Journal of Biodiversity and Environmental Sciences (JBES)
ISSN: 2220-6663 (Print) 2222-3045 (Online)
Vol. 4, No. 4, p. 327-336, 2014
http://www.innspub.net

RESEARCH PAPER OPEN ACCESS

Evaluation of the socio-economic consequences of multipurpose forestry plan in Dehdez region, south west of Iran

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Article published on April 28, 2014

Key words: Economic evaluation, social evaluation, forest protection, Dehdez, Iran.

Abstract

In recent years, the comprehensive plan of Zagros forests protection has been widely described in natural resources fields as a basic concept in forest conservation, revival and development. The protection plan of Dehdez is one of the conservation and protection plans of forest which has been conducted since 2003 in north east of Eizeh city in Khuzestan province. The objective of this research was to evaluate the socio-economic status of woodman in plan. So, for this purpose the effects of plan on improvement of engagement and income, reduction of the use of forest fuels, reduction of livestock number in forest, families and migration were assessed. In this study the data collected in two different times (before and after of plan conducting) were compared to each other and then the differences caused by the conducting each of activities in region were determined. In the next step their valuation was determined in socio-economic point of view. Two main methods including field survey and attributive method were used to collect data. In attributive and library method, required data was obtained from plan hand book and other existence documents. In field survey, data were collected through different methods such as dialogues. The main tool for this was questionnaire. Lack of engagement production and improvement of people life was the most important problems of plan. The plan was successful in reducing the use of forest fuels and livestock number in forest.

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Introduction

The forest as a renewable source is valuable and important in different socio-economic and cultural aspects. So, the utilization from this source must be logic and correct (Haghverdi, 2004). In twenty century the forest management was developed by increasing human knowledge about vital role of forests in life and increasing public concerns about forest future. The main part of forest management activities was carried out in developed countries, while this activity in under developing countries was not too much. According to FAO about 9.8 million square kilometer of forests are under management plans which of them 86% was conducted in Russia, northern America and Europe and only 14% was conducted in under developing countries in Asia, Africa, Latin and central America (WRI/LIED, 1986).

Protection of forest and rangeland is a policy and guideline which indicates the level of attention in managing of natural resources. Moreover, protecting of natural resources as a public wealth is unavoidable and it need to have public efforts (Razaghi, 2003). Zagros vegetative region includes 20 percent of Iran. This region is considered as strategic region because of the different social, economic and politic reasons. Zagros forest with an area of 5 million hectare covers 11 province of Iran and improves climate quality, water supply, and socio-economic balance in region. The socio-economic condition of this vegetative region causes to increase dependence of people to forest resources to solve life problems (Pirzadian, 2008).

Zagros forests were severely manipulated and affected by human activities (Jezirehi and restaghi, 2003). In spite of the forests and rangelands organization of Iran has introduced the Zagros forests as a protective forest; the conventional harvestings to supply life requirements in local communities is current across approximately total area of the Zagros forests. So, in this region a kind of local knowledge about forestry has been formed (Ghazanfari, 2004). In accordance with the economic structure of woodman communities in west of Iran the revival of Zagros forests is difficult and in many cases is impossible. The life of people in this region is complex and hard and is depend on agriculture and cattle. The lack of engagement, increasing population per area and lack of economic development causes to increase dependence of people to forest resources. Thus, people to solve the life problems should be more active (Fattahi *et al.*, 2000).

During centuries the human and ecologic components of this region have been combined to each other. Beside, the conventional institution structure in this region produced problems in policy and management of natural resources. So, the planning of comprehensive policy and management in natural resources is necessary for this region. In addition, based on systematic view of nature, it is necessary to plan a politic aim for management of forests in contribution of human and ecologic components in this system (Shamekhi, 2007). Forestry and management in Zagros forests is depend on social issues and relation between people and nature. Conventional harvesting by local people of Zagros forests has produced a powerful relationship between human and nature of Zagros Mountains. Local people use conventional management of land for providing provender, fuel wood and life requirements (Ghazanfari *et al.*, 2004).

In recent decades, different managements were carried out in these forests. The only management in Zagros before 1962 and Iranian forests nationalization was traditional management. Management of Zagros forest using scheduled plans was began in early of 1970s. In three recent decades, several periods of different plans such as collier plans (plans which carried out in specific areas with high coverage to provide required coal of local people and forest thinning) has been conducted for managing these forests (Fattahi, 2000). The comprehensive forestry plans (this plans in limited time and area were conducted in Zagros to provide management

maps and close sensitive areas from 1989 to 1996-Fattahi, 2005) and the plans of forest resources management with aim of organizing cattle grazing and creation of supplement activities were conducted with contribution of local people (Yachkaschi, 2002). Main parts of these operations were conducted incomplete because of the defects of these plans such as imbalance between operational programs and budget programs in management and programming organization.

In addition, lack of the place table for performing project of plans and inattention to reducing programs of destruction factors in forests causes plans not to be helpful in economic point of view and management requirements of Zagros forest because of the high level of operation and lack of performer. Multipurpose forestry plan in protection and development of Zagros forests as a public plan was carried out in 11 province of Iran in 2003. The social, economic, natural and environmental factors were considered in this plan to remove the problems of management programs in Zagros forests and to provide a comprehensive program for sustainable management of forests (Pirzadian, 2008).

Therefore, for optimum management of natural resources it is necessary to use the plans in which all of the requirements of local people are considered. The first step to develop these regions is to remove the poverty of human settled in forest (Adeli, 2007). The pressure on forest resources deceases with decreasing poverty. Moreover, the poverty decreases with developing forest resources (fisher, 2004).

The protection plan of Dehdez is one of the conservation and protection plans of forest which has been conducted in north east of Eizeh city in Khuzestan province. This study attempt to evaluate the successfully rate of multipurpose forestry plan of Dehdez in achieving considered aims and improvement of socio-economic status if villagers. In this research the socio-economic effects of plan on improvement of engagement and income, reduction of the use of forest fuels, reduction of cattle number in forest, families and migration were assessed.

Material and Methods

Description of the study area

Multipurpose forestry plan of Dehdez which it operational activities has been started from 2003 is located in north east of Eizeh city in south west of Iran. According to hydrology classification of Iran, the plan area is a part of Persian Gulf watershed and is limiter to Karoon river watersheds. The study area with an area of 55312 hectare and 58 conventional orders is located in longitude 50° 08′36″ to 50° 26′49″ E and latitude 31° 33′36″ to 31° 53′12″ N (figure, 1).

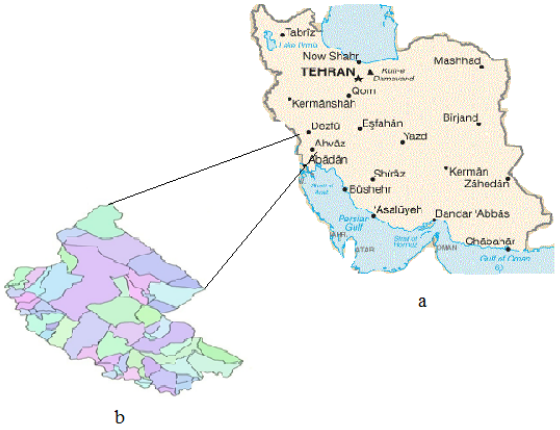

Fig. 1. a- Map of Iran, b- study area.

The minimum and maximum elevation at sea level was 700 meter and 3100 meter, respectively. The mean precipitation of the area is 549 mm. The area of the protection plan of Dehdez forests is 44547 hectare which is about 87% of the total area. The forests in plan area include plant species of the Zagros and Iran-Tooran vegetative regions as well as gulf-Oman vegetative regions in southern parts. The social structure of the area is tribe and has villager and phyle settlements. Ecological diversity in the area, existence of mountainous rangelands and/or low elevation plain, difference in temperature and other natural factors persuade tribe and immigration life in the region and nowadays is observed in most of the

area. The people always had related to nature and supplied their requirements from environment. The economy in this region is depending on agriculture and cattle because of the problems in water supply and lack of adequate flat area for agriculture.

Research method

In this research three conventional orders including Ghaleehsardiha, Koolak and Ghaleehche, which the operational works of plan has been conducted in these area and the geographical conditions of them was similar, was selected as study area. Two main methods including field survey and attributive method were used to collect socio-economic data. In attributive and library method, required data was obtained from plan hand book and other existence documents. In field survey, data were collected through different methods such as dialogues with local people. The main tool for this was questionnaire.

In this research the number of families was 60 with population of 334 people from three villages of Chlisad, Sarragkhajeha and Ghaleehche located in tree mentioned orders. Sampling was randomly conducted in three mentioned villages. The sampling intensity for Chlisad (63 families), Sarragkhajeha (78 families) and Ghaleehche (16 families) were 40%, 30% and 75%, respectively. After the completion of questionnaires, the significant variations in income rate, fuel consumption, and literacy and migration status were analyzed as indicators of the performance of mentioned forestry plan using statistical test of "a population mean test" in SPSS software.

Moreover, the rate of migration was calculated by dividing the difference between the number of accepted migrants and send migrants to total number of families. In order to convert the wood to coal, it was assumed that each tone coal is equal to 6 m3 wood and the weight of each cubic meter of wood is 660 kg. So, the calculations were done after the obtaining wood volume and converting it to coal as well as by considering the price of each kg coal.

The income and costs had been calculated in that year, so the indicator of prices or price indicator of consumer achieved from central bank of Iran was used to remove the inflation and show the real values. Following formula was used to calculate the real income and costs (Rahmani, 1999).

$$p_A = \frac{\mathrm{I_f} \times \mathrm{P}_t}{I_t}$$

Where PA is equal to real value in base year, Pt is a value in year of t, It is the indicator of prices in year of t and If is the rate of price indicator in base year. In this study the year of 2004 was selected as base year. The rate of indicator in base year is 100.

Results

The rate of fuel consumption by families

The regional studies before the plan operation showed that the fuel consumptions of people in forest resources of study area were provided from the trees foliage, dry wood and coal. So, these are the main reasons of forest destruction in region (Anonymous, 2003). The mean of wood consumption for each family was 4.91 cubic meter per year which this value decreased to 1.17 cubic meter per year after the plan operation. Thus, the rate of fuel consumption before the plan operation in studied orders was 194750 kg which is equal to 48 ton coal with price of 10520 dollar. After the plan operation, this value decreased to 64000 kg or 12 ton coal with price of 2290 dollar. Results also indicated that 51 families used the wood fuel and 9 families used the fossil fuel to produce heat and cooking, before the plan operation, whereas the fossil fuel and wood fuel consumption was respectively observed for 46 and 14 families, after the plan operation. Results of the statistical analysis showed that there was significant difference at probability level of 0.05% among the means of statistical populations before and after of plan operation (STD=.90743, mean=1.2956) (Table, 1).

Table 1. ANOVA of household consumption of firewood.

	Test Value = 4.91					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Firewood	-29.270	53	.000	-3.61444	-3.8621	-3.3668

Livestock status

According to the numbers of families and population, the maximum number of Livestock was observed in Sarragkhajeha. The goat was more than that of other Livestock. The studies before the plan operation showed those in average 37.2 little Livestock and 2.53 big Livestock was pertain to each family. In other words 39.4 Livestock were recorded for each family before the plan operation. The total number of Livestock was 2104 before the plan operation. The studies after the plan operation showed that there are 1076 little cattle and 69 big Livestock in mentioned. In average 19.2 little Livestock and 1.4 big Livestock was pertain to each family. There are 247 sheep and 829 goats in village which the ratio of goat to sheep is 3.3. This ratio was 4 in beginning of plan. 20.44 Livestock were recorded for each family. Results of the statistical analysis showed that there was significant difference at probability level of 0.05% among the means of statistical populations before and after of plan operation in villages (STD=24.093, mean=19.08) (table, 2).

Table 2. ANOVA of the number of livestock.

	Test Value = 39.4					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Number of livestock	-6.532	59	.000	-20.317	-26.54	-14.09

Net income and it capitation

Before the plan operation the net capitation of monthly income in Chlisad, Sarragkhajeha and Ghaleehche villages were 94 dollar, 57 dollar and 52 dollar, respectively. After the 7 years of plan operation these values were respectively 129 dollar, 79 dollar and 76 dollar Euro for Chlisad, Sarragkhajeha and Ghaleehche villages (Figure2).

Results of the statistical analysis showed that there wasn't significant difference at probability level of 0.05% among the means of statistical populations before and after of plan operation (STD=1.34827, mean=10126092.48).(table, 3).

Table 3. ANOVA of the annual net income.

	Test Value = 7824240					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
annual net income	1.345	61	.184	2301852.483	-1120284.75	5723989.72

Investigation of the migration status

The results of this research showed that approximately 10% of the questioned people were the families which migrated from other villages to our studied village. The most of the migration was observed in 2004 because of the inauguration of Karoon 3 dam. These villages located around the mentioned dam and the settlements and agricultural lands may be ducked after the water filling in dam. Thus villagers had to migrate permanently to studied villages. One family from the Kalimalak village migrated to Chlisad village and three families migrated to Sarragkhajeha. Two of these families migrated from Gooder village because of the lack primary facilities such as educational facilities, water, gas and electricity. In beginning of revolution one of these families migrated to this village because of the flood. In addition, two families migrated from Haji kamal village to Ghaleehche village.

Moreover, investigation about the tendency of people for migration from villages to city showed that 8 families of 60 families want to migrate to city which 6 of them come from Ghaleehche village. The main reasons of this migration were the lack of educational facilities and income sources. One family from Chlisad and one family from Sarragkhajeha want to migrate to city without any reason (Figure 3 and 4).

The dimension rate of family

The family dimension in studied villages of Dehdez protection plan as compared to national level and/or rural level of Iran, which is 4.36 people, was high. The studies before the plan operation showed that the mean of family dimension was 6.26. The studies after 7 years of plan operation indicated that the mean of family dimension was 5.01. So, the family dimension decreased 20%. Figure 4-2 shows that the family dimension in three studied villages was more than that of ideal dimension (4.36 people). Moreover, the maximum dimension of family before the plan operation was observed in Sarragkhajeha village. The family dimension in this village in year of 2003 was 6.93 people which decreased to 5.39 people in 2010. The family dimension in Chlisad village decreased from 6.40 people to 4.72 people which were the maximum reduction in family dimension. Moreover, family dimension in Ghaleehche village decreases from 5.40 people to 4.92 people which were the minimum reduction in family dimension. Family dimension in studied villages in different years as compared to country dimension (Figure, 5).

The investigation about population growth in studied villages showed that since 1996 the population rate decreased (Table 4-1). The main reason of this reduction was the population control programs, migration, and construction of hygiene home and other policies in family arrangement (Anonymous, 2003). Moreover, the investigation about migration rate indicated that the rate of migration after the plan operation in these villages was 3.3% in 2010.

Investigation of the engagement production through plan

Results showed that in Dehdez forestry plan 6.6% or 4 people engagement including shrub cutting, sentry and digging was produced. Engagement and improvement of people life are as main objectives of plan. The most important predicted programs for engagement production in plan were:

1-Bee nurture plan has been predicted to engagement production, restitution of a part of economic damage caused by forest closing and reduction of economic dependence of region to cattle in economic units (This plan has not been conducted).

2-A sentry in economic unit has been predicted To conduct conservation projects with a aim of preventing cattle entry to region, prevention of trees and shrub cutting in forest and prevention of harvesting in protected area (This plan has been conducted).

3-There are beautiful regions In Dehdez forestry plan including Lake of Karron 3 and 4, mountainous area, beautiful forests and springheads in mountainous area. So, the recreation programs can be predicted for this area. It has been predicted that for each tourism an engagement is produced directly and indirectly (This plan wan not successful).

4-In section of operational forces which carry out revival projects such as forest development, enrichment and control will provide by private section. These forces will be formed by local factors with priority of native harvesters. Recruitment of operational forces causes to produce engagement and improve economic activities and consequently develop contribution of local community in project operation. The required budget for recruitment of operational power had been predicted in cost of different projects and economic estimations. Research findings show that plan was not successful, because the local forces of villages were used less.

Discussion

Significant reduction in firewood consumption by families was occurred as result of plan operation. Indeed, protection plan of Dehdez in our study area causes to decrease (in average 3.74 m3) the annual consumption of wood by families. The reduction of mean wood consumption in Chlisad village was too low because of the piping operation for gas. This showed that operation of fueling plans have significant effects on reduction of forest fuel consumption.

The significant reduction in construction consumption of wood by families was observed after the plan operation. Replacing of forest fuels by fossil fuels was the most important program of plan which was successful. Several fuel stations were constructed by general office of Khuzestan natural resources in Chlisad and other villages which attempts to provide oil and gas of villagers. Therefore, the wood consumption by each family decreased from 4.91 m3 before the plan operation to 1.17 m3 after the plan operation. Karami (2007) and Derikvandi (2008) found that plan operation causes to decrease forest fuel consumption. Shaeri and Hosseini (2000) reported that providing replacement fuel for families was effective factor in success of plans.

Providing necessary fields for conversion of low productive and steep lands to fertile lands was the main program of plan. So, many attempts were done to improve villager's skill and ability in tree planting operations. According to our findings, the tree planting plan was done only by a few numbers of men which had planted the tree in their fields and by a manager from a village with low wage in short period. Lack of engagement for villagers was a main reason of failing this plan. Derikvandi (2008) and Mansorian and Mohamadi Golrang (2007) found that project operations hadn't significant effects on engagement rate for villagers.

The dimension rate of families in studied villages was too high. The population rate decreased in three mentioned villages especially in Chlisad village after the plan operation. Enhancement of family dimension causes to increase mental and physical pressure on family especially on warden of family, because the warden of family should provide food, education and cloths. So, the life condition will difficult and the migration increases. Indeed, in traditional economy of mountainous and valley villages, the balances between biological resources and population has disturbed because of the population increasing.

If the population of the village increases suddenly due to increasing offspring and decreasing morality, the villagers would migrate because of the economic problems. In mountainous and valley villages of Iran the migration rate was the most in recent mid century (Anonymous, 2003). This continues until the balance between economic abilities and population rate is occurred. This was proved for the mentioned villages.

The most important reasons of migration in this region was lack of relations between population growth and potential facilities in first time and facilities in the region in second time. The shortage of didactic and sanitary facilities and shortage of income resources in village were the main reason of migration. Moreover, the economic, social and cultural factors in relation to structure rural tribe community had significant effect of migration intensity. Limitations in development programs because of the inflation in some of programs such as services, providing agricultural lands and cattle shopping are the other problems beside the migration. In all of the projects of protection plan a little attention was concentrated from managers to local peoples of studied villages. The management level was only prepared by the experts of forests organization and then enounced to natural resources offices of provinces. The protection plan is a contribution plan and must be questioned from local people.

Zarnegar (1997), Pirzadian (2008) and Kalantari (1993) found that contribution of local people in step of planning and decision making causes to increase their activities in plan operation and reaching to considered aims. Yavari *et al*., (2007) reported that without contribution of local communities in planning process of natural resources protection plan causes to deficiency of plan, despondency of local people, lack of task sense in protection of it and problem in plan acceptance. The findings of recent research showed that the success of plan operation in reduction of cattle number in study area. According to the suggested programs in the plan, the engagement production and economic income couldn't be successful because people didn't contribute in plan production.

Enclosure operation and conservation facilities to prevent livestock entry to field is a reason of the reduction of cattle number. If the purpose of plan was ejection of livestock from forest to prevent forest destruction and facilitate forest regeneration, it is necessary to provide facilities to achieve this purpose. Providing engagement and stable income for families is important. Based on findings the plan didn't attempt to achieve one purpose of plan entitled balancing livestock number in study area through submission of facilities and debt for shopping heavy cattle and selling small livestock.

The regional conditions and existence resources determine the people life. The geographical and physiographical conditions of the mountainous area causes to lack of development in villages, irregular entry of technology, lack of suitable harvesting, lack of knowledge and optimum equipments. In recent years, preventing of cattle entry to forests and reducing cattle number in region causes to decrease income rate from cattle as compare to before the plan operation. It seems that by deceasing income rate from cattle the income from agriculture increases, but this wasn't occurred.

Conclusions

The income level of families in three mentioned villages was low and the plan couldn't be successful in engagement production. So, it is recommended that contribution of people in plan is considered as main factor. Information about forestry plan is most effective method to persuade people contribution in operation of forestry plan. Also, culture making, instruction, promotion, increasing economic ability of woodman, contribution of people in programming forestry plan, financial helps, construction of small industries and cooperation institute are the other effective methods to persuade local people for contribution in forestry plan operation.

References

Adeli K. 2007. Evaluation of the forest sustainable affected by tribe forestry (Case study: ShoolAbad region in Lorestan). Journal of Iranian Poplar and Forest Research **16(1)**, 23-27.

Adeli K. 2007. Poverty, forest destruction and migration in Zagros of Lor (Case study: Shoolabad of Lorestan). Conference of the economic agriculture in Iran, 231-244.

Derikvandi F. 2008. Evaluation of the socio-economic consequents of development plan of Rimleh. Journal of Village and Development **11(1)**, 137-198.

Fattahi M, Ansari N, Abbasi HR, Khanhasani M. 2000. Management of Zagros forests (Case study: Darbadam forests in Kermanshah). Volume 1, Publication of the Research Institute of Forest and Rangelands, 320-355.

Fattahi M. 2005. The process of Zagros forests management. Monthly journal of Dehati, 32-35.

Fisher M. 2004. Household welfare and forest dependence in southern Malawi, Environment and Development Economics, Cambridge University Press **9**, 135-154.

Ghazanfari H, Namiranian M. 2004. Estimation of the diameter growth of Veyvool trees in Northern Zagros region (Case study: Havareh khool). Journal of Natural Resources **57(4)**, 649-662.

Ghazanfari H, Namiranian M, sobhani H, Mohajer RM. 2004. Traditional forest management and its application to encourage public participation for sustainable forest management in the northern Zagros mountains of Kurdistan province, Iran. Scandinavian Journal of forest research **4**, 65-71.

Haghverdi K. 2004. Investigation of the methods of estimating the volume of beech in Veisar region. Journal of Natural Resources, Volume **57**: 35-64.

Jezirehi M, Ebrahimi restaghi M. 2003. Zagros silviculture. Publication of Tehran University, 34-40.

Kalantari H. 1993. Investigation of the effective factors in contribution of villagers. MS.c. thesis. Plans and researches for study and evaluation of socio-economic. Assistant of promotion and contribution of people in study and programming office, 90-102.

Pirzadian A. 2008. Investigation of the role of local community in performing protection and development plan of Zagros forest (Case study in Kermanshah province). MS.c. thesis. Azad University of Research Sciences of Tehran, 65-80.

Razaghi M. 2003. Editor speech. Forest and rangeland Journal **61**, 4-6.

Rahmani T. 1999. Huge economy (first volume). Baradaran publications, 102-106.

Shamekhi T. 2007. Forest policy. Lesson handbook. Ph.D in forestry and forest economic field, Faculty of Natural Resources, Tehran University, 20-30.

World Resources Institute and International Institute for Environment and Development (WRI/IIED). 1986. World Resources, New York: Basic Books, 45-61.

Technical Department of the Rangelands and Forest Organization of Iran, 2010. Internal reports of the wood price production, 1-5.

Yachkaschi A. 2002. Reorganization, protection and improvement of Iranian environment. Institute of Science – Application of Agriculture organization, Tehran, 441-450.

Yavari GH, Khalili M, Mirkiaei H. 2007. Investigation of the socio-economic effects of national project of Heblehrood using PRA in Pilot village of Garmsar city (Case study: Behward village), 23-29.

Zarneghar H. 1997. In direction of human contribution to conserve and develop natural resources and village development. Assistant of promotion and contribution of people, 10-18.