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NON-WOOD FOREST PRODUCTS AS A COMPONENT OF THE TOTAL ECONOMIC VALUE OF TURKISH FORESTS

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Abstract

Forests like other natural resources perform a set of functions to meet the needs of people. It is usually impossible to state the monetary value of all goods and services provided by forest resources in most countries. These goods and services are generally called as non-market goods and services. Therefore, the valuation of non-market goods and services as a research area is getting importance rapidly in Turkey as well as in other countries.

The sum of all values, which a natural resource has, is accepted as Total Economic Value (TEV). There is no definite and rigid rule about the components of TEV and therefore, many different approaches have been discussed about this concept. In another word, the items forming the TEV are classified into main and sub-components such as positive and negative externalities or use, non-use, option, existence and bequest values. The contribution of direct and indirect use values, option values, existence values and negative externalities to the TEV are accounted for as far as possible.

In Turkish forestry, the most important part of TEV is represented by the direct use values including wood and non-wood forest products. The option and existence values remain someway vague and difficult to be calculated. Therefore, the share of forestry sector which is among the main production sectors in the national economy and accounts for only 0.3%; this rate arises mainly from wood forest products, partly from non-wood forest products and very little from hunting and recreation.

In this study, the TEV concept will be reviewed briefly for Turkish forestry, and then the non-wood forest products as its TEV components will be given and then the share of NWFPs in the TEV of Turkish forests will be determined by using the data of MEDFOREX Project and lastly Turkish forest resources will be discussed as far as possible from the social-economic and environmental points of views regarding the sustainable forestry and also possibilities of increasing the share of non-wood forest products in the TEV of Turkish forest resources.

Keywords: Non-wood forest products, total economic value, Turkish Forestry sector

1. Introduction

When such renewable and multi-functional natural resources as forest resources are sustainably used, they have always positive effect on development activities. There is close relationship between sustainable development and sustainable forestry, because the sustainable forestry involves management and maintaining of health and vitality forest ecosystem not only for today's generation but also for future generation.

Forests provide various products and services that are used by people. Timber and other timber-based products such as lumber, panels, pulp, fuelwood etc. are of course important products. However, there are other group of products many people use to meet their health and nutritional needs. These products are non-wood forest products (NWFP). NWFPs are of great importance for millions of households worldwide especially in developing countries. They are used especially by local people for subsistence, consumption and income.

Various terms (e.g., nontraditional, secondary, minor, nonwood, and special or specialty) have been used to describe forest products that are not timber-based. Non-wood forest products include all goods of biological origin, as well as services, derived from forest or any land under similar use, and exclude wood in all its forms (Chandrasekharan 1992).

In many cases, these products are neither minor nor secondary, and they often are not specialty products but move through distribution channels as commodities. Many of these products have a long tradition in society; hunters and gatherers were collecting products from the forest long before they had the technology to cut timber (Chamberlain et al. 2002).

NWFPs at least have the following in common: they interact with a different, and larger, set of stakeholders than does timber; they often embody cultural values, through representing 'traditional' uses; they have shorter production cycles, and their yields and ecological roles are less well known than those of the main timber species (Lawrence 2003).

This study aims to assess the status of NWFPs as a TEV component, in the total TEV indicating the total of values including the marketable and non-marketable goods and services of Turkish forest resources. The paper firstly gives conceptual information related to the TEV approach and its components. It then evaluates the estimates of TEV results for Turkish forest resources, especially the value of the NWFPs.

2. Total Economic Value Approach

The increasing and diversifying demands for forest products and services caused forestry sector and foresters to find more place in public agenda both at global and local levels. Therefore, the development of various approaches has been needed in order to identify the economic values of forests and its relative importance among other natural resources. The TEV approach has been proposed as a result of these kinds of lookouts.

2.1. Total Economic Value Concept

In economics, a good or service is valuable if it increases human well-being. This implies that goods or services have no value in their own right. Rather, their value is defined only in the context of human welfare (Krieger, 2001).

Consequently, the economic concept of value has been broadly defined as any net change in the welfare of society. This concept does not restrict environmental values to benefits from the direct use of a resource. For example, the benefits received from environmental resources such as enjoyment of national parks and clean air add to an individual's well-being, as do the benefits obtained from the consumption of goods such as steel and sawn timber (Anonymous 1996).

Economic value concept includes not only increasing the welfare level of individual by the benefits as a result of the direct use, but also values provided from goods and services used by individual in any way even if they are not subject to the his or her direct use. The TEV concept has been recently used to identify and, to a certain extent, quantify, the full value of the different components of natural resources, such as forests (Croitoru, 2004). After all these explanations, TEV can be defined as total

of all values provided by a natural resource. These values will be evaluated in the subsequent section, and generally include use value and non-use values.

2.2. Total Economic Value Components

The main and sub-components of TEV concept can variously be classified. There are no rigid and certain rules related to the components of the TEV. The classification widely used in the valuation of environmental resources including forests is given in Figure 1 (Pearce and Moran, 1994; Croitoru, 2004). As in the Figure 1, the main and sub-components of TEV include use and non-use values, direct and indirect use, option, bequest and existence values.

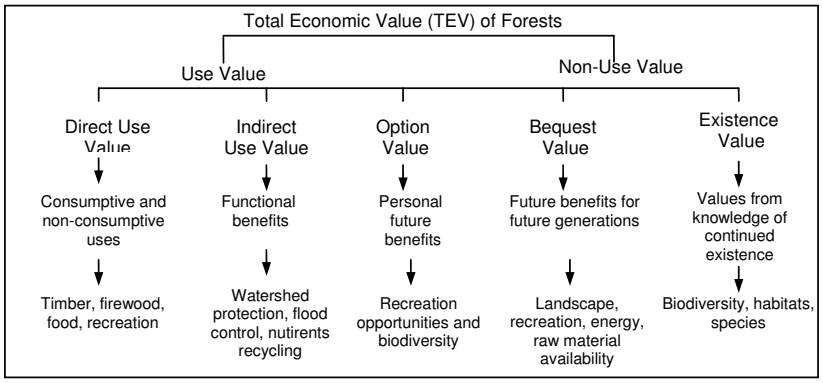

Figure 1. Total Economic Value of Forests

A use value is much as it sounds — a value arising from an actual use made of a given resource. This might be the use of a forest for timber, or of a wetland for recreation or fishing, and so on. Use values are further divided into direct use values, which refer to actual uses such as fishing, timber extraction etc; indirect use values, which refer to the benefits deriving from ecosystem functions such as a forest's function in protecting the watershed; and option values, which is a value approximating an individual's willingness to pay to safeguard an asset for the option of using it at a future date. This is like an insurance value (Pearce and Moran, 1994).

Non-use values are slightly more problematic in definition and estimation, but are usually divided between a bequest value and an existence or “passive” use value. The former measures the benefit accruing to any individual from the knowledge that others might benefit from a resource in future. The latter are unrelated to current use or option values, deriving simply from the existence of any particular asset. An individual's concern to protect, say, the blue whale although he or she has never seen one and is never likely to, could be an example of existence value (Pearce and Moran, 1994).

Besides this general and common usage, the theoretical framework of the TEV can be related to a pragmatic view of market, potential market and non-market values of forests, depending on whether forest outputs are sold, can be sold, or cannot be sold on real markets. The TEV framework can also adapted to encompass private and public goods and externalities with various gradations, including club and local goods (Croitoru et al., 2000).

3. Material and Method

This study focuses on estimation of TEV for Turkish forest resources and especially examination of the NWFPs. The main findings of this study are based on a project, *MEDiterranean FORest public goods and EXternalities (MEDFOREX)* and cover 18 Mediterranean countries including Turkey. Turkish section of this project is also performed by authors. This project is about the estimation of TEV for the forests of Mediterranean countries in context of an international project.

In the coverage of the project, the TEV approach was used for the estimation of TEV for the Turkish forests. This means that positive and negative forest outputs were considered in the estimation process of TEV for Turkish forests. In this case, seven different direct use values (wood based forest products, illegal fuelwood consumption, non-wood forest products, grazing, hunting, fishing and recreation), one indirect use value (carbon storage) and; option, bequest and existence values (pharmaceuticals and protection of biodiversity), and two types of negative externality as negative outputs (erosion, avalanche and forest fires) were estimated at the minimum level for Turkey.

4. Valuing the Total Economic Value of Turkish Forest Resources

The annual production values of Turkish forest resources were summarized in Table 1 by the TEV components. According to Table 1, two main components as positive and negative outputs were used in the determination of the TEV for the Turkish forests. While the positive components are increasing the TEV, other components are cutting the TEV due to their negative indication.

Table 1. Forest Values according to TEV Components (Türker et al., 2005)

Valuation method/Output	Quantity	Value (000 US$)	Value (000 €) 2001 prices[e]
Direct use values			
Market price valuation:			
Timber for sale[a] (m^3)	10,316,000	435,030	421,979
Firewood for sale[a] (m^3)	13,620,000	14,785	14,341
Firewood illegally harvested [b] (m^3)	10,000,000	40,000	38,800
Resin[a] (t)	391	1,898	1,841
Mushrooms[a] (t)	11.4	11,482	11,138
Medicinal and aromatic plants[a] (t)	...	8,642	8,383
Truffles[a] (t)	395	0.5	0.5
Styrax (Liquidambar oil) [a] (t)	5.9	56	54
Sticks and twigs[a] (t)	3711	22	21
Bay leaves[a] (t)	4221	9,253	8,975
Carob (fruit) [a] (t)	12	6	6
Chestnuts[a] (t)	262	262	254
Pine kernels[a] (t)	541	7,172	6,957
Snow drop, cyclamen and other bulbous plants[a] (t)	180	1,087	1,054
Thyme, oregano[a] (*Thymus, oreganium*)	6038	13,237	12,840
Others[a] (t)	...	32,927	31,939
Substitute goods:			
Grazing[b] (t)	2,300,000	225,000	218,250
Permit price, licences, fees:			
Hunting[b] (no. hunters)	350,000	15,800	15,326
Angling[b]	...	20,148	19,544
Recreation[b] (day-visits)	93,400	2,000	1,940
Total direct use values		**838,807**	**813,643**
Indirect use values			
Shadow pricing:			
Carbon sequestration[c] (tC)	7,920,000	158,400	153,648
Total indirect use values		**158,400**	**153,648**
Option, bequest and existence values			

Production function approach:			
Pharmaceuticals[b] (no. of plant species)	9,000	112,500	109,125
Cost-based method:			
Biodiversity conservation	...	1,380	1,339
Total option, bequest and existence values		**113,880**	**110,464**
Negative externalities			
Cost-based method:			
Erosion, floods and landslides[b] (t of nutrients)	110,000	- 125,000	-121,250
Losses due to forest fires[d] (ha)	5,800	- 8,607	-8,349
Total negative externalities		**-133,607**	**-129,599**
TEV		**977,480**	**948,156**

In figure 2, the ratio of each component in the TEV of forests was presented according to their sizes considering the percentage rates in the last column of Table 1.

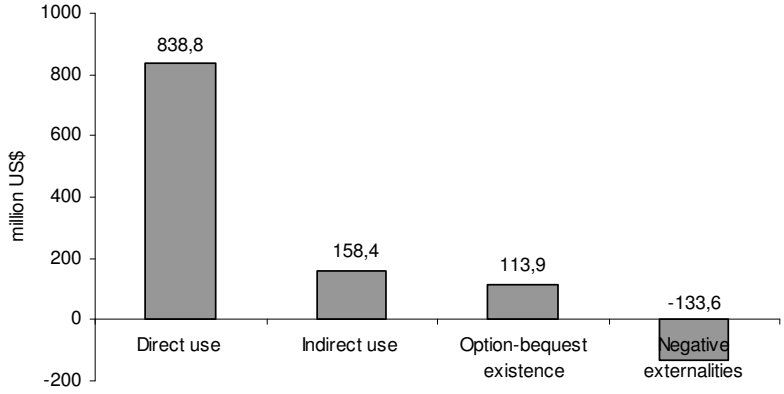

Figure 2. Distribution of TEV Components related to the Turkish Forests (Türker et al., 2005)

Erosion, floods and landslide are one item of the negative externalities, rank fourth in the components forming the TEV. Although forest fires rank third from end in the TEV components according to the amount of value, as mentioned above, they decrease the positive components of TEV at the 12 % rate along with the erosion, floods and landslide. In the last column of Table 2, two negative externalities together amount as much as 13.7 % of TEV estimated for the Turkish forests.

At this point, the TEV of Turkish forests can vary according to the availability and usability of data related to the positive or negative TEV components. However, at the result of estimations made under limitations and conditions of the study, the TEV of Turkish forests are estimated as US$ 977,480,000. When negative externalities is removed or avoided by some precautionary measures, estimated TEV of Turkish forests would be at least US$ 133,607,000 higher. Thus, TEV of the Turkish forests would increase up to positive TEV outputs as US$ 1,111,087,000.

5. Valuing Non-Wood Forest Products

Direct use values are mainly represented by WFPs and a wide variety of NWFPs, such as resin, styrax, mushrooms, pine nuts, bay leaves and many types of medicinal and aromatic herbs. Other important NWFPs include animal fodder, in the form of leaves, grass and other vegetation, particularly

from those areas designated as rangelands. Water from forested catchment areas, the benefits of urban greenbelts and recreational amenities should also be included under this heading (Muthoo, 2001).

Several NWFPs, such as resin, mushrooms, medicinal and aromatic plants, truffles, are valued according to the quantities traded on the market and their average price (Table 2).

Table 2. Value of Non-Wood Forest Products (adopted from (Türker et al., 2005)

Output	Quantity	Value (000 US$)	Value (000 €) 2001 prices[e]
Resin[a] (t)	391	1,898	1,841
Mushrooms[a] (t)	11.4	11,482	11,138
Medicinal and aromatic plants[a] (t)	…	8,642	8,383
Truffles[a] (t)	395	0.5	0.5
Styrax (Liquidambar oil) [a] (t)	5.9	56	54
Sticks and twigs[a] (t)	3711	22	21
Bay leaves[a] (t)	4221	9,253	8,975
Carob (fruit) [a] (t)	12	6	6
Chestnuts[a] (t)	262	262	254
Pine kernels[a] (t)	541	7,172	6,957
Snow drop, cyclamen and other bulbous plants[a] (t)	180	1,087	1,054
Thyme, oregano[a] (*Thymus, oreganium*)	6038	13,237	12,840
Others[a] (t)	…	32,927	31,939
Total	….	**86,044**	**83,462**
Share of NWFPs in the Direct Use Value (%)		**10,26**	
Share of NWFPs in the TEV of Turkish Forests (%)		**8,8**	

According to Table 2, the share of NWFPs in the direct use value of Turkish forest resources, which is a component of TEV, is about 10,26% and in the TEV of Turkish forests is 8,8%

6. Results and Discussion

This study explored the estimation of a large framework of TEV elements for Turkish forests. TEV of positive outputs is estimated about US$ 1,111,087,000 while the TEV of negative outputs is US$ -133,607,000. Thus, negative externalities cause TEV of positive outputs to diminish about 12%. So, general TEV is US$ 977,480,000. These figures should be perceived as threshold values, because the minimum values is used for the inputs of TEV estimation due to complexity and difficulties in the estimation of values for non-marketed forest products and services. That is to say real TEV values of Turkish forests are much higher than we estimated with this study.

We experienced such difficulties and limitations as lack of sound and comprehensive statistics and data often encountered in such kind of studies. There have been no formal estimates about the overall value of the NWFPs in Turkish forestry. However, results of the MEDFOREX, which is pioneering study in its field and mainly referred in this paper, explicitly illustrate the economic importance of these products. Thus NWFPs should not be regarded as minor or secondary products.

Although there is an underestimation of NWFPs in Turkish forestry, they have a very important weight in direct use value of Turkish forests. However this 8,8% weight in TEV of Turkish forests is much more below the real NWFPs potential of Turkish forests. There is a certain need to broaden the understanding of NWFPs in the management of Turkish forests.

These products deserve a prominent place in management of Turkish forest. Most forested region in Turkey offers plentiful opportunities for the production of NWFPs.

Only are a few of NWFPs produced according to the annual production programs by forestry agencies such as resin, sytrax, and bay. Some others are produced by forest villagers' cooperatives. There is a certain amount of illicit use of NWFPs, which is a great threat for many specimens, even those produced by forestry sector and cooperatives. These illicit usages are important in relation to the financial vitality of the forestry sector. The ways to cutting down this illicit use of NWFPs should be searched through participatory processes.

Even though Turkish forests are unique opportunities in terms of NWFPS, most of the NWFPs are subject to export as raw material. And limited amount of incomes from NWFPs turns back to the forestry sector. According to a report annual export of medicinal plants is about 30 000 ton and value of this products is about $ 50 000 000. This causes Turkey hold a third position worldwide medicinal plant trade following the India and China (Özhatay vd., 1997). When we look at the contribution of NWFPs in TEV, it is easy to figure out that forestry sector deserve much more return.

These figures also indicate that there is a great inequity of sharing of returns. This sharing is not in favor of local people who are the mostly collecting the NWFPs. These local people are generally living in very difficult conditions. Their income level is far below the average of Turkey. Turkish forestry sector could take the advantages of NWFPs by focusing on exporting of final product instead of raw material to the different sectors in foreign countries. This might also help development of forest villagers and eliminating the inequities of sharing returns from NWFPs. When wisely planned, managed, produced, and marketed, NWFPs are great opportunity for sustainable forest management. They would contribute to the social, financial and ecological aspects of sustainability.

Valuation of non-marketed goods and services challenges researchers dealing with TEV estimation. This kind of challenges is intensively faced in determination of importance and share of forestry sector in Turkish economy. Only are wood products and some non-wood products regarded to determine sectoral financial accounts, this accordingly make the share of forestry sector in national economy (0,5%) seems smaller even unimportant. It thus leads to forestry sector deprive from needed financial supports to fulfill its investments (Türker, 1999).

The establishment of the sustainable forestry would be possible as the forestry sector takes financial source it deserved and gets economical viability. This, of course, requires cutting down negative externalities and allocation of much financial resource from national budget to forestry sector in Turkey. When the policy makers transfer the required financial share to forestry sector, forestry sector thus would be enable to make its investments sustainable, relieving the rural poverty, reducing timber supply deficit.

Certification is another issue regarding the NWFPs in Turkish forestry. Certification is a market-based instrument for promoting the sustainable forest management. Certification initiatives for NWFPs developed later than those for timber certification programs. However,

because of their relative lower environmental impact and higher social benefits, certification initiatives of NWFPs are developing quite rapidly (Viana et al. 1996). Because nearly all of the forestry export is NWFP, it might be more important for Turkish forestry to involve with forest certification for NWFPs before the timber products.

References

Anonymous, 1996. A Handbook of Environmental Evaluation. Department of the Environment, Sport and Territories: http://www.erin.gov.au/portfolio/esd/handbook Access Date: 15.05.2001

Chamberlain, J.L., Bush, R.J., Hammett, A.L. and Araman, P.A., 2002. Managing for Nontimber Products, Journal of Forestry, January/February 2002.

Chandrasekharan, C. 1992. Terminology, Definition and Classification of Forest Products Other Than Wood. www.fao.org/docrep/V7540e/V7540e28.htm Accessed September 30, 2006.

Croitoru, L., 2004. Valuing forest public goods and externalities and application to Mediterranean forest, II Latin American Symposium on Forest Management and Economics, 18-20 September 2004, Barcelona, Spain.

Croitoru, L., Gatto, P. and Merlo, M., 2000. Non-wood forest products (NWFP) as a component of the Total Economic Value (TEV) of Mediterranean forests – First results of an ongoing research. In: Joint FAO/ECE/ILO Committee on Forest Technology, Management and Training, Seminar Proceedings *Harvesting of non-wood forest products,* 2-8 October 2000, Menemen-Izmir, Turkey,

Krieger, D.J., 2001. The Economic Value of Forest Ecosystem Services:Areview, The Wildernes Society, Washington D.C.

Lawrence, A., No forest without timber?, International Forestry Review 5(2), 2003.

Muthoo M.K. 2001. Forests and Forestry in Turkey, Ministry of Forestry, Second Edition, Ankara.

Özhatay, N., Koyuncu, M., Atay, S. ve Byfıeld, A., 1997. Türkiye'nin Doğal Tıbbi Bitkilerinin Ticareti Hakkında Bir Çalışma, DHKD, ISBN 975-96081-9-7, İstanbul

Pearce, D and Moran, D., 1994. *The economic value of biodiversity*, London. Earthscan.

Türker, M. F., Pak, M. and Öztürk, A. (2005) Chapter 13. Turkey. In: Merlo, M. and Croitoru, L. (eds.) Valuing Mediterranean forests: Towards Total Economic Value, CABI Publishing.

Türker, M.F., 1999. The determination of the importance of the forestry sector in national economy using input–output analysis, *Turkish Journal of Agriculture and Forestry* 23, Supplement 1, 229–237

Viana M., Pierce, A., Donovan, R., 1996. Certification of non-timber forest products, in Viana, V., Ervin, J., Donovan, R., Elliott, C., and Gholz., H., (eds). Certification of forest products: Issues and perspectives. Island Press, Washington, D.C