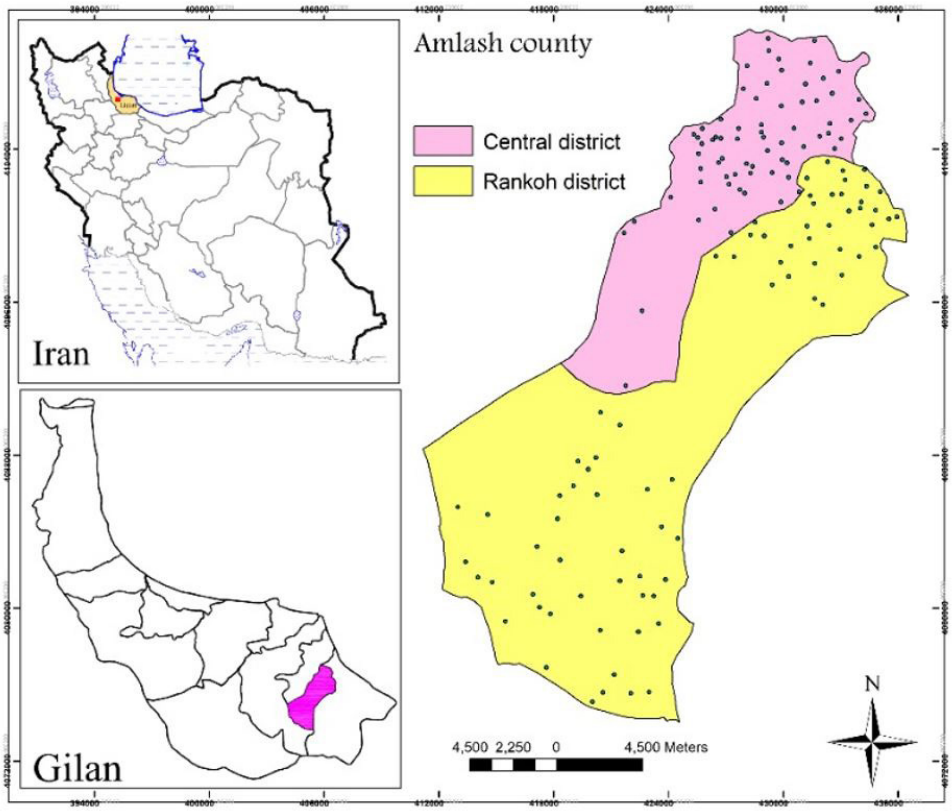

Figure.2 The geographical location of the study

Table 1. Research variables and components

Independent variable	Dependent variable	
	Social effects	Economic effects
Cultivation of hazelnuts	-Prosperity of city-village relations -Creating areas for attracting and retaining population -Concentration of agricultural service centers -Social and political participation -Increase social capital -Strengthen social and cultural structures -Attracting village facilities and services -Acquire professional skills related to hazelnut cultivation - Creating social cohesion	-Creating jobs -Economic welfare -Quality of employment -Economic security -Poverty Reduction -Improving the livelihood of the villagers -Generate and generate income -Assistance to the agricultural sector

lash. The area under hazelnut cultivation in Amlash County is 1950 hectares, its production amount is 2340 tons, and the yield per hectare is 1200 kg (Jihad Agricultural Management of Amlash County, 2019). The villages of Amlash County with hazelnut cultivation, which are located in mountainous areas, have high capabilities for the cultivation and production of this product. Hazelnut cultivation in these villages is the most important source of income and livelihood for the villagers. This product is also environmentally important, prevents soil erosion in sloping areas, and generates income and jobs for rural households.

Although there is a great deal of importance in the cultivation and production of hazelnuts, its production faces problems and issues such as lack of conversion and complementary industries, lack of processing plants, lack of water resources, and crop insurance. Production of Hazelnut in the villages of Amlash County in recent years has an upward trend. The most important reasons were the increase in the price of hazelnuts in the market, the welcome of food and cosmetics factories, pharmaceutical industries, and therapeutic properties. Climate change sometimes results in an unfavorable crop year for the farmer. For example, snowfall and frost in April, which is the time of flowering of the hazelnut fruit, causes frost and loss of that year's crops.

3.2. Economic effects of hazelnut cultivation

In this part of statistical analysis, research hypotheses are examined using statistical tests. To test the first and second hypotheses, the independent variable of hazelnut cultivation and the dependent variable of economic prosperity and social prosperity were assessed simultaneously. The effect of the independent variable on the dependent variable was asked directly from the sample units. T-test was used to test this hypothesis. In these hypotheses, the effect of hazelnut cultivation on the economic prosperity of the villages of Amlash County is investigated using the parametric test t (one-sample t-test) with the test value of 3. The reason for choosing the test value of 3 was to evaluate each item using the Likert scale. In the Likert scale, the value of scores is in the range of numbers 1 to 5. The number 3 indicates the average affections. In other words, if the average of this index is more than 3 and the level of significance of the test confirms that there is a significant difference, the effect of hazelnut cultivation on economic prosperity will be confirmed. Hypothesis 1: Hazelnut cultivation causes economic prosperity in the villages of Amlash County. In this hypothesis of the research, the null hypothesis and the opposite hypothesis are as follows:
H0: Hazelnut cultivation doesn't cause economic prosperity in the villages of Amlash County.

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Table 2. Area under hazelnut cultivation in Amlash County

Amlash South district	Shbkhoslat district	Kojid district	Somam district	Number of operators	Amlash County	Area under cultivation
413	10	388	1139	3900	1950	hectare

Source: Jahad Agricultural Management of Amlash County, 2019

H1: Cultivation of hazelnut crop causes economic prosperity in the villages of Amlash County.

$$H_0: \mu \leq 3$$
$$H_1: \mu > 3$$

Given that economic prosperity is measured by three variables of economic welfare, economic security, and quality of employment, in the t-test table, first, each component is examined separately and finally as a whole (economic prosperity).

According to Table (3), it is observed that for the sample of 384 people, the average, standard deviation, and standard error of economic welfare is 3.76, 0.44, and 0.023, respectively. The average, standard deviation, and standard error of economic security is 3.81, 0.97, and 0.051, respectively. The average, standard deviation, and standard error of the quality of employment is 3.47, 1.06, and 0.56, respectively. Also, the index of economic effects has an average, standard deviation, and standard error of 3.72, 0.58, and 0.03, respectively. Based on this, the economic effects of hazelnut cultivation and production on the development of villages in Amlash County can be confirmed and considered relatively high.

Economic welfare

According to Table (4), it is observed that the value of t-test statistics is 32.58, and the significance level of the test for economic welfare is equal to 0.000 and is less than 0.05 error. The mean difference of this index shows that economic welfare is 0.76 units higher than the test value. So, the null hypothesis, which indicates that hazelnut cultivation has no effect on economic welfare is rejected, so it is concluded that hazelnut cultivation led to the development of economic welfare in the villages of Amlash County. The economic welfare includes housing type, housing size, number of family trips, consumption of red and white meat, purchase of necessities, purchase of durable goods such as refrigerators and televisions, and so on. In the meantime, the effect of hazelnut cultivation on each of the above items and the proof of this matter proves the economic effects of this product on the operators. This means that as the income from hazelnut cultivation increases, the welfare of people will certainly increase, for example, a better car, a better home, more durable goods, and better nutrition. It is well evident in the study area that people who had more hazelnut orchards and higher income from the sale of hazelnuts, had a better life and more facilities, which has been one of the economic effects of hazelnut cultivation in improving the livelihood of villagers.

Economic security

According to Table (4), it is observed that the value of t-test statistics is equal to 15.91, and the significance level of the test for economic security is equal to 0.000 and less than 0.05 error. The mean difference of this index shows that economic security is 0.81 units higher than the test value. Therefore, the null hypothesis, which indicates that hazelnut cultivation has no effect on economic security is rejected, and it is concluded that hazelnut cultivation led to the development of economic security in the villages of Amlash County. Usually, in the production and cultivation of crops, people do not take the risk to do so if there is no economic security. This means that all aspects of the matter are considered for the production of the product and then proceed to production.

In this regard, the people of the study area consider hazelnut cultivation to be partly within the scope of economic security. They believe that the production

Table 3. Descriptive indicators for the economic impact index and its components

Description	Number of Observations	Average	Standard Deviation	Standard Error
Economic welfare	384	3.76	0.44	0.023
Economic security	384	3.81	0.97	0.051
Quality of employment	384	3.47	1.06	0.56
Economic effects	384	3.72	0.58	0.03

Table 4. T-test and significance level of economic impact index and its components

Description	Test Statistics t	df	sig	Mean difference	lower bound	upper bound
Economic welfare	32.58	383	0.000	0.76	0.71	0.80
Economic security	15.91	383	0.000	0.81	0.71	0.91
Quality of employment	8.39	383	0.000	0.47	0.36	0.58
Economic effects	23.59	383	0.000	0.72	0.66	0.78

and cultivation of hazelnuts can lead to stability in the production and continue as a continuous activity, and in all conditions, good or bad, can be considered as a safe work with almost reasonable profit. According to the respondents, fluctuations in the price of hazelnuts greatly affect their economic security. With the increase in the selling price of hazelnuts, the villagers continue to cultivate. But price fluctuations greatly threaten this security. Also, if the banks are not good supporters and do not help the villagers by providing facilities and loans, rural households will no longer want to stay in the village, and as a result, agricultural activity in the area will virtually disappear. Therefore, all factors must work together to motivate the production of hazelnuts and create opportunities for progress and development in agriculture. With the direct and continuous support of the government, agriculture continues to thrive in rural areas, and its economic effects are visible at the national level.

Quality of employment

According to Table (4), it is observed that the value of t-test statistics is equal to 8.39, and the significance level of the test for employment quality is equal to 0.000 and is less than 0.05 error. The mean difference of this index shows that the quality of employment is 0.47 units higher than the test value. Therefore, the null hypothesis, which indicates that hazelnut cultivation has no effect on the quality of employment is rejected, and it is concluded that hazelnut cultivation improved the quality of employment in the villages of Amlash County. Regarding the quality of employment, the villagers use traditional agriculture methods and do not believe in new technology. The production and cultivation of hazelnuts had not much effect on the quality of employment in the area. This means that it played a small role in the production of new jobs or the improvement of production activities and, consequently, the quality of employment in the

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region. Given the current economic situation, hazelnut cultivation is for income to meet the basic needs of the villagers. Also, hazelnut cultivation has created some jobs in the village, one of the reasons for which is the lack of sufficient motivation to stay in some villages and the lack of facilities and as a result, the tendency to urban space.

According to Table (4), the value of t-test statistics is equal to 23.59, and the significance level of the test for economic effects is equal to 0.000 and is less than 0.05 error. The mean difference of this index shows that economic effects are 0.72 units higher than the test value. Therefore, the null hypothesis, which indicates that hazelnut cultivation has no effect on economic development is rejected, and it is concluded that hazelnut cultivation led to economic development in the villages of Amlash County. The results showed the role of hazelnut cultivation and production in rural development and improving people's lives working in hazelnut areas. This role and impact on economic welfare were more than in other cases. With increasing efforts in the cultivation and production of hazelnuts, its output leads to economic development and progress of families and the village. Meeting the basic needs and necessities of life, including proper housing and cars, better-living facilities, economic security and safety resulting from production, and improving the quality of employment in the region are also the economic results of optimal hazelnut cultivation.

Definitely having a suitable land and garden, providing water resources needed for the garden, good improvement and maintenance of gardens, using the opinions of experts, and using new methods and inputs are effective in the rate of crop yield and creating income and employment, and finally creating welfare and improving livelihood for the villagers. Therefore, the first hypothesis based on the economic impact of hazelnut cultivation on the development of villages in Amlash County and economic prosperity in the region is proven.

In this hypothesis of the research, the null hypothesis and the opposite hypothesis are as follows:

$$H_0: \varphi = 0$$
$$H_1: \varphi \neq 0$$

At this stage, to measure the relationship between economic characteristics and economic effects of hazelnut growers, 10 items in economic characteristics and 5 items in social characteristics of hazelnut farmers were used. According to the type of data scale, Phi and Cramer's V correlation coefficient and ETA correlation coefficient were used. As shown in Table (5), the relationship between economic characteristics and calculated economic effects has a significance level of less than 0.05, indicating a significant relationship between economic characteristics and economic effects. The results obtained from the correlation coefficient measures are given in Table (5).

3.3. Social effects of hazelnut cultivation

The social effects of hazelnut cultivation were measured by two variables of social and political participation and social capital. In the t-test table, first, each component is examined separately and finally as a whole (social prosperity).

Test of the second hypothesis: Hazelnut cultivation causes social prosperity in the villages of Amlash County. In this hypothesis of the research, the null hypothesis and the opposite hypothesis are as follows:

H0: Hazelnut cultivation doesn't cause social prosperity in the villages of Amlash County.

H1: Cultivation of hazelnut crop causes social prosperity in the villages of Amlash County.

$$H\_0: \mu \leq 3$$
$$H\_1: \mu > 3$$

According to Table (6), it can be seen that for the 360 people, the average, standard deviation, and standard error of social and political participation is 3.27, 0.65, and 0.034, respectively. The average, standard deviation, and standard error of social capital is 3.4, 0.7, and 0.611, respectively.

Social and political participation

According to Table (7), it can be seen that the value of t-test statistics is equal to 8.07, and the significance level of the test for this index is equal to 0.000 and is less than 0.05 error. The mean difference of this index

Table 5. Relationship between farmers' economic characteristics and economic effects of hazelnut cultivation based on Kramer Phi and V correlation coefficient and ETA

correlation coefficient	Type of housing	Quality of housing	Dating housing	Residential unit size	Number of trips	Vehicle ownership	Ownership of durable goods	Consume red meat	Consume white meat	Economic security	Quality of employment
Cultivation history	0.43	0.61	0.54	0.61	0.57	0.59	0.83	0.53	0.57	0.79	0.75
Type of land ownership	0.36	0.66	0.50	0.55	0.63	0.55	0.61	0.51	0.58	0.70	0.66
Area under cultivation	0.60	0.67	0.65	0.69	0.54	0.65	0.86	0.68	0.76	0.86	0.86
Yield per hectare	0.56	0.70	0.79	0.70	0.64	0.74	0.82	0.76	0.73	0.95	0.93
The amount of investment	0.27	0.47	0.49	0.41	0.53	0.53	0.56	0.50	0.50	0.70	0.56
Use of bank credits	0.29	0.60	0.66	0.52	0.76	0.71	0.63	0.70	0.56	0.89	0.77
Market familiarity	0.48	0.69	0.63	0.60	0.54	0.61	0.77	0.60	0.52	0.90	0.88
How to sell a product	0.49	0.55	0.62	0.69	0.43	0.49	0.59	0.50	0.50	0.69	0.77
Use of mechanization	0.16	0.12	0.16	0.13	0.14	0.13	0.09	0.21	0.11	0.14	0.20
Transformation of cultivated lands	0.20	0.19	0.23	0.28	0.20	0.22	0.25	0.22	0.44	0.27	0.28

Table 6. Descriptive indicators for the social impact index and its components

Description	Number of Observations	Average	Standard Deviation	Standard Error
Social and political participation	360	3.27	0.65	0.034
Social capital	360	3.4	0.7	0.037
Social effects	360	3.36	0.61	0.032

Table 7. Results of t-test and significance level

T test with test item value 3						
Description	**Test Statistics t**	**df**	**sig**	**Mean difference**	**lower bound**	**upper bound**
Social and political participation	8.07	359	0.000	0.27	0.021	0.34
Social capital	11	359	0.000	0.4	0.33	0.48
Social effects	12.08	359	0.000	0.36	0.29	0.42

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shows that the social and political participation is 0.27 units higher than the test value. Therefore, the null hypothesis, which indicates that hazelnut cultivation has no effect on social and political participation, and it is concluded that hazelnut cultivation led to the development of social and political participation in the villages of Amlash County.

The effect of crop production on the creating social and political participation of villagers in the region is one of the social effects of any agricultural activity. This means that agricultural activity, in addition to forcing the villagers to cooperate in cultivation and production and creating a sense of cooperation among the people, also causes them to participate in non-agricultural activities in the village. This participation is both socially and politically.

In the social participation, the villagers are involved in civil, service, infrastructure measures and creation of various transportation water, electricity, gas networks, construction of schools and clinics, creation of festivals, educational classes and social programs, etc. Political participation also includes participation in village council elections and government programs in rural development, etc., which is almost appropriate and good in the study area. This varies in different regions and villages. For example, in small villages, participation is in the form of assistance and cooperation of individuals in harvesting or planting hazelnuts and other agricultural matters. In harvesting hazelnuts, instead of taking labor from other villages, they try to help each other. Their participation in the political issues of the country and the region is also in the form of their active presence in these issues.

In medium and large villages, this participation is seen on a larger scale, meaning that people in several groups work together to harvest hazelnuts. They play an important role in the development and productive affairs of the village, they also participate in the political affairs and elections of the council, but their participation, both social and political, is lower compared to the social capital index. The social cohesion resulting from hazelnut cultivation in the form of intellectual participation is also evident. In other words, they consult and cooperate with village managers to prepare rural plans and projects so that everyone can better participate in rural development.

Social capital

According to Table (7), it is observed that the value of t-test statistics is equal to 11, and the significance level of the test for this index is equal to 0.000 and is less than 0.05 error. The mean difference of this index shows that social capital is 0.4 units higher than the test value. Therefore, the null hypothesis, which indicates that hazelnut cultivation has no effect on social capital is rejected, and it is concluded that hazelnut cultivation led to a boom in social capital in the villages of Amlash County. One of the consequences of agricultural activities is the creation of social capital. Social capital is evident in indicators such as obtaining professional training related to hazelnut cultivation, acquiring professional skills and knowledge related to hazelnut cultivation, sustainability in the village, strengthening the socio-cultural structures of the village, stability of political and social security of the village and attracting facilities and services to the village. In the study area, the share of social capital is higher than socio-political participation. Respondents believe that hazelnut cultivation increases spatial belonging to the village and reduces migration to the city. Also, if the villagers remain and increase hazelnut cultivation and production activities, facilities and services will increase. As the people have more contact with agricultural departments and service centers, they gain experience and professional skills related to hazelnut cultivation. They also can express the problems of a village, and as a result, enter the facilities and services required to the village. The cultural and social structures of the village, including the connection with educational, cultural, and social centers, are also strengthened by hazelnut cultivation and production activities.

According to Table (7), the value of t-test statistics is equal to 12.08, and the significance level of the test for this index is equal to 0.000 and is less than 0.05 error. The mean difference of this index shows that social effects are 0.36 units higher than the test value. Therefore, the null hypothesis, which indicates that hazelnut cultivation has no effect on social effects is rejected, and it is concluded that hazelnut cultivation caused positive social changes in the villages of Amlash County. According to the output of information obtained from the respondents (villagers) in the two components of social and political participation and

social capital, participation seems to be less and the role of capital seems more prominent. This means that participation in matters such as the implementation of rural plans and projects and civil works is done by all people in the village, and most of them are special people who work in intellectual, civil, production, and partnerships. People who have a higher level of hazelnut cultivation and consequently a higher income try to get more involved in rural development projects, which is evident in the study areas. Of course, this participation is more visible in small villages, and their cooperation in various fields of hazelnut production was more significant than in larger villages.

But in terms of social capital, people had positive and better views about this component and believed that hazelnut cultivation could be an important factor in preventing people from migrating to the city, establishing centers and services in the village, and acquiring skills and professional knowledge related to hazelnut cultivation. This has been quite evident in the selected villages. However, the social effects of hazelnut cultivation seem less than the economic effects. Because until the economic affairs of cultivation are reformed and institutionalized, the social effects and consequences cannot be accepted.

4. Conclusion

The present study investigated the economic and social effects of hazelnut cultivation in 32 items in the villages of Amlash County. Statistical analysis has shown that economic effects such as well-being, economic security and quality of employment are more related to the areas of knowledge and professional skills than the social effects of hazelnut cultivation such as political and social participation and social capital. Considering the process of hazelnut cultivation and production as well as the spatial and production appendix, it can be said that the formation and development of hazelnut cultivation pattern in the villages of Amlash County is mostly due to economic characteristics such as high income and added value created by this product in each is the year. The social effects of the development of hazelnut cultivation in the region, including increasing the level of participation, training, knowledge, and professional skills of hazelnut growers in the villages of Amlash County, can be considered as initial and background measures to increase the economic effects of hazelnut cultivation in the region.

Similar research has been done in hazelnuts, almonds, saffron, olives, pistachios, and Rosa damascena. Kardavani and Pourramzan (2004) studied the problems of hazelnut cultivation and its economic and social effects in the Eshkevarat region of Rudsar city. Their research showed that hazelnut cultivation is the main source of income for the villagers in the region. Creating jobs by attracting labor and generating income for rural households were the most important economic effects of cultivating this crop. The present research is in line with the research of Kardvani and Pourramzan.

Monazzam Ismailpour and Kardavani (2010) investigated the role of saffron cultivation in Kashmar city and its economic and social impact, which are consistent with the results of the present study. Pourtaheri et al. (2013) investigated the economic and social effects of pistachio cultivation. The economic effects (the increase in pistachio prices in recent years and the creation of jobs and incomes for farmers) of pistachio cultivation were more than the social effects. Also, the results of the present study were consistent with the research of Akbari et al. (2017) on the sustainability of pistachio production in rural areas of Rafsanjan city and the positive impact of environmental, social, and economic indicators of pistachio cultivation on the sustainability of villages in this County and the greater share of economic and social indicators than the environmental index. The results of the present study were consistent with the research of Ramezania et al. (2015), who examined the role of horticulture in sustainable rural development with emphasis on pistachio cultivation and concluded that there is a positive and significant relationship between pistachio cultivation and improving the lives of villagers and increasing employment and income in Shahrabad rural district, Bardaskan. The results of the present study were also consistent with the research of Ziaeian Firoozabadi et al. (2017), who investigated the effects of the expansion of Rosa damascena cultivation on the economy of rural settlements in Lalehzar district, Kerman province and concluded that Rosa damascena cultivation creates employment in the field of making Rosewater and related activities, attracting rural tourists and also earning income saving and investing in its activities. The results of the present study were also consistent

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with the research of Riahi and Azizi (2016).

They investigated the effects of saffron cultivation on the economy of farmers in rural areas of Tehran and the positive effect of saffron cultivation on economic components, including employment, access to services and facilities, improving the quality of facilities and services, savings and capital, income, social welfare and the positive effects of economic indicators among the beneficiaries that increased income, savings, employment, diversity of economic and employment activities in the studied villages.

Generally, it can be concluded that the cultivation and production of agricultural products have many economic and social effects. The creation of income, employment, and social participation of individuals is the most important of these effects. Of course, if the cultivation of crops, whether horticultural or agricultural, is done in a principled and scientific manner and with the advice of experts, it will certainly have significant economic and social effects and results. All this is possible thanks to the government's widespread support for farmers. Of course, the cultivation of hazelnut in Amlash is also associated with issues and problems that are directly related to the low yield of hazelnut trees in the region. Issues such as severe water shortage, non-use of high yielding cultivars, pests and diseases, high production of basal shoots, non-observance of cultivation intervals, and multi-base hazelnut trees are the most important issues in hazelnut cultivation in the study area. Gardeners in the region are facing a series of problems because of the existence of these issues, such as water shortage, low yield of local cultivars, the existence of business brokers, lack of guaranteed purchase price of hazelnuts, lack of factories and processing of hazelnut, and lack of government support through financial facilities, crop yields, wildlife attacks, etc. are among the most important problems. Hazelnut as a dominant garden product in Amlash County is of special importance because its cultivation is intertwined with the life of the region's people and has created a close relationship between the establishment of rural households and the cultivation and production of this crop. This product has important economic and social effects such as creating employment by attracting labor, creating and generating income for rural households, improving the living conditions of villagers, prosperous urban-rural relations, creating opportunities for attracting and retaining population, social and political participation, and strengthening cultural and social structures are prominent examples.

According to the results, the following solutions can be suggested to increase the economic and social effects and reduce issues and problems related to hazelnut cultivation:

- Development and expansion of the area under hazelnut cultivation in the villages of Amlash County in order to increase income and reduce economic and social issues such as unemployment, migration.

- Support and encourage the government to employ educated people in the field of agriculture to improve the situation of hazelnuts cultivation and production.

- Payment of bank facilities with easy repayment to farmers to improve hazelnut orchards and cultivate high-yielding and drought-resistant cultivars.

- Government support for hazelnut farmers in the form of insurance and guaranteed purchase of hazelnut products.

- Creating a suitable platform to promote and teach new horticultural methods and cultivate high-yielding cold and pests-resistant cultivars for the villagers.

- Mechanization of hazelnut production stages and creation of appropriate facilities in the village for marketing and exporting hazelnut products.

- Establish the hazelnut product research and processing center, and create value chains and business clusters.

- Construction of conversion and complementary industries and efforts to brand hazelnut products in the villages of Amlash County.

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Conflict of interests

The authors declare no conflict of interest.

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