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**Usage of Trees and Forest Resources at Household Level:  
A Case Study of Aşağı Yumrutaş Village from the  
West Mediterranean Region of Turkey**

<sup>1</sup>Ahmet Tolunay, <sup>1</sup>Ayhan Akyol and <sup>2</sup>Mediha Özcan  
<sup>1</sup>Faculty of Forestry, University of Süleyman Demirel,  
Eastern Campus, 32260 Isparta, Turkey  
<sup>2</sup>Directorate of Afforestation and Erosion Control,  
Ministry of Environment and Forestry, Ankara, Turkey

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**Abstract:** Forests have always been a significant resource for subsistence of forest villages. The dependency of rural societies on forest resources varies according to countries. In the past, tree and forest resources were largely used for meeting the needs of people and especially for meeting energy supplies. When we reflect on the past 25 years in Turkey, it is observed that new energy sources are being used instead of wood. The impact of this change in energy usage in forest villages is unknown. This study is carried out for the purpose of finding out what the effects are. The study was conducted in Aşağı Yumrutaş Village, located in the Western Mediterranean Region of Turkey. According to results of the study, it was found that today the villagers are still quite dependent on trees and forest sources. Sources of trees and forest products are state forest resources, farm land, homegarden, orchard and village woodland. Modes of usage of trees and forest resources are construction materials, fuelwood, human food, medicinal plants, agricultural tools and fodder. The villagers damage forest resources from which they get their needed supplies. Forest usage activities of Aşağı Yumrutaş inhabitants have generated negative impacts on the socioeconomic status of villagers. Similarly, they bring about the same outcomes to the ecosystem. For this reason, new rural development policies should be implemented in order to meet the basic needs of people who live in forest areas and to prevent damage that these people cause to forest resources.

**Key words:** Trees and forest resources, usage, rapid rural appraisal, West Mediterranean region, Turkey

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## INTRODUCTION

Turkey has started to develop its social and economic conditions since 1963 when the planned development period was launched and she converted her mainly agricultural structure to a structure in which the sectors of industry and service are dominant. Once some of the indicators acquired in 2006 are compared with the ones in 1963; the results are as follows: The national income per capita has increased from \$542 to \$5477; the number of the villages with electricity has increased from 213 to 37 470; the rate of schooling has increased from 12 to 85% at secondary school level and from 4 to 43% at higher education level; the infant mortality rate has decreased from 158 to 22‰ and the population per physician ratio has decreased from 2666 to 717 (The State Planning Organization, 2007a, b).

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**Corresponding Author:** Ahmet Tolunay, Faculty of Forestry, Suleyman Demirel University, Eastern Campus, 32260 Isparta, Turkey, Tel: +90 246 2113153 Fax: +90 246 2371810

These economic and social developments have led to positive results. These developments are not only for the population in urban areas but also for the population in rural areas. Highly important steps have been taken for the resolution of major infrastructure problems of rural areas such as highways, running water, electricity, communication and education.

Rural development operations require intervention of the rural structure in various issues and at different periods of time in accordance with the quality of the problems identified in rural areas and the alternative resolution methods. If the rural development is considered as a process transforming the rural communities into gradually developing communities, it is obvious that the operations to be carried out in these areas are supposed to be materialized in definite application periods (Malcolm, 2003). After a rural development process is successfully completed, a new one is launched (Oakley and Garforth, 1985).

The current structural state and major social and economic indicators of Turkey confirm that the framework and the dimensions of rural development studies have altered. Through the resolution of some certain infrastructure problems, which have become more obvious in rural development operations since 1960s, the integration of rural areas with the economy of the country has been achieved to some extent. However, according to the data of 2006; 37% of the total population of 73 million live in rural areas and 29% of the workforce employed in the domestic market, earn their living from the agricultural sector (The Turkish Statistical Institute, 2007). These indicators demonstrate that the problems requiring resolutions within the framework of rural development are still on the agenda. Therefore, it is necessary to identify the issues or the areas to be studied and to add them to the agenda. In short, the rural development issues should be revised.

Under the scope of rural development operations, the state of the forest villagers living within the forest resources is slightly different. In the past, most of the hills and mountains of Turkey were rich in forest resources. At that time the population of the country was small and most of the lowlands were fertile enough for growing agricultural crops. There were not many people living around the forests. When the Celali Rebellion broke out between the years of 1550-1600 in Ottoman State, many people moved to safer areas (Akdağ, 1999). They selected forest areas for settlement (Anıl, 1974), as forests have always provided important resources for the subsistence of rural people. Trees are also significant in preserving the nutritional balance in traditional diets. A wide range of foods consumed by humans can be obtained from a variety of tree products such as leaves, roots, fruits, nuts and pods (Apichatvullop *et al.*, 1987; Gilmour and Fisher, 1991). The Celali Rebellion caused many people living in lowland areas to migrate to higher areas to find land for farming and also resulted in the destruction of forests to make land suitable for habitation and cultivation (Çağlar, 2000). Forest areas were destroyed by illegal felling for building small houses as well as for creating agricultural lands. They raised domestic animals and grazed them in the forest. As a result of a rapidly growing population and indiscriminate cultivation of agricultural lands, most of the lands became less productive which led to poor crop production. This kind of pressure on forestland resources threatens the stability of forest lands and land use management.

Today, there are no rich tree and forest resources in Turkey any longer as there used to be in the past. Forest areas which used to be approximately 40 million hectares in the past, have been reduced to only a half. Today, the forest area is now about 20.7 million hectares in Turkey. This constitutes 27% of the country's area (Konukçu, 2001) and 7.7 million hectares are occupied by or adjacent to 20 293 villages (Orkoy, 2002).

Various scientific researches have been carried out up until now on the use of trees and forests by the rural population in Turkey. However, these researches have been based on the data and the particularities of rural life of the 1970s and 1980s (Anıl, 1973; Duruöz *et al.*, 1976; Ekizoğlu, 1989; Geray and Acun, 1980; Geray, 1993). Nonetheless, there have been and there are alterations in the use of trees and forest resources in forest villages. For this reason, new scientific researches which are

based on current data need to be carried out. Once the researches are materialized on the use and management of trees and forest resources through case studies based on villages, crucial data is acquired (Apichatvullop *et al.*, 1987; Metz, 1994).

This case study has been handled on the grounds of these reasons and carried out in Aşağı Yumrutas Village. It is located in the Aglasun District, Burdur Province in the Western Mediterranean Region of Turkey (Fig. 1). The Western Mediterranean Region consists of the provinces of Antalya, Isparta and Burdur. The most underdeveloped one among these provinces is Burdur. Aglasun is the most underdeveloped district of Burdur Province. The selection of Aglasun was based on this criterion. In the district of Aglasun there are 7 villages and 2 towns. Aşağı Yumrutas Village is situated in national forest reserves and when it is compared with other rural settlements, it has a higher dependency on trees and forest resources. These are the reasons for selecting this village for this case study.

This study attempts to provide information and to determine the necessary data about cultural, physical and socioeconomic conditions of the villages, the types and species of trees that naturally grow and are planted in the farmers' fields and homegardens, how village households manage and use trees and forest resources in their surroundings and the changing patterns of the use and management of trees.

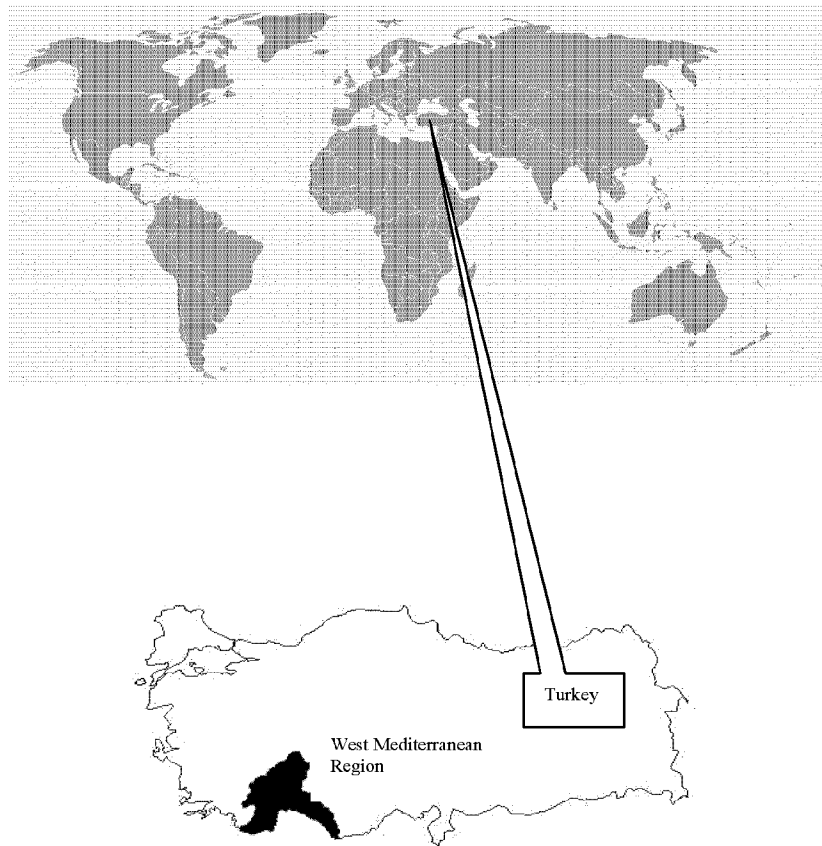


Fig. 1: Location map of study area

## **MATERIALS AND METHODS**

The study was conducted by a team composed of a team leader and two members. The study period was divided into first and second phase. The duration of the first phase started on 1st July 2007 and ended on 7th July 2007. The second phase of the study was between 22-28 July 2007.

The major method applied for this case study is Rapid Rural Appraisal (RRA). RRA is a study used as the starting point for understanding a local situation and carried out by a multi-disciplinary team (Chambers, 1987). It lasts for at least four days but not more than three weeks and is based on information collected in advance, through direct observation and interviews where it is assumed that all relevant questions can not be identified in advance (Beebe, 1987). This form of research involves casual conversation between the villagers and an interdisciplinary team of researchers. Therefore, it provides opportunities for more interaction between the informants and researchers, enhancing better learning and conceptualization (Apichatvullop *et al.*, 1987).

The team members collected and analyzed the data from three main sources by triangulation by using the RRA technique: Primary data from semi-structured interview, secondary data from existing reports and data collected by physical observation i.e., a reconnaissance survey.

Semi-structured interviews were conducted during the village visits. Key informants were selected depending on their occupation and socioeconomic status in the village. Those interviewed were the village headman, government servants and villagers. The number of persons interviewed was 20.

Secondary data of the study area was collected from governmental offices and private associations at Aglasun District. Statistical data and other useful information, which was obtained from existing reports, were studied, analyzed and also cross-checked during visits to the village to confirm their accuracy. Secondary data supplied for this study was also helpful to draw a conceptual framework for different aspects to be handled in the village.

## **RESULTS**

### **CURRENT CONDITIONS OF THE VILLAGE**

Aşağı Yumrutaş is an old settled village. According to the observation on the village graveyard, the settlement history dates back to the 1800 s. The first settlement to the village was made two hundred year ago. Nomadic people had played an important role in this process. At present the total number of households in the village is 35. At present, the total population of this village is 122 and 4 members per house on average. The smallest household consists of one member and the largest one consists of 7 members. The total number of males is 52 and of females are 70.

Aşağı Yumrutaş Village is situated on upland and on a hilly area about 670 m. above mean sea level. The North side of the village is upland, sloping gradually to the southeast. The landscape of the village is undulating with slopes of about 25-40%.

The important structures in the village are the primary school, the mosque and the village headman's office. Each household has a telephone. Electric power was brought to the village and each household uses it for illumination. Some households use it for cooking and heating. A few villagers also use solar energy for heating water. Over 98% of the houses in the village are constructed of brick. The roofs of the houses are covered by tile. They also use timber for building. Therefore, timber is an important requirement for housing construction (Fig. 2, 3).

There is no public health center in the village. If a person gets ill, the villagers usually take them to a health center in Aglasun or Isparta. About 70% of households practice family planning through the use of contraception or other birth control measures. Common diseases in this village are influenza, common colds, common fever etc. During household interviews and key informant interviews, the interviewees said that there were no major problems in this village regarding health and nutrition. Ninety five percent of households have a sanitary toilet.



Fig. 2: A typical household from the village



Fig. 3: Artificial manure from livestock and poultry in the village

About 95% of the villagers can read and write. Usually only the old people are illiterate. The primary school in the village is closed now. Since the number of primary school students is not enough, they are taken to an open school at Aglasun.

Aşağı Yumrutaş has a Mediterranean climate. It is a special type of climate that describes a regime of hot summer (drought) and winter rain in the mid-latitudes in the north of the subtropical climate zone. The average annual rainfall is 436.7 mm.

The main source of drinking water and water for household use is underground water. There is a water tank and a water network in the village. Each house is registered for water use. Sometimes, water storages decrease. In this respect, the drinking water and water for household use is not sufficient in the village.

The total land area of Aşağı Yumrutaş is 17 198 decares and 100 decares of this land is intended for housing and homegardens, 618 decares are intended for agriculture, 60 decares are unsuitable lands and the rest of the area i.e., 16,420 decares are forest lands. The village is surrounded by forests on each side. In this respect, there is no more agricultural land and it is impossible to get more land to expand the village. As a result, farm sizes range from 0.5 decare to 5 decare. Most of the agricultural lands are used for cultivation of wheat and barley. Other crops are maize and fodder plant species. In terms of yield, farmers have noticed that it is declining in the course of time. Factors such as low rainfall, continuous cropping, crop choice, machinery, low soil fertility and soil erosion are the main causes of the current declining productivity of their farmlands.

Alternative sources of income are limited in Aşağı Yumrutaş. Most of the villagers are poor. They are dependent on excessive and often destructive use of forests to provide basic needs such as wood for cooking, heating and home construction. Due to lack of agricultural land and decrease in production yields of the surrounding forests, the economic condition of the village is worsening. The villagers reported that households in the village had an average income of 4250 \$ US Dollar/per year. Given that the average number of members in a household is 4, it is seen that the annual income per capita is 1062 \$.

## SOURCES OF TREES AND FOREST PRODUCTS

### State Forest Resources

Aşağı Yumrutaş Village is surrounded by state forests on each side. There are 16,420 decares of forest lands in the village. Many tree species such as trees, shrubs and other plants are available in the forests. There are mainly brutian pine (*Pinus brutia* Ten.), Anatolian black pine (*Pinus nigra* Arnold. subsp. *pallasiana* (Lamb) Holmboe), juniper (*Juniperus exelca* Bieb.), Lebanon cedar (*Cedrus libani* A. Rich.) and some oak species (*Quercus* sp.). The villagers collect forest products from the state forest resources according to the type of products sought like mushrooms, medicinal plants, etc. Hunting is mainly done in the dense state forests.

### Farm Land

Agricultural practice refers to the growing of trees, which bear fruit and fuel/building material (wood), within and around the agricultural lands. The trees are grown sparsely and scattered within agricultural lands and in regular rows along the field borders. The woody tree species made use of are poplar (*Populus* sp.), willow (*Salix* sp.), olive trees (*Olea europaeae* L.), almond (*Prunus dulcis* Mill.) and so forth. The trees grown in such kind of lands, provide wood for fuel and building material, various shelled fruits, borders for fields and shade.

### Homegarden

Every household has a homegarden around their house. Fruit trees are observed throughout the village in homegardens. Important fruit tree species at homegardens are fig (*Ficus carica* L.), pome-

granate (*Punica granatum* L.), Turkish walnut (*Juglans regia* L.), white mulberry (*Morus alba* L.), Turkish prune tree (*Prunus myrobalana* Leisel), common pear (*Pyrus communis* L.) and apple (*Malus* sp. L.). Most of the households get homegarden products for their own consumption. A few households sell their products in the local market of Aglasun town. The activities of home gardening are done throughout the year.

### **Orchard**

A few of the villagers have very small sized orchards. All of the orchards are situated close to water resources. Major fruit trees found in orchards are the European plum (*Prunus domestica* L.), common pear (*Pyrus communis* L.) and apple (*Malus domestica* Borkh). Villagers sell their products directly to the market.

### **Village Woodland**

The village common woodland covers an area of 5 decares. This area was created by afforestation in 1978. The essential trees in this area are true cypress (*Cupressus sempervirens* L.) and brutian pine (*Pinus brutia* Ten.).

## **MODES OF USAGE OF TREES AND FOREST RESOURCES**

By means of this study, it is shown that trees have important roles in the daily life of the household and that local people have their own ways of managing the surrounding trees. The usage patterns of the trees and forest resources are given here.

### **Construction Materials**

The needs of construction materials for the inhabitants of Aşağı Yumrutaş are supplied by the forest chief of Aglasun Forest Directorate. This department provides subsidized (at prime costs) allotment of 12 m<sup>3</sup> timber to the head of the household for the once in a life time construction of a house for a 6 member household, up to 12 members, with 1 m<sup>3</sup> more for each member, provided that the head of the household is at a certain age, engaged or married and registered as continuously living in the village. After ten years a subsidized timber provision for repair purposes is possible (one quarter of the first allotment). Afterwards, every five years one added quarter of the initial allotment is possible. Once in a life time the allotment of 3 m<sup>3</sup> per household for construction and 2 m<sup>3</sup> for barn construction is provided. Therefore the household has to apply for a transport certificate, which is normally done by the headman of the village at the forest superintendent's office. The household has to bear the costs for the certificate and also organize and pay for the transportation on his own. The trees provided as construction material are brutian pine (*Pinus brutia* Ten.) and Anatolian black pine (*Pinus nigra* Arnold. subsp. *pallasiana* (Lamb.) Holmboe).

The construction material needs of the villagers were met with very low prices in 1980s. In recent years there have been amendments to Article 31 and 32 of the Turkish Forest Law. As a result of these amendments, the price of timber has increased. Due to this increase some of the villagers could not buy construction material. On the other hand, the amount of timber provided by the Forest Administration is usually not adequate. Therefore, some of the villagers obtain their timber needs from state forests in illegal ways (Güneş and Elvan, 2005). That is the reason why the amount of the construction material received from the Forest Administration is always very low.

### **Fuelwood**

In Aşağı Yumrutaş Village, the fuelwood is still an essential source in the provision of energy. All the households use fuelwood for heating. Most households use it twice a day for cooking in the mornings and evenings. As a result of the inquiries made with the villagers, it is apparent that while



30 years ago about 15 ton/per family/per year fuelwood was consumed for all their needs (cooking, house heating and water heating), recently this figure has decreased to only 10 ton/per family/per year. Once this amount is compared with the consumption of other rural areas, Asağı Yumrutas Village is considerably dependent on forest resources in terms of energy provision (Turker and Turker, 1997).

Firewood is delivered to the villagers by the Chief of Aglasun Forest District Directorate. A maximum of 6 tonnes of subsidized firewood allotment are also provided. In the 1980 s, fuelwood was given to the villagers at low prices. However, nowadays people have to get their fuelwood at almost the same price as the real market prices. For this reason, people in the village are searching for different fuelwood resources. According to the villagers, dead and fallen trees on farmlands are another source of fuelwood. Villagers stated that recently this source was very scarce, so some people; mostly the poor go to the forest to collect dead and fallen wood. The amount of wood used by each household varies according to the household size and their cooking patterns (Fig. 4).

The trees preferred for different kinds of heating and cooking are the Turkey oak (*Quercus cerris* L.), common oak (*Quercus robur* L.), kermes oak (*Quercus coccifera* L.), holm oak (*Quercus ilex* L.) and the brutian pine (*Pinus brutia* Ten.). On the other hand, the villagers produce resinous piece of wood for igniting fire. It is produced by brutian pine (*Pinus brutia* Ten.) and Anatolian black pine (*Pinus nigra* Arnold. subsp. *pallasiana* (Lamb.) Holmboe).

### Human Food

Although dependency on the forests for food is considered minor, the forests play an important role as a direct and indirect source of food for the villagers. Various parts of some trees are edible; for example leaves, fruits, flowers and roots. There are olive trees (*Olea europaeae* L.) growing naturally in the forests surrounding the village. It plays a very important role in the villagers' diet. The villagers collect the fruits of these olive trees and consume them as pickled olives. Moreover, they produce olive oil and use it in their meals. On the other hand, the fruits of some naturally grown tree species are collected by the villagers. Natural edible fruits are products of common medlar (*Mespilus germanica* L.), olive tree leaved pear (*Pyrus elaeagnifolia* Pall.), common pear (*Pyrus communis* L.), almond leaved pear (*Pyrus amygdaliformis* Vill.) and some other species. The villagers collect some naturally grown edible mushroom species in the forest areas. Rotunda (*Morchella conica* (Pers.) Boider, *Morchella conica* var. *deliciosa* (Fr.) Cetto) is of great importance among these species. Villagers pick these mushrooms in the course of March and May. Since it is an expensive species, villagers do not consume these mushrooms themselves and sell them to the customers coming to the village. Also there are many other plants growing in forest areas. The villagers collect these plants and make use of them as food. For example, the leaves of *Rumex obtusifolius* L. and *Urtica dioica* L. are used as vegetables. Most of the natural food gatherers are women and children. Because of the deterioration and overexploitation of forests and tree products, the villagers can no longer depend solely on forests and tree products for food. They try to grow vegetables, spices and fruit trees in their homegardens or in a portion of their fields to supply their daily needs for food (Fig. 5).

### Medicinal Plants

Asağı Yumrutas Village is away from the public health center. Common illnesses are cured with traditional medicine made in the village. Some of these are obtained from the plants growing in the forest ecosystem. For example, Common myrtle, known botanically as *Myrtus communis* L., is an evergreen plant belonging to the Eucalyptus genus. It is widely used medicinally by villagers. The leaves, berries and flowers of this lovely bush are all medicinal. Moreover, the sage plant (*Salvia officinalis* L.) and tyme (*Thymus serpyllum* L. and *Thymus vulgaris* L.) are generally used in the treatment of many illnesses (common cold, common influenza, stomachache, nausea) and they grow



Fig. 4: Fuelwood in a household



Fig. 5: Wild mushroom from natural forest resources

in the forest vegetation. In the past, medicinal plants were available near the village. Some could be collected from any field without asking the owner's permission. Plants in the forest might be uprooted, if their roots are needed for medicinal use. No individual or collective effort has been made to replant these medicinal species. This has resulted in the scarcity of species used as medicine. These medicinal products are usually sold to villagers who need them at a reasonable price. It has been noticed that demands for these kinds of traditional medicine are decreasing.

### **Agricultural Tools**

Turkey could convert to the agricultural mechanization that took place at the end of 1950 s. The common use of tractors in agricultural fields started in these years. However agricultural mechanization practices started very late in Asağı Yumrutas village and since there are slopely fields, the villager could not make use of this machinery. Due to inconvenience of transportation in the past, most rural communities had to be self-sufficient. Needed agricultural tools had to be produced by the households using materials available locally (Keyder, 1983). In Asağı Yumrutas, each household used to make its own agricultural tools such as the plough, harrow, yoke, wooden pitchfork and handles of spade and hoe. The wood used for these tools was taken from various valuable forest trees. The wood of the Turkish oak (*Quercus cerris* L.), white mulberry (*Morus alba* L.), oriental plane (*Platanus orientalis* L.) and flowering ash (*Fraxinus ornus* L.) were used for ploughs. Today, the agricultural fields with fewer slopes are ploughed by tractors. Nevertheless, some of the fields are still ploughed through the use of animals. At present, farmers use iron-made ploughs which are sold in the market due to their heavy duty, lighter weight and better efficiency. Fishing tools are hand-made by local people. Wood still remains an important part of such products like dip nets and fish traps. The tools produced are mainly for household use and not for market sale. Villagers who are interested in trapping birds also need wood supplies to build their bird traps. Particularly, they feed partridges that they trap in cages made of very thin branches.

### **Fodder**

Animal husbandry is widespread in the upper plains of the village. In particular, all areas where the vegetation consists of kermes oaks (*Quercus coccifera* L.) and holm oaks (*Quercus ilex* L.) are feeding grounds for the woolly goats. Products from trees can also serve other purposes when grass becomes scarce; livestock are usually left grazing in the fields and fed directly on tree foliage within their reach. The species that are edible for livestock are the Turkey oak (*Quercus cerris* L.), the common oak (*Quercus robur* L.) and the white mulberry (*Morus alba* L.).

### **Other Uses**

The plantation of trees, shrubs, bushes along roads and their inclines, sloped terrains and platform borders, prevent landslides and soil erosion. For this purpose, woody species, like locust acacia (*Robinia pseudoacacia* L.), Cyprian acacia (*Acacia cyanophylla* Lindl.) and deep-rooted bushes, offer multiple uses as well as fruit trees. Trees in farmlands also contribute to plant nutrition to the topsoil, either directly or indirectly. Fallen leaves help to fertilize the soil. Some farmers have reported that their cattle as well as others are purposively fastened under a specific tree in the field, so that the animal manure adds nutrients to the soil. Various tree species that serve as screens within appropriate areas in agricultural lands or along the field sides, are planted to prevent wind-related damage. Woody species used for this purpose are wind-resistant with good establishment ability to grow in height and branches. Agricultural plants are adequate for the use of the villagers. In the flat plateau terrains of the country, black poplar (*Populus nigra* L. var. *pyramidalis* Spach.) and along the edges of agricultural terrains in the coastal areas of the village, oleaster (*Elaeagnus angustifolia* var. *orientalis* L.) and true cypress (*Cupressus sempervirens* L.) are widely planted.

## **IMPACT OF FOREST USE ON FOREST RESOURCES**

Forest usage activities of Aşağı Yumrutaş inhabitants have generated negative impacts on the socioeconomic status of villagers. Similarly, they bring about the same outcomes to the ecosystem.

### **Effects on Socioeconomic Conditions**

In general, the livelihood of the villagers is greatly enhanced by utilizing the forests. In the past, they had moved from a very hard nomadic life to this settlement area. Although conditions may still be hard in the new environment, they have finally discovered that the three basic necessities for human survival (construction material, fuelwood, food, etc.) have become easier to obtain. Without the forest, their past livelihood would not have been better than their new one.

### **Effects on Settlement Area**

Obviously, the forests have played a major role in providing construction materials for housing, barns, haylofts and materials for farming tools, furniture etc. to the villagers. They obtain their wood needs from the forests, either by taking the construction material and fuelwood from Forest Services or by cutting the trees themselves in illegal ways.

### **Effects on Food Security**

Although dependency on forests for food is considered minor, the forests play an important role as a direct or indirect source of food for the villagers. The villagers seasonally collect mushrooms, edible ferns, fruits, roots and hunt for meat (animals and birds) from the forest. Normally, the gatherer consumes these foods himself. However, sometimes a portion of it is shared with the neighbors. Also the neighbors share their food (but not an obligation) when they have a chance to collect foods from the forest. Sometimes the villagers buy or sell the foods that they collected among themselves. The selling and buying process does not necessarily involve cash; it may be in the form of exchanging two different items for one another. On the other hand, the villagers sell the products obtained from animals and plants in the forest, in Aglasun market. In particular, edible mushroom species constitute a considerable amount of income.

### **Effects on Law Enforcement**

It is illegal to make use of state forests without permission in Turkey. There are some regulations for this issue in 6831 numbered Forest Law. The villagers cut trees for their needs and feed their animals in the forest without taking these bans into consideration and therefore they harm the ecosystem of the forest. It is reported that the Forestry Department of Aglasun arrested more than 10 villagers for cutting trees illegally in the National Forest Reserve. The persons who committed crimes in this context have been punished with a fine or imprisonment.

### **Effects on the Ecosystem**

The uncontrolled forest usage by the villagers has led to serious deforestation, creating an imbalance in the natural environment. The deforestation process has had alarming impacts on the vegetation, wildlife, water and soil in the area.

### **Effects on Vegetation**

It is noticeable that deforestation has resulted in regeneration of pioneer species. In the degraded forests, the emergence of pioneer trees, shrubs, grasses and climbers are discernible. Forest yields are decreasing in the forests. In this respect, workmanship in the forestry is not enough for villagers. Before settlement, the village area was covered with a forest. After settlement, the villagers cleared

most of forest leaving only a few scattered trees. A few trees can also be seen in the agricultural areas. After the forest species are cut down, fruit trees are planted in place of them. The undulating area has little vegetation cover and current land-use practices cause soil erosion, which is increasing progressively.

#### **Effects on Wildlife**

Due to deforestation and illegal hunting, the wildlife has been adversely affected. It is commonly understood that the establishment of openings in the climax forest, either through natural or controlled means, will create natural habitats for wild animals and birds (Kaya and Raynal, 2001). In Aşağı Yumrutas village, hunting of wild animals and birds has been excessive, along with the activities of illegal tree cutting. Therefore, although habitats are being created, it is not easy to find wild animals. It is reported that in the past, big animals (mammals and reptiles etc.) like domestic goats, deer, wild oxes and rabbits were easier to find. Birds, like the wild partridge are said to have been plentiful. Nowadays only small animals and birds are present. It is reported that hunting has become increasingly unfruitful compared with fifty years ago. Some people have given up hunting completely because of unsuccessful efforts. When a hunting mission is attempted however, the hunter has to go very deep into the forest. Even then, the possibility of a successful mission is very low. The wild life population in the area will continue to decline if humans continue hunting. The only hope is a total prohibition of hunting in the area.

#### **Effects on Water Supply**

Water resources in the village are not sufficient, especially for agricultural irrigation. Moreover, some of the fountains providing drinking water for the villagers run low during the summer season. In Aşağı Yumrutas village the changing effects of deforestation have deteriorated the quantity as well as the quality of running water in the area. There used to be two small streams and one spring providing more sources of water for the villagers. However, continuous human activities have removed the vegetation along the streams. Vegetative regeneration has been impeded because of the same reasons. These activities have adversely affected the natural flow of the stream waters. The streams are now often dry and not useful for the villagers except during the winter season. The water shortage has made crops fail on many occasions, especially vegetables. Most of the farmers are now discouraged from growing vegetables. They have been buying these food items and other vegetables from other farmers from other villagers, in the market. Another helpful measure is to set up ponds and open new wells at appropriate localities to collect rain water as well as running water.

#### **Effects on Soil Fertility and Soil Erosion**

Interviewees reported that crop production per unit of land is decreasing gradually due to erosion of top soil. Ploughing the lands up and down by a tractor accelerates soil erosion, which decreases soil fertility. If these are not controlled, farmers are expected to incur higher farming costs in the future. There is necessity to teach farmers relevant and more productive farming technologies; indigenous or semi-modern.

#### **Shortage of Agricultural Lands**

Aşağı Yumrutas village is surrounded by state forests. The village can not expand towards the forests. Under these circumstances, more agricultural lands can not be created. Therefore, the agricultural lands in the village are limited. In this respect, an increasing population is likely to face harder living conditions.

## **CONCLUSION**

The villagers living in forest areas and the forest resources of Turkey have a multi dimensional relationship. The forest resources which have limited areas, assets, growth and other peculiarities have the same problems with the forest villagers who are on the lowest level in the community in terms of resource use. Limited forest resources in forest villages, which cannot meet the needs of people, cause an imbalance between needs and resources. Because of this, forest villagers who cannot live under appropriate living conditions cut forest trees illegally, open the forest for agricultural cultivation and graze their animals in the forest sources. The fields opened by the villagers cannot provide adequate production; so agricultural activities are terminated because of the unsuitability of these lands.

The utilization of the land, there is careless use of trees and forests. This case study illustrates how the villagers use and manage the trees on their land and in their surroundings. In spite of the fact that we in a new millennium, forest villagers are considerably dependent on the forest resources surrounding them. Because of this dependency, forest resources cannot be operated. Due to the social pressure on forest resources, desired results cannot be acquired from forestry activities because both the forest administration and the rural population have various expectations and usage desires. When two sides insist on their expectations and desires, a rational result cannot be obtained in the usage of the resources. For this reason, it is necessary to do forestry practices which will be for the benefit of both sides. Hence, in Turkey forestry practices which aim to meet the major demands of the rural population regarding forest resources, should be implemented.

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