

Effective Factors on Development of Poplar Cultivation (Gilan Province, Iran)

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Today, supplying Iran's needed wood, according to the market demand and lack of wood supplement from the internal resources specially forests, makes the wood cultivation an important issue. This study was aimed at evaluating the economical-social factors affecting the development of spruce wood cultivation in Somesara city. This is applied study and the research methodology is correlation. The main research tool was questionnaire. Statistical population was 200 spruce cultivator households of Somesara which have cultivated at least 3 acres of spruce wood in 2009-2011, in according to Morgan formula, 126 households were selected by simple random sampling. Statistical analysis was done through SPSS Version 16. Findings about the barriers and limitations affecting the development of spruce wood cultivation in Somesara city showed that lack of wood -consuming industries in Somesara region, low price of spruce wood and the administrative problems for taking bank facilities are the greatest limits in spruce wood cultivation development, respectively. Regression results showed that the first year of spruce wood cultivation, time of educational courses participation, amount of using the governmental facilities, and the first area under cultivation determined 17.5 percent of the spruce wood cultivation.

Key words: Economical- social factors, Development, Wood cultivation, Spruce, Spruce cultivator, Gilan province; Somesara city.

Forest destruction is one of the most important destructions issues. Because of the need for wood and wood industry, population growth, demand rise, unlimited usage of the forest resources, level of the forest reduction, and consequently, importing wood and spending billions of dollars for import, it seems that, very soon, any kind of exploitation, destruction and changing the forest lands which cause wood smuggle should be severely limited and developing the wood cultivation by fast growing trees such as spruce and some needle-leaved trees for providing wood should be programmed.

Today, various factors cause that villagers are predisposed to cultivate wood, especially spruce, in non-forest areas. These factors, in one hand, are the severe limits in supplying material for the dependent industries, current limits for using the forest areas, and low quality and high cost for importing this product; and, in the other hand, price changes of region's agriculture productions, high costs of the products because of the input price rise, and rise of staff costs make serious problems for the region's most agriculture products profitability. But, in contrast, spruce cultivation is more valuable because of the usage of new cultivation methods in its massive production, short-term economic exploitation, and investment return in a shorter time to the other trees cultivation.

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25 m³ per hectare annual production can be achieved if wood cultivation is developed. currently, country's needed wood is supplied by annual harvest of 750.000 m³ of the country's north commercial forest, 3.5 million m³ through wood cultivation and gardens, and 5 million m³ wood through legal ways in addition to an annual supply of 1.5 million m³ wood through importing various wood products, while the annual wood consumption is 14 million m³, through wood cultivation development, resources and the potential of soil and water should be optimally used to overcome this deficiency leading to foreign exchange saving or end wood imports, reduce pressure on forest areas for wood supply, make new employment opportunities, and reach the sustainable natural forest preservation through supplying the country's needed wood. This can prevent negative consequences such as wood price rise, motivation to wood smuggle, illegal entry of woods contaminated with pest and diseases in the country leading to a chaos in wood market, consequently closure of factories for wood and cellulose (Aminpour, 2008).

Now, this level is more than 45.000 and 12.000 hectares in Gilan and Somesara, respectively (Forest and Forest park administration of Gilan, 2009). So, the main problem of this study is that what factors have motivated the region's people to cultivate wood? as more than 12.000 hectares of lands were designated for spruce cultivation and many bounded lands were turned into spruce cultivation lands. Moreover, according to the changes of cultivation method because of agricultural product price alteration and cost rise especially in the region's rice, it is necessary to evaluate that whether these changes are profitable for the development of region's wood cultivation.

This study, according to the population growth and the increasing rate of forest destruction, was carried out to evaluate ways to exit from this situation. Although spruce cultivation is reasonable and, according to some experts, continuing it will resolve many social and economical problems, a social and economical evaluation is needed. More than 12.000 hectares of spruce cultivation lands, out of the country's 150.000 hectares spruce cultivated lands, are in Somesara city (8 percent of all spruce cultivation).

Because Somesara is the country's

outrank city in industries of wood paper, spruce cultivation and their development, factors such as this city's stage in the wood cultivation economy, a part of region's population economical dependence to this product, smuggling, and taking much wood from the forests subordinate human factors and double the necessity of evaluating the economical and social factors related to the wood cultivation in the region.

According to the above capacities and issues, this study was aimed at evaluating the economical-social factors affecting the development of spruce wood cultivation in Somesara city so that the economical and social items and factors affecting the development of spruce wood cultivation in the mentioned city having the highest level of spruce cultivation in the country would be identified.

Spruce, in this study, is *Populus* (*Salicaceae*). Spruce cultivator is a person or family having at least 3 hectares of spruce cultivation in the region. Spruce cultivation is an activity in order to cultivate the rapid growth and yield species like spruce, poplar, eucalyptus, and others for the predetermined objectives of supplying the raw materials of paper, MDF, chipboard, and other factories with a maximum exploitation period of 10 years (Anonymous, 2007).

Few studies were carried out to evaluate factors affecting the development of wood cultivation

Jazirehi (2008) in a study expressed that the rice price had an increasing rate in the country causing that many farmers turn their spruce cultivation lands into rice fields because rice production, from the farmer income point, is more profitable. Vatani and Davanloo (2008), in a study believed that the financial and credit problems are the main problems of carrying out the wood cultivation projects.

Aminpour (2008), reported that the main way for supplying the country's needed wood is through developing the wood cultivation by cultivating suitable numbers of rapid growth species, so the government, to reinforce and develop the wooden industries, can improve the wood cultivation development through material supports such as providing the national areas suitable for wood cultivation; giving inexpensive bank loans and providing a grantee of wood purchase for cultivators.

Yousefi *et al.*, (2008) found out that villagers' low level of literacy, using traditional methods (low and late yield), villagers' lack of knowledge of the new and modified numbers of spruce, lack of knowledge about the methods of spruce integrated cultivation and other factors are the reasons of spruce cultivation level reduction and in this region leading to turn them into fruit gardens.

Asadi (2004) expressed that social factors such as low level of education, having many occupations, replacement of alfalfa with spruce, nonexistence of a strong and organized organizations such as cooperatives, and lack of educational programs in addition to economical factors such as non-profitability of spruce wood because of its price non-rising along with other agriculture products, low income of spruce cultivation due to the long exploitation period in the current traditional situation, lack of financial support for resting the land, lack of purchase and insurance grantee for products, technical issues of spruce cultivation such as disregarding the scientific principals of the cultivation time intervals, depth of cultivation, irrigation methods and totally, unsuitable methods of spruce planting, care, and harvesting are the main reasons of spruce cultivation level reduction in the region.

Ramandhan (2003) found that there is a significant relationship between the plan acceptance and variables of age, sex, income, and the size and number of the farm worker forces.

Louis *et al.*, (1999) believed that economical profit is the first motivating factor in accepting the agriculture forestry system. although the economical factor is most effective factor in making decision to accept this system, social and cultural factors, farm size, level of productions, and their nearness to market have a role in this acceptance.

Results of Belligeri (1996) showed that there is a significant relationship between farmers' knowledge about agriculture forestry, their understanding of agriculture forestry operations' profitability, and its operation acceptance.

Hwang *et al.*, (1993) reported the reduction process of spruce cultivation in South Korea which was because of the villagers' immigration to cities and lack of flat lands for spruce cultivation.

MATERIAL AND METHODS

This is an applied study

The analysis used in this study involved a combination of descriptive and quantitative research and the main methodology is descriptive (non-experimental) and correlation. Statistical population was 200 spruce cultivator households of Somesara which have cultivated at least 3 acres of spruce wood in 2009-2011, in according to Morgan formula, 126 households were selected by simple random sampling. The main research tool was questionnaire. Content and face validity were established by a panel of experts consisting of faculty members and some specialists. Minor wording and structuring of the instrument were made based on the recommendation of the panel of experts. A pilot study was conducted with 30 persons. Computed Cronbach's Alpha score was 71 %, which indicated that the questionnaire was highly reliable.

Gilan province, with a population of 2.453.469 persons, is, after Tehran province, the second broad and populated province of Iran. Having 16 cities including Somesara and an extension of 14.000 km², It takes 1 percent of the country's level of lands (Programming department of Gilan government office, 2008). This study's independent variables are personal, social, economical, and technical characteristics in addition to the barriers and limits of spruce cultivation development. The dependent variable is the rate of spruce wood cultivation development in the more than three hectares farms during the last decade.

For measuring the study hypotheses and relationship between independent and dependent variables, correlation coefficients and stepwise multiple regression analysis were used. Statistical analysis was done through SPSS Version 16.

RESULTS

126 spruce cultivators of Somesara were studied in this study.

Average age of the studied spruce cultivators was 48 years; the youngest and the oldest were 27 and 82 years, respectively. Maximum and minimum frequencies were related to the ages between 31 to 50 years and 21 to 30 years,

respectively. Most of them, 45 ones (35.7%), were high school graduates. Average year of experience of spruce cultivation was 17 years; maximum and minimum were 57 and 2 years, respectively. Most of them, 40.5% had an experience of spruce cultivation between 11 and 20 years.

59/5%, most frequency, stated that they are much interested in spruce wood cultivation. 38.9%, most frequency stated that they are much satisfied with spruce cultivation. 42.9%, most frequency stated that the knowledge rate of context and wood cultivation programs' objectives is at an average level. 71.4%, on the subject of holding educational courses of spruce wood cultivation in the studied region, stated that they did not participated in any course and some courses were not held.

A question was asked from 126 spruce cultivators about factors affecting the spruce cultivation continuance in the region; respondents have prioritized their needs:

42.1% selected the loan; 38.1% need for spruce cultivation cooperatives; 39.7% need for spruce cultivation insurance; 32.5% need for extensional experts for spruce cultivation; 25.14% providing free and governmental sapling for spruce cultivation; 25.14% experts' continual supervising and consulting for spruce cultivation continuance; and 57.1% selected providing the educational packages as the seventh or last priority.

Concerning the effect of spruce cultivation extensional and educational activities, 32% of the spruce cultivators, most frequency, stated these activities at a medium level. In relation to the usage of supportive facilities (loans, agriculture inputs, tools, equipments, and etc),

68.3%, most frequency, stated that they did not use any supportive facility. To determine the factors affecting the development of spruce wood cultivation stepwise regression analysis was used.

Calculating the correlation coefficient between the variables of age, activity experience of the spruce cultivators, rate of spruce cultivation development, and the first area under cultivation, there is a negative correlation between the mentioned variables become significant at a 0.01 level, but there is a positive correlation between the educational level, time of participation in the educational courses (hrs), providing free and governmental sapling for spruce cultivators, using governmental facilities (loan), first year of cultivation and the previous application of land become significant at a 0.05 level.

In multiple stepwise regression analysis, the first year of cultivation at the first step, was entered the analysis, meaning that this variable had the most effect and adjusted coefficient of determination (R^2_{adj} -0.094) were calculated. It can be said that this variable, alone, explained about 9% of the development rate of wood cultivation level.

Time of participation in the educational courses, at the second step, was entered the equation; in this stage, (R^2_{adj} -0.123) were calculated. At the third step, first area under cultivation variable was entered the stepwise regression; the adjusted coefficient of determination (R^2_{adj} 0.144) were calculated. At the last step, the variable of the usage rate of governmental facilities was entered the stepwise regression; and the adjusted coefficient of determination (R^2_{adj} -0.175) were calculated.

Table 1. Standardized & unstandardized coefficients of wood cultivation developing

Variables	Unstandardized Coefficients B	Standardized Coefficients Beta	t	Sig
Constant	80.642	-	12/704	0.000
The first year of cultivation (X ₁)	0.06	0.235	2.664	0.000
Participation in courses (X ₂)	0.014	0.157	1.855	0.002
First area under cultivation (X ₃)	-0.192	-0.234	-2.57	0.002
Using the facilities (X ₅)	0.01	0.202	2.347	0.002

$R^2_{adj} = 0.175$

According to the results shown in table 6, the regression equation according to B and β quantities were, respectively:

$$Y = -80.642 + 0.06x_1 + 0.014x_2 - 0.192x_3 + 0.01x_4$$

$$Y = 0.235x_1 + 0.157x_2 - 0.234x_3 + 0.202x_4$$

It can be said that 17.5% of the dependent variable's variance are caused by the variable of the first year of cultivation, time of participation in the educational courses, first area under cultivation and using the governmental facilities (Table 1).

DISCUSSION

On the subject of the positive effect of participation time of educational courses on the development level of spruce cultivation, holding educational courses affected the development level of spruce cultivation. In regarding to role of education in the adoption of innovations, Weir and Knight (2000) believed that giving out the innovations in regions with higher education level is more than regions with lower one which confirms the mentioned issues.

In relation to the positive effect of governmental facilities (loan) and the rate of development level of spruce cultivation, using the governmental facilities (loan) affected the spruce cultivation. Thus, results of this study, because of the loan takers' motivation rising, confirm the government's positive role in allocating facilities to the farmers for developing the level of wood cultivation.

Asareh (2008) believed that bank loans are undeniable necessity to reach the sustainable accessibility to materials. Alipour and Gorji Mahlabani (2008) stated that bank loan is the only way supporting the development of wood cultivation. Aminpour (2008) believed that loans are necessary for the development of wood cultivation. Vatani and Davanloo (2008) stated that the main problems of executing wood cultivation projects are the financial and credential problems and the problems of taking these loans from banks. Manzoralajdad and Najafi (2008) believed that cooperation between banks and paper and wood industries by giving low interest or interest-free loans in order to pay a part of the spruce production cost is a basic and fundamental step of sustainable wood material supply for the country's wood and paper industries; this study confirms the mentioned issues.

With reference to the negative effect of the first area under cultivation and the development level of spruce cultivation, first area under cultivation had a reverse effect on the development of spruce cultivation. It can be

concluded that farmers having more area under cultivation are not motivated to increase the area under cultivation for spruce and there is a financial, work force, time, and other limits for each person to develop the spruce cultivation, too.

In addition, Saremi (1992) believed that having more land affecting the adoption of agriculture innovation. Hwang *et al.*, (1993) stated that the reduction of spruce cultivation is due to the lack of flat lands for spruce cultivation. Louis *et al.*, (1999) believed that factors such as farm size and production level affect the adoption. Ramandhan (2003), in his study about the economical and social factors affecting the forestry acceptance, showed that there is a significant relationship between farm size and acceptance.

With reference to the positive effect of the first year of cultivation and the development level of spruce cultivation, because factors such as whether conditions, loan allocation, agriculture inputs, and etc have effect on the development level of spruce cultivation, thus, in the first year of cultivation, these factors, if available, would affect the development level of spruce cultivation.

Based on this study's findings and the positive relationship between the first year of cultivation and the development level of spruce cultivation, improving the knowledge level of farmers, by holding extension and educational courses, visiting the superior farms, sending educational packages, and informing through media and press, is suggested. More necessary tools and equipments should be allocated to farmers with less experience so that the level of spruce wood cultivation would be more developed. It is suggested that government efforts to allocate governmental facilities and loan to farmers and make suitable and proper policies resolve the problems and administrative bureaucracies such as introducing trusty surety and having official documentations which make serious problems for the region's farmers.

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