

The survey of destructive effect of socio-economic activities in condition of different establishment of villages (case study: Shine area in Lorestan province)

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ABSTRACT: The purpose of this study was to examine villagers' lifestyle, their relationship with the forest, and their use from it in order to obtain villagers' dependency. This determined the exploitation of the forest and the sustainability of villages due to the deforestation. It should be noted that villages have different destructions in a different geographical location. Villages were classified on the basis of socio-economic situation with three factors: agriculture, fuel consumption, and livestock in the first step. The traditional management unit was studied in this study, because forest management unit is traditional in Zagros forests. The management unit groups that had similar height, slope, and orientation were classified in the next step. Rangeland, watershed, and forest management unit of country was compared with management unit of local people in this study. The orientation characteristic was considered as a variable in the process of study. The rate of reduction in forest cover was %0.04 in the study area on year that according to the public use of forest and the obtained figure from the reduction in forest cover it shows that forest density has reduced significantly in the area and forest density has been reduced by the public use of forest., forest area is also reduced following density reduction so the compensation will be very difficult. Also, the results of this study showed that destructive effects on livestock was greater than effects of other livelihood activities in terms of villagers' fuel consumption and agriculture in the forest and rangeland.

Keywords: Sustainable development, traditional management unit, forest and rangeland, Shine.

INTRODUCTION

Forest is one of valuable resources that nature has placed at the disposal of mankind. The value of forest is remarkable in different dimensions. Forests play an important role in terms of the needs of human communities, water supply, soil conservation, and flood prevention. As well as forests play an important role in terms of oxygen production and absorption of carbon dioxide in the environment so that tropical forests that are distributed around the equator orbit have been called as lungs of the Earth. Forest has offered various services for human society in human history. The most important forest service is its economic role in the livelihood of the people and as a life platform for human societies (Adeli, 1975). Forests have been distributed differently on Earth due to the inequality of water and climate. Forest has covered Less than 1/3 of the Earth's space. Only a little more than 50 countries have natural forests among the more than 200 independent countries in the world (Zareh, 1999). Iran has been poor in terms of forest cover because it is the dry belt of the world. It is among the last countries that have forest (Velayati, 2006). Although Iran is one of the poorest countries in terms of forest, but the value of forests increases due to the

existence of high biological diversity in these forests. The discussion on sustainable development has been raised as a fundamental debate in scientific communities in recent years. The role of forests is an essential role as part of the environment around us on the issue of sustainable development. The sustainable development of forest means the multiple socio-economic and environmental values that ensure the unlimited and without the damage maintaining, revitalization, the maintaining of the ability to generate, and the discussion of species and ecological diversity of forest ecosystems. So, the discussion of coordination of human activities and forest biological activities of forest is a fundamental issue in the sustainable development of forests. The specifying of conditions that have the least destructive effect on forest and the development of rural areas can be considered important steps in the sustainability of the forest because there is a close relationship between rural communities and forests as well as the effect that villages have on the forest. We can say that forest dwellers and villagers' life have close relationship with natural resources in Zagros area and any change in these forests and rangelands will has a great effect on the livelihoods of local residents in these regions. Wood is used for fuel and energy and rangelands and forest lands are used for livestock feed, and lands under the forest understory are used for agriculture in many parts of the Zagros. Residents cut oak trees for agriculture in the forest understory. Oak trees have high grow and those continue to grow as ramets that this has caused difficulties in regeneration of trees of area. Today, tree felling is much less than in the past but, the density of tree with seeds dropped in the region so that the revitalization of these forests is a serious problem. We have tried to study the effects of the villagers on forest and their dependency on forests in this study to identify regions with less degradation that those are sustainable regions. The purpose of this study was to examine the destructive effect of socio-economic activities in different conditions of village establishment by relying on location features. The survey of villagers' lifestyle, their relationship with the forest, and their use from it identify villagers' dependency. The research hypothesis should be proven according to the exploitation of the forest and that the selected villages were deployed in a different location. The Research hypothesis is as follows: destructive effects of human socio-economic activities on villages that were located in a suitable place are low and those have the greater stability. If this hypothesis is proven and is determined sustainable regions will be an important step in the sustainable development of region. Shine has 234734 hectares and is located in Delfan and Selseleh cities with geographic location 41°-47' to 48°-05' eastern longitude and 33°-40' to 33°-55' northern latitude so that the large part that has the region 43.24786 hectares is located Selseleh city and its 77.9947 hectares is located Delfan city. Shine region is located in the southwestern of Selseleh and in the southeastern Delfan city. The located part in Selseleh city is a part of Firouzabad in terms of political divisions and the located part in Delfan city is a part of Mirbak rural district. Shine region has a variable weather and it had the colder weather and is cold mountainous in the south and west parts that have more height and other areas have a temperate climate. The study area is divided into 28 traditional management units.

Table 1. The area and location of different traditional management units in Shine area

Row	Name of unit	unit area (hectares)	Political situation		Name of villages and population centers in Unit
			City	Part	
1	Zivar	43.3069	Delfan	Central	Zivar and Seyed Fazel
2	Gerdkane	71.1576	Delfan	Central	Gerdkane
3	Rezavis	80.825	Delfan	Central	Rezavis
4	Azizabad	48.1400	Delfan	Central	Azizabad
5	Khodaverdi	80.217	Delfan	Central	Khodaverdi
6	Sar Shine	56.422	Delfan	Central	Shine
7	Sar Marang	79.1062	Delfan	Central	Sar Marang
8	Ganjdareh	88.1369	Delfan	Central	Ganjdareh Olya and Sofla
9	Varnamad	2.1129	Selseleh	Firouzabad	Varnamad
10	Shahilan	22.961	Selseleh	Firouzabad	Shahilan
11	Bijanvand	26.1730	Selseleh	Firouzabad	-
12	Shine	48.1297	Selseleh	Firouzabad	Shine Olya, Vosta, Sofla, and Eshaqabad
13	Cham Gabrestan	02.1081	Selseleh	Firouzabad	Cham Sorkkeh and Chamgabrestan
14	Cham Shahi	07.1200	Selseleh	Firouzabad	Cham Shahei and Vanab
15	Cham Shateh	02.284	Selseleh	Firouzabad	Cham Shateh-ye Sofla
16	Lalabad	00.1473	Selseleh	Firouzabad	Lalabad
17	Cheshmeh Tala	63.518	Selseleh	Firouzabad	Cheshmeh Tala
18	Saranjeh	99.753	Selseleh	Firouzabad	Saranjeh
19	Adlabad	88.3137	Selseleh	Firouzabad	Adlabad
20	Zaringolam Qolayi	5.167	Selseleh	Firouzabad	-
21	Tudar, Doroshtdar, and Dideban	04.1480	Selseleh	Firouzabad	-
22	Cheshme Qanbar Ali	22.1399	Selseleh	Firouzabad	Cheshme Qanbar Ali
23	Cham Sorkkeh	84.232	Selseleh	Firouzabad	-

24	Sardab	74,5224	Selseleh	Firouzabad	-
25	Alikhan	63,220	Selseleh	Firouzabad	Chal Sabz
26	Cham-e Gorgali	64,648	Selseleh	Firouzabad	Cham-e Gorgali
27	Kalkestan	58,567	Selseleh	Firouzabad	Kalkestan
28	Vazm	55,1147	Selseleh	Firouzabad	-
29	Total	34610		Firouzabad	

MATERIALS AND METHODS

Methodology

The purpose of this study was to examine the destructive effect of socio-economic activities in rural areas on the forest. Therefore, this study should be performed in forest villages. Thus, Shine area in Lorestan province with an area of 2.34734 hectares was selected for this purpose. The villages that had the same conditions in for the socio-economic activities, but had differences in terms of topography have been examined in this study and the most stable region was determined. This study was conducted in four stages as follows:

- The first step: the classification of management units on the basis of socio-economic conditions with the basic information that was available for the region as well as with the collected information by researchers from the region. The selection of the same management units with a consideration of this fact that the management units group was in selection priority that had many villages. The purpose of the classification at this stage was that management units were classified in separate groups on the basis of the type of livelihoods and socio-economic activities. Management units were examined in terms of agriculture, livestock, and fuel characteristics at this stage. Information from the interpretation of aerial photos were used for the calculation of agriculture lands in addition to the direct observations and questions from residents.
- The second step: The classification of management units on the basis of location characteristics (height, slope, and orientation) that this step was done by the ArcGIS software. The digital maps of the region that was borrowed from Department of Natural Resources in Lorestan province was used for this purpose. The height, slope, and orientation were prepared with the help of these maps. The basis of study was on selected management units at this step. The selected management units group was re-classified on the basis of location conditions of establishment at this step. As a result, it was divided into two sub-groups. This group was re-classified at this stage because all management units had the same socio-economic conditions at this stage. In fact, those belonged to a group, so the term of subgroup was used.
- The third step: new obtained sub-group of management units in the previous step were examined by questionnaires at this stage. The village questionnaire was designed in seven categories (including: general, social status, fuel consumption, agriculture, the status of livestock, the situation of byproducts, and village facilities). This questionnaire was completed with interviews of villagers in every management units.

The fourth stage: the quantity and quality of forest around selected sub-group of management units were examined at this stage. Aerial photos of the two time periods were needed for this purpose that Photos of 2002 was borrowed from the Forest, Range, and Watershed Management Organization of Iran and photos of 1955 was purchased from the Armed Forces Geographical Organization of Iranian. The survey of the quality of forest was done by the viewing area and questions from villagers. The quantity of forest was examined through the interpretation of photos by the ArcMap-ArcInfo software. The forest area was closed polygons in this method and was developed from other sides in the separated management unit.

RESULTS AND DISCUSSION

Results

1. The classification of management units on the basis of socio-economic conditions:

Management units were classified in agriculture, livestock, and fuel consumption characteristics in three categories (high, medium, and low) according to the villagers' dependency on forest and rangeland at this stage.

- 1-1- The classification on the basis of agricultural factor:

The area of agricultural lands were calculated by separate management unit according to aerial photographs and Digital maps of the area in 2002 and ArcGIS software. Corrected and geo-referenced aerial photos were used for this purpose by a high software. The area of management units that was done by overlays of map of the traditional management units of the region on aerial photographs was interpreted on the computer. Forest area was identified and its polygons was closed and developed. The level of agricultural lands (%0.03 and %8.90) were divided in three groups with regard to the lowest and highest percentage for this purpose as follows:

The first group: management units by the percentage of agricultural lands between %0-%3

The second group: management units by the percentage of agricultural lands between 3- 6%.

The third group: management units by the percentage of agricultural lands between 3-9%.

Management units were classified in three different categories according to the above groups. The first group on the third category was the rate dependency on forest and pasture more than 70%. The second group on the second category was the rate of dependency on forest and range between 30-70%. The third group on the first category was the rate of dependency on forest and range between 0-30%. It is assumed in this classification that if the lower level of agricultural lands have more dependency on forest and range. It means that the higher level of agricultural lands in a management unit have less dependency on forest and the people of this management unit require less natural resources around this management unit to meet their needs.

1-2- The classification on the basis of fuel consumption factor:

Management units were classified in three categories according to the obtained data from fuel consumption and the status of livestock in area and the survey of villagers' use of grassland and forest surrounding villages. The basis of the classification is as follows: Management units that provided their fuel from the surrounding forest and pasture (in the form of firewood from the forest trees) were in the third category that the rate of dependency on forest and rangeland was more than 70%. Management units that used fossil fuels (oil and liquid gas cylinders) in addition to firewood were in the second category that the rate of dependency on forest and rangeland was between 30-70%. Management units that used fossil fuels were in the first category that the rate of dependency on forest and rangeland was between 0-30%.

1-3- The classification on the basis of livestock factor:

The basis of the classification for the status of livestock is as follows: Management units that used the forest and pasture for their livestock feeding around the village were in the third category that the rate of dependency on forest and rangeland was more than 70%. Management units that used the residue of their farms in addition to the forest and pasture for their livestock feeding around the village were in the second category that the rate of dependency on forest and rangeland was between 30-70%. Management units that used the residue of their farms and, if necessary, those purchased fodder from the respective centers (Department of Agriculture) for the feeding of their livestock were in the first category that the rate of dependency on forest and rangeland was between 0-30%. Management units of area were classified in 11 groups on the basis of agriculture, livestock, and fuel consumption factors. The first management unit group was selected as the study group. Then the selected management unit group was classified according to the location characteristics (height, slope, and orientation) and the fact that a characteristic that has the greatest similar is a priority for classification and two new subgroups was obtained.

The first management unit group: Zivar, Cham Gabrestan, Lalabad, Cheshme Qanbar Ali, and Cham-e Gorgali

The second management unit group: Rezavis and Azizabad

The third management unit group: Cham Shahi and Cham Shateh

The fourth management unit group: Gerdkane and Khodaverdi

The fifth management unit group: Sar Marang and Ganjdareh

The sixth management unit group: Cheshmeh Tala and Saranjeh

The seventh management unit group: Alikhan and Kalkestan

The eighth management unit group: Sar Shine

The ninth management unit group: Shahilan

The tenth management unit group: Shine

The eleventh management unit group: Adlabad

1-4- The classification on the basis of location characteristics:

First Management units were classified separately on the basis of three mentioned characteristics. The category area was calculated in each classification.

Table 2. The classification of management units on the basis of location characteristics (height, slope, and orientation)

Number	Name of management unit	Slope class (percent)	Height class (meter)	Orientation class
1	Zivar	30-60	2100-2600	S/N
2	Cham Gabrestan	0-30	1340-1800	S
3	Lalabad	0-30	1340-1800	N
4	Cheshme Qanbar Ali	0-30	2100-2600	W
5	Cham-e Gorgali	0-30	1340-1800	S

Zivar management unit is removed in the first stage classification on the basis of slope characteristic. Four management units with the same slope and one management unit with the different slope from other management units, so a management unit with different slope will be removed. The second stage of classification was done on the basis of the height characteristic in the second stage. Cheshme Qanbar Ali management unit (with different height) is removed. Finally, two subgroups of new management units were as follows:

Table 3. The first subgroup of management unit

Number	Name of management unit	Slope class (percent)	Height class (meter)	Orientation class
1	Cham Gabrestan	0-30	1340-1800	S
2	Cham-e Gorgali	0-30	1340-1800	S

Table 4. The second subgroup of management unit

Number	Name of management unit	Slope class (percent)	Height class (meter)	Geographical orientation class
1	Lalabad	0-30	1340-1800	N

These two subgroups are similar in height and slope characteristics with similar socio-economic conditions, but those are very different in orientation characteristic. Geographical direction is a variable location characteristic in this study. These two subgroups of management unit were comparable in the three states. The first state includes two management units of the first subgroup. The second state includes management units of the first subgroup with management unit of the second subgroup that this state (Cham Gabrestan management unit with Lalabad management unit, Cham-e Gorgali management unit with Lalabad management unit) will be done in two stages separately and it is the most important state in this study because location characteristics can be surveyed in this state. Three management units will be compared with each other in the third state. Also, the forest level was surveyed by aerial photos in the two time periods in these three management units.

- The third stage: the survey of villagers' livelihood by questionnaire

The obtained data from the questionnaire were analyzed in agriculture, livestock, and fuel consumption parts.

Table 5. The level of agricultural lands in management units (hectares)

Number	Name of management unit	Household numbers	The total level of management unit	The level of gardens	level of agricultural lands		
					Total level	The level of dry lands	The level of irrigated lands
1	Cham Gabrestan	27	02.1081	5.8	135	120	15
2	Lalabad	49	00.1473	10	70	40	30
3	Cham-e Gorgali	20	64.648	35	150	120	30
4	Total	96	66.3202	5.53	355	280	75

Table 6. The fuel consumption in the level of management units

Number	Name of management unit	Household numbers	Fuel consumption	Consumption in year
1	Cham Gabrestan	27	Firewood	7344
2	Lalabad	49	Firewood	13328
3	Cham-e Gorgali	20	Firewood	5440
4	Total	96	Firewood	26112

The harvested wood from forests is 26112 loads in the year for the total of management unit that If this figure is converted to cubic meters, it will be 5.8277 cubic meters wood of the forest in the year. Every load was equivalent to 0.317 0 cubic meters for this conversion.

Table 7. The number of livestock per unit area in management units (hectares)

Number	Name of management unit	The total number of livestock	The total level of management unit	The number of livestock in total level	Forest level	The number of livestock in The level of forest
1	Cham Gabrestan	925	02.1081	85.0	1027.03	90.0
2	Lalabad	700	00.1473	47.0	1399.13	5.0
3	Cham-e Gorgali	2000	64.648	08.3	583.48	42.3
4	Total	3625	66.3202	4.4	64.3009	22.5

- The fourth stage: the survey of quality and quantity of forest around subgroup of selected management units

Also, the area of forest was calculated in the studied management units by aerial photographs in the 47-year timeframe (1955-2002). Its results can be observed in the following table (table 8). 17 aerial photographs of 2002 with a scale of 1: 40000 was prepared from the Forest, Range, and Watershed Management Organization of Iran. Those were interpreted by the ArcGis software with a scale of 1: 20000 to 1: 15000. The forest area was developed in separated polygons in from other sides in the area of specified management unit. Then, aerial photos related to 1955 with a scale of 1: 55000 was purchased from the Armed Forces Geographical Organization of Iranian and topographic maps of the area with a scale of 1:50000 was purchased from the National Cartographic Center of Iran according to the coordinates of the area. Aerial photo mosaic was prepared by maps and the border of area was transferred on photos. Then, photos without the coordinates were scanned and those were georeferenced using of orthophotos in 2002 by the ArcGis software. Finally, interpreted photos with a scale of 1: 20000 are determined forest area by n polygons and its area was calculated that its results can be seen in the following. According to the following table and forests area, the reduction of forest cover that was the first results of this study were obtained.

Table 8. The rate reduction of forest cover

Number	Name of management unit	The total level of management unit (hectares)	Forest level in 1955		Forest level in 2002		Reduction	
			Hectares	Percent	Hectares	Percent	Hectares	Percent
1	Cham Gabrestan	00.1473	1406.17	46.95	1399.13	98.94	04.7	48.0
2	Lalabad	02.1081	1039.49	16.96	1027.03	00.95	46.12	16.1
3	Cham-e Gorgali	64.648	616.98	12.95	583.48	95.89	5.33	17.5

But the closer look at the table and forest area on mentioned the date and a consideration of this fact that villagers have full use of the forest around them reveals that forest has a good stability in these management units. It is slightly reduced rate with the socio-economic conditions prevailing in the region with the dependency of more than 70% on forest and rangeland.

Table 9. The reduced rate of forest cover in year

Number	Name of management unit	The total level of management unit (hectares)	Reduction		Reduction in year	
			Hectares	Percent	Hectares	Percent
1	Cham Gabrestan	00.1473	7.04	0.48	0.15	0.10
2	Lalabad	02.1081	12.46	1.16	0.26	0.02
3	Cham-e Gorgali	64.648	33.5	5.17	0.71	0.11

The results in table (9) showed that %0.047 of forests area reduced in the study area in the year. The rate of reduction of forest area Cham-e Gorgali was more than the two other management units (%0.063 per year).

Discussion and conclusion

The purpose of this study was to survey the destructive effect of socio-economic activities in condition of different establishment of villages. The selected village group with the same socio-economic was divided into two subgroups on the basis of location characteristics in the study that the orientation characteristic was a variable characteristic. The results of this study showed that there was differences between villages of these two subgroups. This can be due to similar conditions of forests in these management units because the height above sea level characteristic that has great importance in the release of plants, limitations of the spread of the species and forest communities, and the lack of a species or a plant community (Mohajer, 2005) is the same in these management units. The slope characteristic that has great importance in access to forest resources and its use for agriculture and livestock is the same in these management units. The only created difference in the area is due to a different direction (north and south) that this difference makes a difference in air humidity and soil, so it has affected on soil fertility. Thus, forest is different in two mentioned directions so that it has better condition in the north. The survey of orientation characteristic in this study showed that forest had a better condition in the north so that its level had less reduction as well as its quality was better than the other two management units that were in the south. The number of livestock has significantly relationship with the forest destruction so that greater number of livestock had more forest destruction in management units. Also, the use of forest and pasture for livestock had more destructive effects than other uses such as the supply for residents' fuel. The results of this study showed that socio-economic activities had destructive effects on forest and rangeland that these effects was more in the field of livestock than two other fields. Also, destructive effects were less in fuel consumption that this could be due to more favorable conditions of forest in the north. This study confirms many destructive effects of livestock on forest and rangeland. It seems that the organization of livestock is necessary in this region like other Zagros regions to protect the forest and pasture. The location characteristic was orientation in this study that it created less differences in forest areas than height and

slope characteristics. There was no possibility of comparison in order to study destructive effects of socio-economic activities on the basis of different condition of establishment, but this rate of change in the destruction showed that different location condition had different destructive effects with different rate of destruction.

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