

**ENSURING SUSTAINABILITY OF FORESTS AND
LIVELIHOODS THROUGH IMPROVED
GOVERNANCE AND CONTROL OF ILLEGAL
LOGGING FOR ECONOMIES IN TRANSITION**

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for
The World Bank**

**Savcor Indufor Oy
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ABBREVIATIONS AND ACRONYMS

%	percent
AAA	Armenian Agricultural Academy
AMD	Armenia dram (national currency)
BMA	Bio-resources Management Agency
CIS	Commonwealth of Independent States
cm	centimeter
CSJSC	Closed State Joint Stock Company
EUR	Euro
FAO	Food and Agriculture Organization of the United Nations
FE	Forest enterprise
FISP	Forest Institutional Support Project
FMP	Forest Management Planning
FREC	Forest Research and Experimental Centre
GDP	Gross Domestic Product
GEF	Global Environmental Facility
ha	hectare
HQ	headquarters
IDA	International Development Agency
IMT	Inter-Ministerial Taskforce on Illegal Logging
km	kilometer
m	meter
m ³	cubic meter
MoA	Ministry of Agriculture
MoNP	Ministry of Nature Protection
NFP	National Forest Program
NGO	Non-governmental organization
NRMPRP	National Resource Management and Poverty Reduction Project
NWFP	Non-wood forest product
PRSC	Poverty Reduction Support Credit
RA	Republic of Armenia
RFDF	Reforestation and Forest Development Fund
SIDA	Swedish International Development Cooperation Agency
SLU	Swedish University of Agricultural Sciences
TOR	Terms of reference
USD	United States Dollar
USSR	Union of Soviet Socialist Republics
VAT	Value Added Tax
WB	The World Bank
YBC	Yerevan Brandy Company

1. INTRODUCTION

1.1 Basic Facts of the Forest Sector

1.1.1 **Current Status and Recent Trends with Respect to Forest Area of Total Land Area**

Today the forest cover in Armenia is less than one third of the estimated coverage 4 000-6 000 years ago. Given the current economic, social and political conditions in the country this decline is likely to continue and it will probably even accelerate. This poses a serious threat to the long-term sustainability of the country's development.

The best possible estimates indicate that as much as 35% of the country's territory was covered with forests 4 000 to 6 000 years ago (Moreno-Sanchez & Sayadyan 2005). By the XVIII century this coverage had been reduced to 18%, and by the early 1990s, according to the last reliable forest inventory to 11.2% (Khurshudyan 1999) (see Figure 1.1). The most recent estimates put the total forest cover at around 7% to 8% of the total area of the country or approximately at 245 000 hectares (Moreno-Sanchez & Sayadyan 2005). According to Statistical Yearbook of Armenia 2004 forest cover in Armenia accounts for 12.7% of total area.

The northeastern and southeastern parts of the country, as well as the eastern bank of lake Sevan have the most favorable climatic and environmental conditions for forest growth. Today 62% of the forest cover is found in the northeast, 36% in the southeast, and only 2% in the central region of the country.

In 1991 about 70% of the forest area was reported to consist of "high forest", where indigenous beech (*Fagus orientalis*), oak (*Quercus iberica*, *Q. macranthera*) and hornbeam (*Carpinus caucasia*) were the dominating tree species. The remainder was divided between "coppice forest" (22%) and "shrub forest" (7%). In 1992 the growing stock was around 40 million m³. Some 9 million m³ of these are located on steep slopes at high elevations without road access.

The state forest estate of Armenian forests (status in 1993) is described in Figure 1.2. The forest fund comprises 459 900 ha, of which 392 000 ha are forest soils and the rest non-forest soils. Of forest soil, 334 100 ha have forest cover.

The republic of Armenia is a country with low forest cover. Forest and forest covered territories per head of population constitute 0.15 and 0.1 ha respectively. For comparison, the forested area per CIS inhabitant is 2.7 ha, and the world mean 0.5-0.8 ha.

Total growing stock in 1993 was 41.74 million m³. The volumes of main tree species are:

- Beech – 20.68 million m³
- Oak - 12.5 million m³
- Hornbeam – 6.0 million m³
- Other tree species– 2.56 million m³

Figure 1.1 Extent of Forest Cover in Armenia in 1993

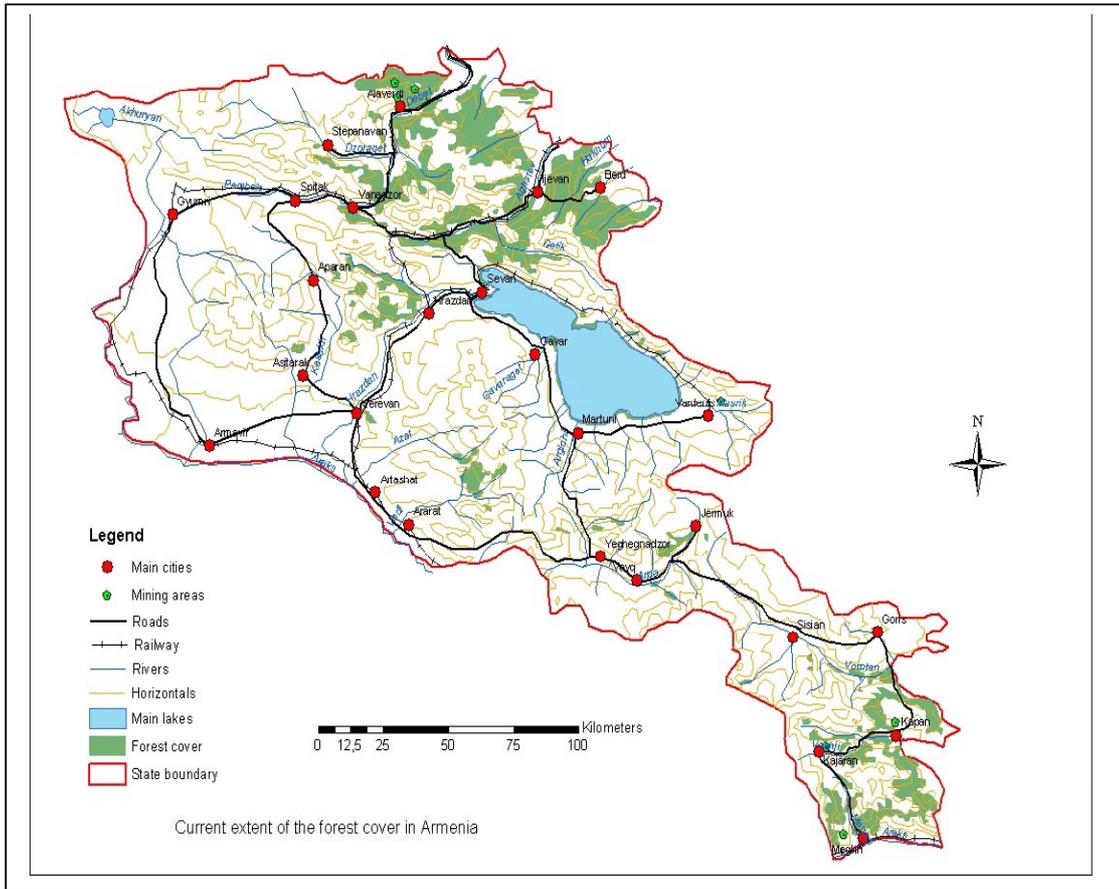
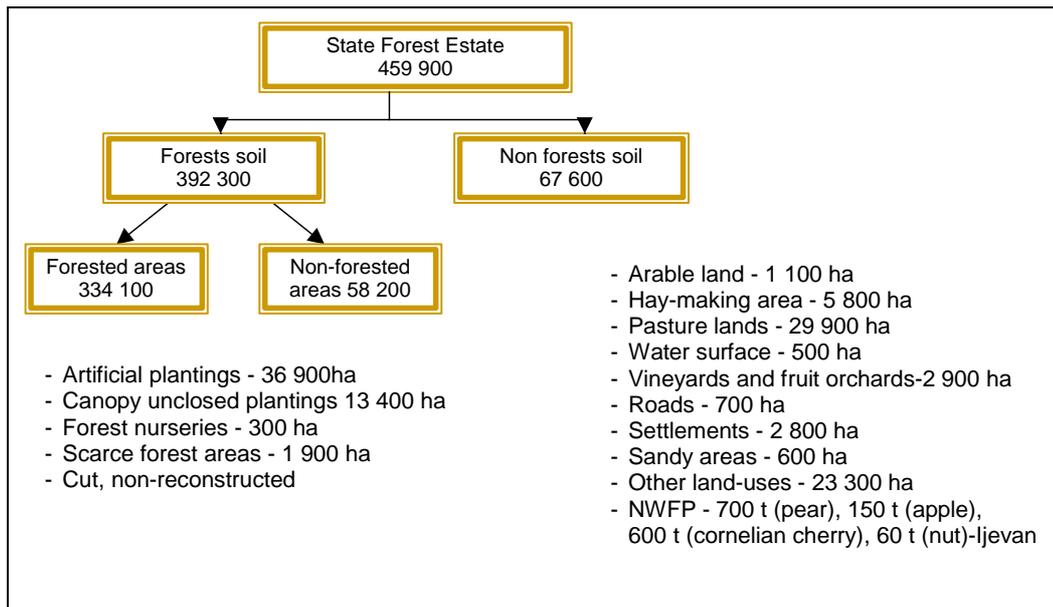


Figure 1.2 State Forest Estate of Republic of Armenia



Forests in Armenia are distinguished by their rich species' structure. There are 260 tree and shrub species growing in Armenia: five oak species (*Quercus*), two ash species (*Fraxinus*), two linden species (*Tilia*), two hornbeam species (*Carpinus*), elm (*Ulmus*), pear species (*Pyrus*), sorbus species, five juniper species (*Juniperus*), etc. Also, such relict tree species as yew (*Taxus Bacata*), hazelnut (*Corylus colurna*), walnut (*Juglans regia*) grow here. The main forest forming tree species are oak (*Q. macranthera*, *Quercus araxina*, *Q. iberica*), Eastern beach (*Fagus orientalis*), Caucasian hornbeam (*Carpinus Caucasica*), and in the low zone - Oriental hornbeam (*Carpinus orientalis*), which form not only pure stands, but also mixed and complex oak or beach stands.

1.1.2 Mountain Karabagh Forest Resources

Mountain Karabagh is situated in the south-eastern part of Caucasus and occupies about 4 400 km². It lies some 330 km from Yerevan, the capital of Armenia. Mountain Karabagh is mainly mountainous with a 1 100-m mean elevation and a temperate climate.

Compared with Armenia, the land area of Mountain Karabagh has a high proportion of forests. More than 36% or 160 000 ha of the land area is reported to be forests (Thuresson 2003).

The forest cover was extensively destroyed since 1988 due to the war between Mountain Karabagh and Azerbaijan. Mountain Karabagh was in economic and transportation blockade and the forest was overused, mainly to secure energy supply. Between 1988-1993 cutting in the forest was largely uncontrolled due to the war. However, after the ceasefire in 1993 it has somehow been controlled by the Mountain Karabagh Forest State Organization, although similarly to Armenia, illegal cutting is a major problem.

Mountain Karabagh is famous for its old and big oak stands, found especially close to high mountainous areas. Due to long transportation distance these stands have up until recently been protected. However, both the Yerevan Brandy Company (YBC) and other sources say that today parts of the oak logs bought by YBC probably come from Mountain Karabagh (Thuresson 2003).

Most available information suggests that forests in Mountain Karabagh are overexploited and there are concerns that the present situation will lead to considerable deforestation and forest degradation.

1.1.3 Forest Ownership

Article 3 of Armenian forest code from 1994 states: "The forests of the Republic of Armenia are its national heritage and the Republic's state property which can only be rented." This means that Armenian government is the only forest owner in the country. However, it is foreseen that private forestry will be developed in the near future on recently privatized lands.

Article 4 of the Armenian new forest code (2005) states: "State forests and forest soils are absolute property of Republic of Armenia and could not be privatized, except in cases

described in the article 58 of new forest code, i.e. when forests and forest soils are allocated for free utilization for the purpose of afforestation and reforestation”.

According to the second part of article 58 state and community lands could be allocated for free utilization through privatization if land users afforest or reforest non-forest lands and areas with unfavorable growing conditions using their own means, and transfer those lands into forest estate.

After Independence in 1991 about 330 000 farms were privatized. Some of them will probably plant fruit trees such as walnut and forest tree species. There is a great potential for forestry development in rural areas, particularly in the lowlands and along irrigation canals.

1.1.4 Rights of Use

Forest areas could be given to the forest users on short-term (up to five years) and long-term (from five to ten years) conditions. Forest users in the Republic of Armenia can be organizations or associations which have juridical status of the Republic of Armenia. The following forest utilization activities can be carried out according article 17:

- wood production,
- wood production of secondary significance(stumps),
- secondary forest use (hay making, grazing, bees, fruits, nuts, berries, mushroom collection),
- hunting activities,
- using the forests for research work,
- recreational use of forests.

According to the article 32 of the new forest code, the forest users can also include communities, juridical persons and citizens. Thus in the new forest code communities became as stakeholders and possible forest users. The forest utilization activities and responsibilities are the same as in the previous forest code.

1.1.5 Annual Harvesting Volumes Including Fuelwood Use

The current situation concerning the management and conservation of forest resources is critical, and does not correspondent to sustainable development. Approximately 70 000 m³ of timber is currently harvested in Armenia on official basis, of which about 20 000 m³ is considered commercial cuttings, a harvest which satisfies only 10-14% of Armenian internal needs. Actual harvest including illegal felling, according to several estimates, is about 500 000-1 000 000 m³ per year. The timber consumed by rural households, mainly for fuelwood, according to official data was estimated to be 568 000 solid m³ annually. It has been estimated that in each of the last six years at least 1 000 000 m³ of wood has been illegally cut, and this has damaged the forests as cutting has been done in an uncontrolled and disorderly manner (Government of Armenia 2002).

The harsh economic situation in the 1990s has created a great demand for wood products. Large peri-urban areas have been denuded of forests, negatively affecting soil and water

resources. It is feared that rare species, both flora and fauna, disappear continuously. The cooperation between the concerned ministries and authorities when it comes to sustainable forest management and use is almost non-existent.

1.1.6 Economic Contribution of Forest Sector (e.g. with respect to GDP, Export Trade, Employment)

The contribution of the agriculture sector to Gross Domestic Product (GDP) during last five years has been the following: 1999-31.2%, 2000-27.3%, 2001-29.8%, 2002-27.7%, and in 2003-25.3% (Statistical Yearbook of Armenia 2004). Thus the share of agricultural contribution in general switched from 1/3 (1999) to 1/4 (2003). The share of employment in agriculture and forestry constituted about 46% (2003) of total employment in the economy (Statistical Yearbook of Armenia 2004).

The number of employees in the forest sector is 1 370 (2004), 1 135 to 1 175 in Forest agency and Hayantar of MoA, and 195 in BMA Inspectorate of MoNP.

The land reform in 1991 has resulted in the privatization of most agricultural land (tillable land, not grazing areas) and livestock, resulting in an estimated 330 000 new landholders, most of whom lack the experience and skills in modern agriculture and sustainable land use practices.

As a result of the economic collapse, which affected wood processing industries disproportionately, the reported contribution of the forestry sector to the national economy has shrunk to less than 0.5% of GDP (WB 1997). Forests are a source of timber, fuelwood, non-wood forest products, game meat and recreation for a large number of people whose salary levels are inadequate for household requirements. Forests are also a greenhouse gases sequestration sink and carbon storage, which is not included in GDP calculations. The contribution of forest sector (including legal and illegal parts) to national economy is not presented in the complete Statistical Yearbook of the Armenia 2004.

1.1.7 Proportion and Number of People Dependent on Fuelwood for Energy

According to the conducted survey (Min. of Nature Protection/SIDA 2004), the population living within ten kilometers in the eight regions (marzes) where forests exist amounts to 558 000 out of 3.3 million of total population. From the household survey, minimum number of households in this population will be at least 119 748. The average firewood consumption for all households is estimated at 6.8 m³/year. The minimum firewood consumption within this population is therefore 756 750 stack measured m³ which gives solid wood equivalent of 567 563 m³, assuming a conversion rate of 70%.

Of the 599 households surveyed that use firewood, 63% purchased some of their firewood from others. 3% of the survey obtained firewood free from relatives or neighbors. The remaining 37%, collected their firewood themselves. Of these, 11% collected some of their firewood from orchards and 8% from waste wood not from the forest.

1.1.8 Treatment of Illegal Logging in Overall Government Policies and in Those Related to Forest Sector as well as in International Agreements the Government Is Signatory To

Since independence till nowadays Armenian government did several efforts to stop or regulate on-going illegal cutting. Thus in 1995 government, thanks to technical assistance provided by FAO, tried to work out a national forest program (NFP) but that initiative ended with some general statements.

Later several governmental initiatives came up in this area.

The Reforestation and Forest Development Fund (RFDF) was established by Armenian Government Decree N891 of June 10, 2004. Assisted by the RA Ministry of Agriculture, the RFDF had managed to implement specific action aimed at forest rehabilitation in Armenia since that time. In particular, according to the executive director of RFDF, in compliance with the agreement signed with “Hayantar” CSJSC, AMD 20.5 million-worth of reforestation work was carried out on 34 hectares of the Nork Forest in Yerevan. AMD 1.8 million were saved as a result of the settlement of the contractual AMD 18.7 million to “Hayantar” CSJSC.

The Inter-ministerial Taskforce (IMT) on illegal logging was established in 2004 to coordinate governmental efforts on decreasing of illegal logging. IMT cooperates closely with WB in this respect.

Armenia government is not signatory to any international agreements with reference to illegal logging and timber export/import. Instead Armenian government is signatory to the following agreements, which are broadly relevant to forests and illegal logging:

- Environmental Impact Assessment in Transboundary Context (Espoo) 1991,
- Convention on Biological Diversity (Rio) 1992,
- Framework Convention on Climate Change (New York) 1992,
- Convention to Combat Desertification (Paris) 1994,
- Kyoto Protocol 1997,
- Convention on access to information, public participation in decision-making and access to justice in environmental matters (Aarhus) 1998.

1.1.9 Ongoing Major Programs to Address the Governance Weaknesses in Sectors Relevant to Forestry Including Those Supported by the World Bank

The on-going major programs to address the governance weaknesses in the sectors relevant to forestry included: National Forest Policy, New Forestry Code and Illegal Logging Action Plan within forestry component of WB NRMPRP, PRSC within WB program and Reforestation and Forest Development Fund (RFDF) activities established by Armenian government.

NRMPRP is the biggest on-going activity in the forestry sector to address governance weaknesses.

For the 2002-2008 period WB has initiated the Natural Resources Management and Poverty Reduction Project (NRMPRP). The total worth of the project is USD 16 million, of which USD 8.31 million is IDA credit, USD 5.12 million is GEF grant, USD 1.06 million is Swedish Government grant through SIDA and USD 1.51 million is contribution from Armenian Government. NRMPRP is divided into four components, of which forestry is one of the important components. USD 4.03 million is dedicated for the forestry component to strengthen legal and institutional framework, increase human resources capacity and demonstrate improved forest management practices. The Forest Institutional Support Project (FISP) component, financed by SIDA, worked out an Illegal Logging Report (Min. of Nature Protection/SIDA 2004) and Illegal Logging Action Plan, adopted by governmental decision on 30 September 2004 (decision N38, Government of Armenia 2004). FISP is also working on the NFP, which currently is in discussion process. Finnish Savcor Indufor Company contracted by NRMRP worked out a FMP for two forest enterprises in northern Armenia, and the first community-based FMP for two forest dependent communities in north-eastern Armenia.

Thanks to NRMPRP essential changes are taking place in the forestry sector in terms of human resources development. The NRMPRP tries to work out NFP, new forestry code and illegal logging action plans. Different stakeholders were involved in the preparation of those documents and benefited from experience exchange.

The Government's intention is to involve all relevant stakeholders in the discussion and decision-making process on any kind of reforestation, afforestation, forest utilization, protection and monitoring systems. Participatory approach and discussion on different levels with involvement of central governmental and local authorities, public organizations, NGOs and local communities will provide stable base for goal oriented and effective management of national forest resources.

The WB's new initiative "Support to implementation of poverty reduction strategy in Armenia" will essentially promote the above-mentioned transformations. The WB in November 18, 2004 approved a Poverty Reduction Support Credit (PRSC) for Armenia, which is worth USD 20million. The start of a three-year program by the WB, this project is designed around four themes and targeted to support the implementation of the government's PRSP program. The fourth component of PRSC is dedicated to interventions in the rural economy which cut across the agriculture, non-farm incomes and infrastructure sectors. Greater predictability and sustainability in public services in rural Armenia is expected to strongly benefit the fight against poverty. This project will also benefit from a EUR 4.3 million co-financing grant from the Netherlands Government, which together with PRSC funds will support the State budget.

SIDA has provided support for Swedish University of Agricultural Sciences (SLU) and Armenian Agricultural Academy (AAA) long-term (2001-2007) cooperation in the forest education field. Thanks to this cooperation in 2003 the Forestry Department was established at AAA. This is a very important point for the whole forest sector of Armenia, as before higher forestry education was absent in the country and few specialists got their professional education in Russia, Ukraine, Georgia and elsewhere. SLU-AAA cooperation will provide equipment, reference library and other facilities for forestry education, as well as training and consultancy inputs. All young lecturers will be trained at different campuses of SLU, and will work with their corresponding colleagues to improve forestry curriculum and education

programs. This is a good chance to fill the professional void in the forestry sector, which is very urgent as currently only 4-5% of the employees have to some extent forestry education.

1.2 Definition of Illegal Logging

1.2.1 National Definition of Illegal Logging

There is no national definition of illegal logging in Armenia.

According to the 1978 USSR Forest Code all forests in Soviet Union were divided into three major groups: protected forests (Group I); forest with restricted industrial uses (Group II); and industrial forests (Group III). Group I was composed of all forests managed with conservation and protection objectives such as state reserves and sanctuaries, forests in riparian areas, around towns, communities and resort towns, forests bordering steppe zones, natural forests or plantations for soil conservation, and conservation of biodiversity. In these forests only sanitary (dead, infested or diseased trees) and reproduction (over mature forests to promote regeneration) cuttings were allowed. In 1978 all Armenian forests were designated as Group I forests. All types of logging which do not meet Group I definition and limitations are considered in Armenia as illegal.

1.2.2 Compatibility of National Definition with the Definition in the Terms of Reference

Thus, the compatibility of Armenian understanding of illegal logging coincides with the definition of illegal logging presented in the Term of Reference (TOR) of this study in the following cases:

- outside a concession area
- in excess of quota
- in a protected area
- without appropriate permits
- without complying with bidding regulations
- without submission of required management plans
- in prohibited areas such as steep slopes, river banks, and water catchments
- that contracts with local entrepreneurs to buy logs from protected areas
- removing of under/over sized trees from public forests
- reporting high volumes extracted from forest concessions to mask that part of the volume is from non-authorized areas outside of the concession boundaries
- using bribes to obtain logging concessions
- using deceptive transfer pricing and other illegal accounting practices to distort prices, volumes, cash flows and debt service levels
- that engages in the illegal transport and trade of timber or the smuggling of timber
- that is processed without the required licenses

2. ILLEGAL LOGGING

2.1 Volume of Illegal Logging

There are several and very often contradictory data and references on the volumes of illegal logging that has taken place after Independence in 1991. The first years of independent Armenia were harsh. The political and economic transitions which were difficult in themselves were further complicated by the 1988-1994 war with Azerbaijan, and the disruption of transportation and supply networks of goods, services, and energy (oil and gas from other Soviet republics) that occurred with the disintegration of the USSR. These events created an energy crisis that had vast impacts on the Armenian environment and most of all on crucial mountain forest ecosystems. Below are presented references from different sources including official data, study results and professional forester estimations.

According to official report from 1995 (Ter-Ghazaryan et al. 1995) plans were made to supply fuelwood to the population during 1993. Before 1993, the fuelwood cut was usually fixed at 60 000 m³ per year, of this about 8 000 m³ were considered selective cuttings, 45 000 m³ from thinning and sanitary cutting, and about 10 000 m³ were dry wood collected in the forest. The majority of the wood collected and harvested was for fuelwood. Only about 12 000 m³ were for logs to be sawn in sawmills of Forest Enterprises. In 1999 the harvest was raised to 100 000 m³, of which about 45 000 m³ was allocated for fuelwood. In addition, the plan called for the collection of snow-break trees. Approximately 200 000 m³ quotas were allocated among the several FE. In reality, the plan was difficult to realize because of fuel limitations, and the transportation of the wood to distribution areas was a major impediment.

Estimates (WB 1997) of the volume of the illegal cutting suggest that 700 000-1 000 000 m³ of wood were cut illegally in each of three winters 1992-1995. The visible scars from the uncontrolled cuts (about 10 000 hectares were clear cut) have raised public awareness of the environmental consequences of illegal forest use.

Due to energy crises, the forests in Armenia were considerably damaged. Illegal cutting and grazing resulted in the partial or complete destruction of 27 000 ha (8.1% of the forested area) of forests and young plantations, of which 6 000 ha were clear-cut (Petrossian 1997).

According to forest resources assessment data (Thurresson et al. 1999) forested areas close to population centers became the main source of fuelwood during the winters of 1991-1993 and were heavily damaged. As a result, nature protection, and aesthetic and sanitary-hygienic situation in the settlements has substantially worsened. Legal cuttings during 1991-1996 were 150 000–250 000 m³, but results of the 1998 assessment provided by the FREC with financial assistance from SIDA estimate that cuttings (legal and illegal) during those years were 600 000 m³ (Thurresson et al. 1999).

In Yerevan, for instance, some 60 000-80 000 trees were clear cut though they would have been a significant tool in combating the impact of industrial emissions (<http://www.aua.am> - Environmental Conservation and Management Center's Report 1997).

According to the official paper (decision N38, Government of Armenia 2004) illegal logging in Armenia is conducted mainly by local communities for survival through unauthorized timber extraction from the state forests. The timber consumed by rural households according

to studies was estimated to be 568 000 solid m³ annually. Unauthorized timber selling for commercial purposes in city centers, calculated on the basis of transportation and sawmills data analyses and limited illegal logging for commercial wood processing was estimated to be 150 000 solid m³. The overall timber production was estimated at 847 000 solid m³ in 2003, from which officially allowed and registered volume constituted 63 000 m³.

According to country profile provided by Armenian government to Johannesburg summit in 2002 (Government of Armenia 2002) the current harsh economic situation has created a great demand for wood products. Large peri-urban areas have been denuded of forests, negatively affecting soil and water resources. It has been estimated that in each of the last six years at least 1 000 000 m³ of wood has been illegally cut, and this has damaged the forests, as cuttings were done in an uncontrolled and disorderly manner. Rare species, both in flora and fauna, are under continuous danger. The state institutions responsible for forestry are weak, the regulatory system is poorly developed and there is a lack of forestry experts. The current situation concerning the management and conservation of forest resources is crucial, and does not correspond to sustainable development approach. Approximately 70 000 m³ of timber is currently harvested in Armenia on official basis, of which about 20 000 m³ are considered commercial cuttings, a harvest which satisfies only 10-14% of Armenian internal needs. Actual harvest including illegal felling, according to several estimates, is not less than 500 000 m³ per year. Since the country produces a very high quality of beech and oak hardwood, foreign exchange could be earned through forest related products - in spite of the low self-sufficiency rate - if internal needs were satisfied with lower quality lumber leaving the possibility of using higher quality wood for production of export goods.

The figures above differ essentially from local professional forester's estimations. According to the previous head of Ecology and Agriculture Department of Lori Regional Administration the overall volume of annual cutting equals to 500 000 m³ only in Lori region. Meanwhile official annual cutting for Lori region is estimated at 25 000 m³ of timber, 5 000 of which is used in construction. A previous regional state officer has indicated that every day about 1 000-1 500 m³ of wood is transported to various parts of Armenia from Lori forests. Although the forestry service fulfills state orders, they face financial difficulties, and cannot pay salaries. "It is unbelievable that a forestry sector where thousands cubic meters of woods are cut down can be in financial trouble". This is made possible through protection by senior officials in the military and law enforcement agencies. Anyone in doubt can go to the Vanadzor-Yerevan highway in the early morning hours and count how many trucks loaded with wood are driving toward Yerevan. The drivers like to travel at night and in the early morning to keep out of sight. "I will tell you something else- this year a state order for 3 000 cubic meters of wood was placed with the Gugark forestry service, where there are almost no trees left because of the mass deforestation. And I think that all this is taking place on purpose- all this illegal cutting is carried out under the cover of state orders. It is a coded message for the illegal woodcutters to tell everybody that they are fulfilling state orders", the same official explains.

Thus, despite the sometimes contradictory character of references one could conclude that starting from independence till nowadays annual cutting volume constituted around 1 000 000 m³ (might be sometimes a bit less, sometimes a bit more) which makes 13 000 000-14 000 000 m³ wood for last 13-14 years (1992-2005). The last figure could be compared with absolute annual growth which constituted about 450 000 m³ (according officially accepted growth rate) or 600 000 m³ (according Thuresson et al. 1999). This relation means

that forest management and forest utilization practices were and are dramatically wrong and have caused degradation of forest ecosystems throughout all country.

The state and trends in legal and illegal cuttings are depicted in the following Tables 2.1-2.3.

Table 2.1 Summary of Legal and Illegal Logging Volume in According to Different References*

Total volume of illegal logging	Fuel-wood share in legal and illegal logging	Industrial wood share in legal and illegal logging	Reference
206 600 (1993)	190 500	10 100	Ter-Ghazaryan et al. 1995
700 000-1 000 000 (1997)	600 000-850 000	100 000-150 000	WB 1997
600 000 (1998)	450 000-400 000	150 000-200 000	Thuresson et al. 1999
1 000 000 (2002)	800 000-750 000	200 000-250 000	Government of Armenia 2002
847 000 (2004)	568 000	279 000	Ministry of Nature Protection/SIDA 2004

* Quantity of legal logging should almost always be considered 60-70 000 m³

Table 2.2 Summary of Planned and Official Timber and Firewood Production Statistics for the Period 1999 to 2003

Year	Planned		Actual		
	Timber	Total	Timber	Firewood	Total
	Volume (solid m ³ /year)				
1999	13 032	55 00	5 273	50 687	55 960
2000	18 944	71 000	12 640	48 940	61 580
2001	16 850	70 000	10 805	47 076	57 881
2002	14 050	70 000	12 833	45 102	57 935
2003	13 860	70 000	13 164	57 914	71 078
Average	15 347	67 200	10 943	49 944	60 887

Source: Ministry of Nature Protection/SIDA 2004

Table 2.3 Comparison of Log Volume Production Statistics

Data type	Volume (solid m ³ /year)
Planned volume (FEs + Dilijan)	77 000
Actual Recorded Legal (FE + DNP)	62 793
Illegal detected by FE + Dilijan	3 098
Illegal from Biannual Survey	25 264
Illegal from Inspectorate (2003 figures)	1 300
Total from truck movements	213 052
Illegal from truck movements	150 259
Community consumption	567 563

One can see a big gap between official and other sources (public organizations, NGOs, forest experts, etc.) data on volumes of legal and illegal logging, and there are differences even between different governmental papers. The reason for this is the large information gap, and the lack of appropriate contacts and discussions between governmental agencies themselves dealing with forest resources and between authorities and public organizations. The lack of corresponding monitoring system and reliable data on natural resources utilization is a major constraint to accurate estimates.

According to the Statistical Yearbook of Armenia 2004, the number of forest breaches was as follows in the last five years: 2 052 cases in 1999, 1 974 cases in 2000, 1 967 cases in 2001, 2 256 cases in 2002 and 1 927 cases in 2003. Of these forest breaches illegal forest felling took place correspondingly in the following number of cases: 1 931 cases in 1999, 1 907 cases in 2000, 1 658 cases in 2001, 2 065 cases in 2002 and 1 732 cases in 2003.

According to FAO statistics in 2003 (<http://www.fao.org/forestry/site/18308/en/arm>) the volume of traded forest products was as follows: 10 000 m³ of round-wood, 8 000 m³ of fuelwood and charcoal, 3 000 m³ of industrial roundwood, and 2 000 m³ of sawnwood. The volume of forest products which were imported is reported at USD 83 767 000 and the exports at USD 31 485 000. If one will take into account that the current state budget is close to USD 650 million, the share of exported forest products will constitute about 5%.

2.2 Types of Illegal Logging

Prior to Independence in 1991, as was mentioned above, about 60 000 m³ timber was harvested in Armenia annually, of which 12 000 m³ were commercial logs, and the remaining 48 000 m³ came from sanitary cuttings and thinnings. 10 000 m³ out of 48 000 m³ were used for particle board production and the rest went for fuelwood. This fuelwood, until 1991 did not have much commercial value and most of it was burned by Hayantar. 7 500 m³ boardwood was produced from 12 000 m³ of commercial logs. The rest of commercial logs, 4 500 m³, were wood waste from log processing and were sold as fuelwood or burned on site.

In 1993 Hayantar (State forest agency) exceptionally harvested 202 000 m³ (cuttings and drywood), of which 34 000 m³ was logs, 12 000 m³ was used for particle board production, 5 000 m³ were sold to state enterprises and the rest processed in the Hayantar sawmills.

In 1996 the total amount of legally harvested wood was 87 000 m³. This includes also drywood collection.

Apart of this legal 60 000 m³ annual cut, Armenian wood processing industry (composed of 18 sawmills, one veneer and 12 woodboard factories, 34 wood processing plants and one paper factory) imported and processed annually about 800 000-850 000 m³ of wood and logs before independence, most of which was softwood from Russia (WB 1997).

Thus before 1991 Armenian wood processing industry consumed about 900 000-1 000 000 m³ of timber, 95% (mainly as roundwood and sawnwood) of which was transported by rail from Russia. After 1991 this import ceased. Taking into account the size of the current wood-based economy in Armenia one can assume that starting from 1992-93 till nowadays the previous import volume from Russia was replaced by wood supply from Armenian forests

mainly through illegal cuttings. Thus about the same assortment as before 1991 is currently produced in Armenia. The Illegal logging study (Min. of Rep. of Armenia/SIDA 2004) claims that local communities play a major role in illegal timber extraction, which is far from reality. It might be that it was the case in 1992-1995 when there was a real energy crisis and people were forced to cut forest for fuelwood. It is hardly the case any more.

Currently in many parts of Armenia natural gas is being intensively introduced, which hopefully will decrease the pressure on forests as a main source for fuelwood and heating. Also the calculation of the number of households dependent on fuelwood is highly doubtful as it is not logical to assume that all households who are close to forest areas will use fuelwood for heating and cooking. It is also evident that local community members will not go to forest and cut valuable trees for fuelwood preparation. On the contrary, local households have traditionally extracted fuelwood for many years without any threat to forests. Instead it is logical to think that there is a well-established chain of timber cutting and wood processing industry, which starts in the forest and ends in Yerevan or other big cities. Local community members are, however, used as cheap labor force by private wood processing companies.

In 1998 the Yerevan Brandy Company (YBC) agreed with Armenian government to buy annually 2 000 m³ of high-quality oak from Armenian forests for a period of five years in order to produce new barrels for the ageing of the brandy produced in Yerevan. YBC originally explored various alternatives for purchasing the quantities of oak wood required for the production. However, as part of the policy to produce Armenian brandy, YBC decided that purchasing mainly Armenian oaks through the Armenian forest administration (Hayantar) would be the best choice. Another alternative would have been to import oak wood from neighboring countries. According to Armenian Forest code from 1994 (still in force), only sanitary and improvement cuttings are allowed in Armenian forests (i.e. removal of dead, infected and very old trees), and cutting down healthy oak trees is prohibited under any circumstances. It is evident that the agreement with YBC was against this legislation as it is impossible to provide high-quality oak timber for barrel preparation based on wood from sanitary and improvement cuttings.

The country's forestry service will supply this wood to the distillery at an agreed price of USD 120 per m³. Experts estimate that the market value of timber of this quality oak is USD 200 per m³. Within the fifteen years of the agreement, 30 000 m³ of high quality, often centuries-old oak, will be felled because the government has favored a private company.

2.3 Exports of Illegal Timber

According to the Customs Department and the Statistical Office of Armenia, the volume of wood exported from Armenia has risen sharply over the last four years (<http://www.hetq.am>). During the Soviet era, the republic imported, rather than exported, wood. Today the nearly forestless Armenia exports not only wood products but roundwood as well. These are the volumes (in metric tons) of wood exported from Armenia during 1999-2002 (<http://www.hetq.am>) (Table 2.4).

The main export is roundwood which goes to Iran, France, Spain, the United Arab Emirates, Germany and Russia. As an example, in 1999 17 Greek walnut trees, which are registered in the Red Book, were cut down in land privatized by village communities in the Kapan region

and in areas belonging to the forestry service. Logs and roots from the walnut trees were stored and exported to Turkey, Italy and Russia. Their wood is used for furniture and luxury car interiors. The trees were felled with the written permission of the local government.

Table 2.4 Volumes of Wood Exported from Armenia in 1999-2002

Item	1999	2000	2001	2002
	metric tons			
Longitudinally cut timber	107.0	1 839.7	1 484.6	2 291.6
Raw timber	484.9	977.0	483.0	2 158.2
Single-layer board	133.7	46.0	112.0	243.0
Wooden building materials, particle board	79.1	148.3	186.7	25.9

Source: <http://www.hetq.am>

Note: The conversion factor is different for different tree species and ranges between 0.45-0.7, i.e. 1 m³ of timber is equivalent to 450-700 kg timber.

2.4 Impact on Government Finances

According to information given by the Minister of Nature Protection the sale of timber has contributed AMD 1 billion (about USD 1.8 million) to the state budget in 2002 (<http://www.hetq.am>).

In Dilijan National Park during 2003, 153 protocols registered for forest violation, which covered 335 trees with a volume of 194 m³. Of these 111 cases (186 trees) were settled voluntarily with a value of AMD 1 414 000 (about USD 2 550). The remaining 46 cases (value of AMD 1 393 000-about, about USD 2 500) were forwarded for prosecution (Illegal logging, 2004).

Currently the energy crisis and energy related fuelwood cutting has somehow slowed, however, it is estimated that 4% of the state budget will be required to stop any further degradation of natural resources (<http://www.cornellcaspien.com/sida/sida-reg-6.html>). This indicates that the Armenian government each year loses about 4% of national budget due to inappropriate forest management and utilization. 4% in the case of USD 600 million budget (2004) will constitute USD 24 million. This is a very general figure, which gives an idea of illegal logging impact on government finances. This estimate is well supported by data provided by FAO.

Based on the estimates on the volume of illegal logging for subsistence consumption and commercial sales, 567 000 m³ and 150 000 m³ respectively, the following estimates can be provided. If the volume of fuelwood consumed by local communities within 10 Km of the forest had been sold at AMD 2 500 per stacked m³, the revenue would amount to AMD 1.89 billion per year or approximately USD 3.6 million annually. If the minimum illegal transported volume of 230 000 stack m³ (300 000 stack m³ less the official recorded production of 70 000 m³) was sold for AMD 2 500/stack m³ then the lost revenue amounts to AMD 575 million or USD 1.1 million per year.

2.5 Threats to Environment

Extensive forest cutting has caused soil erosion and also affected water resources in forested areas. Heavy soil erosion process has started on the clear-cut areas near the town of Vanadzor. Already during 1994-1997 more than 100 ditches of different depth appeared (Petrossian 1997). Landslides, salinization and other soil degradation factors have also been observed (Figure 2.1).

The forest is overall poorly managed, with bad cutting regimes, scarce regeneration activities, “creaming” forest operations, etc., meaning that right now the forest is over-utilized. This is not only in terms of volumes but what is worse in terms of useful tree species. The valuable beech, oak and pine trees, which primarily are being logged, is to large extent replaced by forest rich in hornbeam.

Due to intensive forest utilization in the past ten years, some 26.2% of beech forest has been converted to coppice forest, and currently only 10.3% of beech forest is reported to have high density. Oak forests, having a 31.3% mature and over-mature trees, are in the most critical condition. Besides, the age structure of forests (the average age being 90 years, pre-mature trees amounting to 6.5% of total) has a negative impact on future development of forest resources in the country (American University of Armenia 2000).

The average canopy closure of the Lori forests during 1980s was 0.6-0.7. No studies have been conducted since Armenia’s Independence, but the previous Head of Ecology and Agriculture Department of Lori Regional Administration estimates that the current density here is 0.3-0.4. These cannot be considered as forests since they have lost the ability to regenerate on their own.

Biodiversity values are more or less neglected as for now, despite the existing policy which is very protective towards these values. Some cases of illegal cutting were recorded even in the protected areas (Figure 2.1). Due to the illegal collection of unique and relict plants the Armenian flora has been unrecoverably damaged. This cutting usually takes place in the central part of protected forest, so the outer boundaries remain untouched and it appears that there have been no cuttings. This kind of cutting process is taking place in all forest reserves.

Forested areas close to population centers were the main source of fuelwood during the winters of 1991-1993 and were heavily damaged. As a result, both nature protection and the aesthetic and sanitary-hygienic situation in the settlements has substantially worsened.

In the basin of lake Sevan approximately one fourth of artificial forests have been cut clear. This forest belt was created by long and hard work but was damaged in a few years. It was created for protection of areas that appeared after the lake-level decreased. After these cuttings the ecological state of lake became even worse (Sayadyan 1999).

The other worrying ecological situation is due to the cutting of bushes, especially in the southern part of republic where the climatic conditions are quite dry. These cuttings will accelerates the erosion process and will create conditions for mudflow formation during short intensive rains which are very common in the summer (Sayadyan 1999).

Figure 2.1 Landslide Due to Deforestation in Northern Armenia



3. GOVERNANCE

3.1 Policy Framework

In the first forest policy paper, adopted by the Government of Armenia in 1996, the main objectives of the Armenian forest policy were declared as follows:

- Create conditions, which lead to proper economic utilisation.
- Be consistent with other national policies, especially those concerned with environment, agriculture, forest industries, and rural development.
- Take account of recent developments in the forest policies in developed countries.
- Strengthen the institutional capacity for forest policy formulation, monitoring and execution.
- Enhance forest regeneration, afforestation, and rural forestry.

A new forest policy was approved in October 2004 as was the illegal logging action plan (ILAP) both by the Council of Ministers. In the introduction part of new National Policy and Strategy document, which was developed within ongoing FISP of WB NRMPRP it is written that “The main goal of national forest policy for the Republic of Armenia is provision of sustainable management of forests and forest-lands. The task for the government of Republic of Armenia is balancing nature protection and public interests, by creating conditions for the country development, keeping at the same time ecologic and social values of forests”.

As strategy goals are declared:

- Reforestation, development of useful features of forests and sustainable forest management.
- Institutional improvements and capacity building for the sustainable forest utilization, as well as establishment of forest conservation and protection services, seed, nursery and hunting farms, education and training centers and network.
- Scientifically proved, sustainable forest management plans (short and long term) creation.
- Provision of non-wood forest products sustainable utilization.
- Improvement of sustainable forest management legislative bases, including scientifically proved mechanisms (methodology, criteria, etc.), which take into account international experience.

However, as written in an Armenian discussion paper (Forest Research... 2000), “There is a strong black economy and a high proportion of the timber harvested is felled illegally. The state institutions responsible for forestry are weak, the regulatory system is poorly developed and there is a lack of forestry experts.” This, in addition to lack of funding, traditions going back to the Soviet style management, and corruption have resulted in that little of the policy seems to have been implemented. The illegal or otherwise poorly controlled cuttings also create a situation where the forest policy is hard to implement. Also, many sources claim that many forestry officials and politicians get their share of the illegal cutting activities, hindering strong actions against these activities.

There are objective and subjective reasons behind illegal logging, part of which are outside of forestry sector. The means to minimize illegal logging conducted by state authorities, particularly in forested regions, are un-satisfactory and so far have not been able to provide a solution to this problem.

3.2 Legal Framework

According to the Forest Code of 1994, all land under forest is considered to be state owned. As owner of the forest resource the state therefore decides how the resource can be exploited and managed.

Under the Forest Code of 1994, wood and wood products can be sold through a variety of methods (Min. of Nature Protection/SIDA 2004):

- Forest can be allocated on a short term (up to five years) or long term (up to ten years) forest use agreement approved by the head of Hayantar, in which forest use fees and terms are defined. Although forest use agreements were envisaged in the 1994 Forest Code none have actually been concluded for the exploitation of wood resources. There is no method as yet of calculating how the user would pay the state for the use of its forests.
- Forest Cutting Coupons which give the holder the right to extract a defined quantity of timber and secondary wood products (e.g. stumps), issued by the Forest Enterprise at prices agreed by Hayantar. Prices are set centrally by senior management and take into consideration local and international market prices. The last update was as recent as March 1 2004. The previous price list was valid from 2001. Hayantar then pays the Nature Use Fees for the exploitation to the Government, at rates determined by Government

decision. The current table of Nature Use Fees set in 1998 is presented in Annex 4. The Forest Enterprises can also sell wood felled at stump or extracted to roadside, but the sales price would then include the cost of felling and extraction as appropriate.

- Forest Coupons are issued for the collection of fallen trees and waste wood material from the forest at half the rate for Forest Cutting Coupons. This method is frequently used for the local sale of firewood.
- An entire annual cutting area can be sold by competitive auction, under the Ministerial (MoNP) Order (N36, of 20 March 2002). However use of this system has not been extensive and participation has been so far limited to Armenian companies.

Each year Hayantar monitors illegal activities in the forest through the reports from the forestry protection staff on a biannual basis when field surveys are undertaken. Forest protection staff also patrol their areas on a routine basis to check the legality of all felling, hunting, grazing and hay-making. Any violations are reported through an official protocol procedure. For each offence a protocol is prepared. If the offenders are caught they are asked to pay three times the official permit fee for the given product. If they decline the case can be taken to court. Table 3.1 presents a summary of the detected logging offences (Min. of Nature Protection/SIDA 2004). The average volume of illegal logging detected by Forest Guards comes to just under 4 000 m³/annum.

Table 3.1 Logging Offences Officially Detected by Year

Year	Logging			
	Protocol	No of trees	Volume (m ³)	Value ^a (AMDx10 ³)
1998	1 542	12 094	5 723	55 702
1999	1 827	14 087	6 107	50 311
2000	1 855	6 704	2 545	22 835
2001	1 412	5 188	2 291	19 404
2002	1 820	8 869	2 904	32 918

Source: *Hyantar Statistics in Manerseryan, 2003*

Note: ^a The value quoted is for three times the official permit fee as prescribed in the law.

Once an offence has been detected, the offender is given the chance to pay three times the official permit fee for the amount of wood that has been illegally taken. If the offender declines, the offence may be sent to the court. Table 3.2 shows for all forest offences (including other offences such as illegal hunting, grazing, cutting of hay etc, although illegal harvesting accounts for 96% of the value) how many cases are paid voluntarily, how many are sent to court and of those how many are settled by the court (Min. of Nature Protection/SIDA 2004).

The level of transparency and adequacy of the procedures related to timber sales can be judged through the attached Annex 2.

Table 3.2 Number and Value of Offences, Paid Voluntarily, Sent to Court, and Settled

Year	Total		Voluntarily paid			Sent to legal bodies			Settled		
	Protocol	Value AMDx10 ³	Protocol	%of total	Value AMDx10 ³	Protocol	%of total	Value AMDx10 ³	Protocol	%of sent to court	Value AMDx10 ³
1998	1 776	57 445	964	54	10 072	395	22	42 142	79	20	3 898
1999	1 935	51 152	1 062	55	12 238	420	22	35 230	96	23	2 525
2000	1 987	23 778	905	46	9 619	700	35	12 644	134	19	2 142
2001	1 529	21 874	795	52	5 855	481	31	12 926	119	25	2 338
2002	1 992	35 069	1 301	65	12 959	396	20	19 087	142	36	3 000

Source: Hyantar Statistics in Maneseryan, 2003

3.3 Monitoring and Control System

3.3.1 Forest Inventories and Management Practices

The first and fundamental step in the management of any resource is to have an accurate estimation of its quantity, characteristics, and spatial distribution. A key characteristic of the forest inventory and management plans during the Soviet period was that they were centrally prepared (usually in Moscow or at a regional forestry office such as in Georgia) far away from the Armenian forests (Thuresson et al. 1999; Thuresson 2003). This arrangement together with other factors presented in the following paragraphs contributed to the deterioration of the Armenian forests during the Soviet period.

Forest inventories during the Soviet period were characterized by the use of “visual assessments”. Experienced foresters would walk through the forest stands and visually estimate key forest parameters such as age, height, diameter, and species composition. There was no use of sampling methods based on inventory sites or statistical methods to extrapolate the sampled tree’s characteristics to homogenous forests stands. Using aerial photography and/or field visits, these visual assessments first classified the forest cover into homogeneous forest stands, and then based only on field experience the stand characteristics and timber volumes were estimated. Obviously, this approach was highly subjective and made the estimation of key forest stand parameters such as the mean annual growth a guessing game. It has been proven that these practices grossly underestimated the mean annual growth of the Armenian forests (1.5 m³ per hectare versus 3 m³ per hectare by using sampling methods) (Thuresson et al. 1999). This underestimation had a major impact on the determination of allowable cuts and management regimes and led to the creation of over stocked and over-mature forests with low densities and low annual growths.

The first forest inventories in Armenia were carried out in the mid 1920s. Early in the history of the Soviet forest inventories the need to estimate the timber as well as the non-timber goods and services provided by the forests was recognized. This was very forward thinking for its time. The 1938 forest inventory in Armenia mandated the estimation of both timber and non-timber forest resources. However, the estimation of the non-timber goods and services (such as the protection to other resources) was even more subjective than the estimation of timber resources, and they never contributed to the estimation of an economic value for these resources. An efficient mechanism (such as subsidies or different kinds of incentives) to

translate the value of non-marketable goods and services into economic benefits to the inhabitants of the Armenian forests and/or the republic's economy was never developed.

Periodical forest inventories were carried out in Armenia in 1956-1958, 1966-1968, 1976-1978 and 1986-1988. These inventories followed the 1951 Forest Inventory Guidelines published by the Ministry of Forest Economy and were conducted by the Georgian Forestry Institute (under the Department of Forests of the Republic of Georgia).

The underlying perception in the USSR that drove most of the forest management practices was that the forests constituted a vast inexhaustible resource. This distorted perception led to a lack of interest in developing intensive silvicultural practices such as species composition management or intermediate cuttings (e.g. pruning and thinning) to improve the productivity of the forests. These silvicultural practices are of particular relevance to the type of forests existing in Armenia, but unfortunately this perception and protectionist policies prevented their implementation.

Most of the forest management practices carried out in Armenia during the Soviet period were protectionist in nature and ineffective. This trend increased starting in the 1950s when environmental considerations started to be emphasized. Over the years these protectionist policies created mature and over-mature forests (with an average age of 100 years) with low densities, very slow growth, and very low natural regeneration (Thuresson et al. 1999). It has been estimated that the current forest cover is growing at only 30-40% of the potential growth that could be achieved on an average stand condition.

On the positive side, from the 1950s to the 1980s approximately 90 000 hectares of forests plantations were established to protect soils and water resources (Khurshudyan et al. 1987). These plantations were mostly established around lake Sevan. This activity increased the forest cover in Armenia from 8% in the 1950s to 11.2% at the beginning of the 1990s.

Currently forest inventory is carried out by FREC, mainly through international support and professional assistance from Georgian foresters' side. Field inventory work is carried out in a step-wise approach on the basis of satellite images and old forest and topographic maps. After those activities new forest maps and inventory description books are worked out with recommendations on concrete forest management activities on stand level. FREC has only carried out inventory works for last couple of years, mainly thanks to international support, and has not been able to cover the whole country. There will be certain difficulties to continue inventory works once the international support will be cut. Thus the important issue here is the creation of corresponding human resources and facilities for forest inventory for the whole country with common methodology.

Despite this Hayantar is using this and previous (last forest inventory for the whole country was conducted in the beginning of 1990s) inventory data to plan sanitary and selective cuttings and other forest operations. Forest Enterprises have realised concrete cutting and reforestation activities in the forest on the basis of forest management plans based on old inventory data.

Inspectorate of MoNP have conducted control on the cut stands and check if forest operations were done in correct way, i.e. according forest management plans and cutting ticket. In the

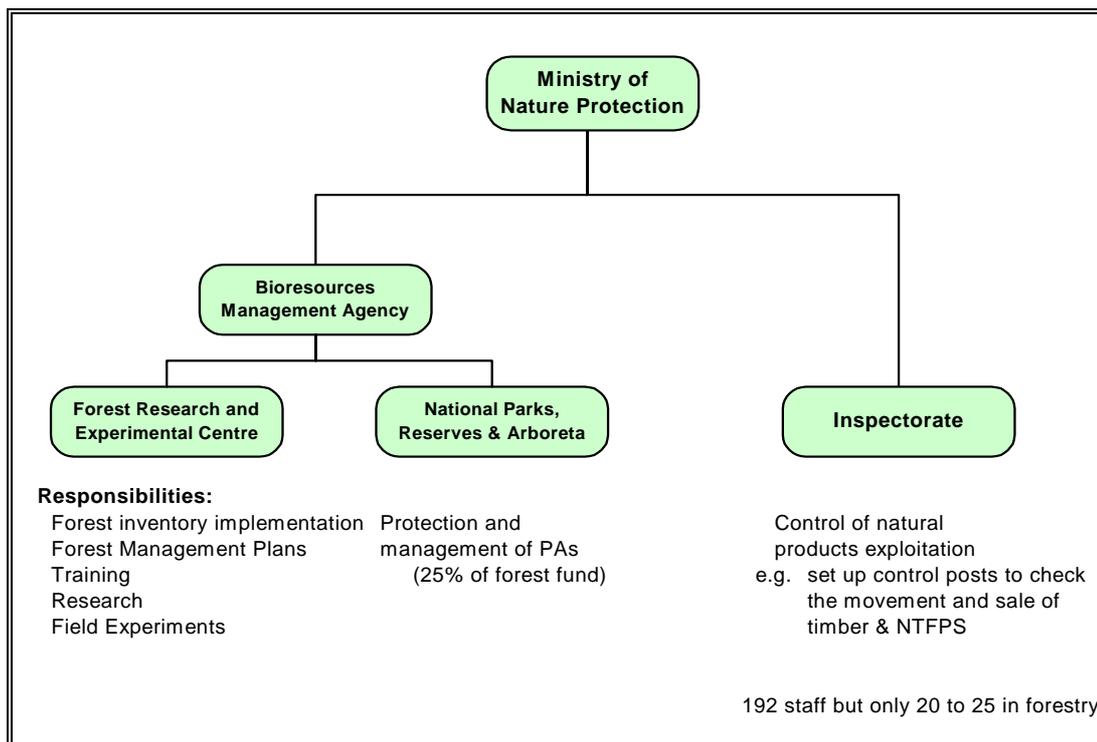
case of non-legal activities or over-cutting, the Inspectorate makes calculations of volumes and damages and processes data for the Ministry and courts in case of necessity.

There are no special forest machines to carry the cut timber. Instead lorries and general purpose trucks are used for this. The transportation and road network establishment is done randomly, without taking into consideration environmental issues and long-term forest management practices. Lorries and trucks are main transportation means from the forests to main cities and capital Yerevan, from where processed timber is exported by train, lorries and planes to several countries in Europe, Iran, Turkey, Arab Emirates, etc.

3.3.2 Forest Management Bodies

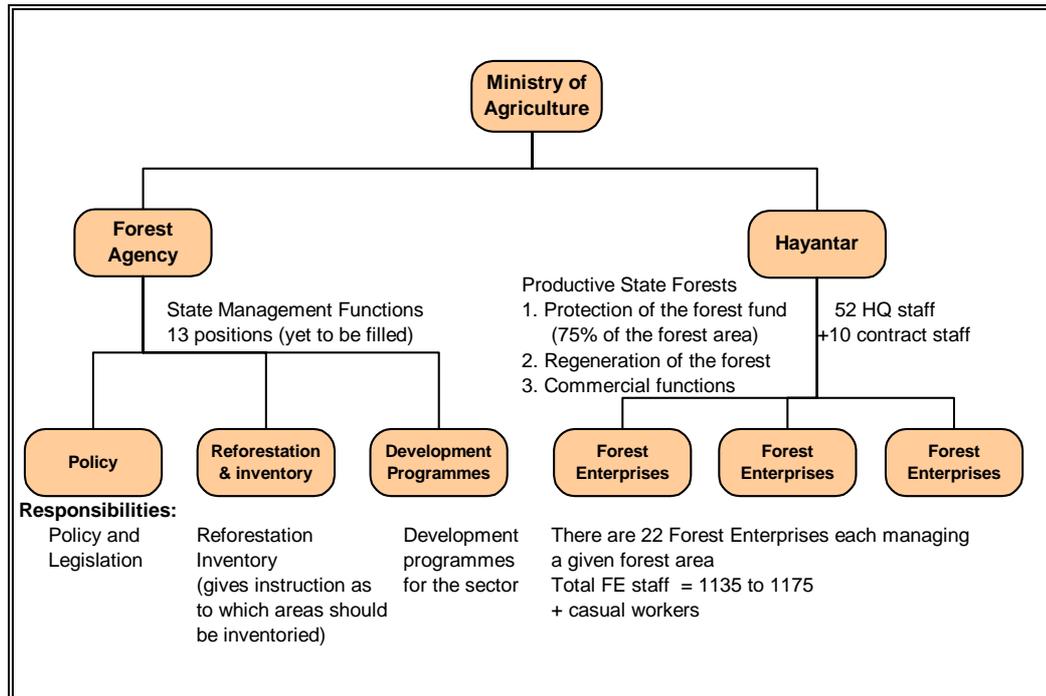
The main forest management body in Armenia is Hayantar CSJSC, which till January, 2004 was in the Ministry of Nature Protection (MoNP). Since that time Hayantar moved to the Ministry of Agriculture and passed through structural changes. The same kind of structural changes took place in the MoNP. The current structure of forest management bodies in the country is summarized in Figure 3.1 and Figure 3.2.

Figure 3.1 Organization Chart of Forestry within the Ministry of Nature Protection



Source: Min. of Nature Protection/SIDA 2004

Figure 3.2 Organization Chart of Forestry within the Ministry of Agriculture



Source: Min. of Nature Protection/SIDA 2004

MoNP has two main bodies-BMA and Inspectorate- mainly dealing with forest resources inventory, monitoring and inspectorate. Forest Research and Experimental Centre (FREC) provides inventory data and management plans for Hayantar. FREC also provides training and field experiments to Hayantar staff. The problem with FREC is lack of forestry professionals, experience and corresponding facilities. Essential point with MoNP is that about 25% of state forest estate is governed by National Parks, Reserves and Arboreta division of BMA, where lack of professionals, facilities and financial means result in very poor management practices.

The Inspectorate controls utilization of natural resources (including forest resources) legal utilization issues, it also manages control posts to check movement and sale of timber and NWFP. The problems here focus on human resources and financial means.

Currently the main governmental body dealing with Armenian forests is Hayantar, which administratively belongs to MoA (see Figure 3.2). Hayantar has central office in Yerevan, with five to six divisions and 22 forest enterprises directly belonging to Hayantar. The important issue with Hayantar is lack of professional foresters. Only 4-5% of all employees have professional education or training in forestry. The major parts of this 4-5% are rather old foresters (above 70 years old). The other big drawback with Hayantar is lack of corresponding material-technical bases, modern forest machinery, equipments and tools. This is mainly due to the difficult financial situation of Hayantar due to the imbalance between what Hayantar contributes to the State budget and what it receives as a budgetary allocation (Table 3.3).

Table 3.3 Hayantar Payments to State Budget and State Budget Allocation to Hayantar (2000-2003)

Financial flows	2000	2001	2002	2003
From state budget to Hayantar	99.7	90.0	114.0	114.0
From Hayantar to State budget	262.7	258.4	308.8	327.0
Relation coeff. between payments from Hayantar and state allocation	2.68	2.87	2.70	2.87

Million Armenian Dram-AMD, current exchange rate between USD and AMD is USD 1=465 AMD

For the first time in the beginning of 2004 Forest Agency was established in the MoA, which is supposed to provide policy, legislation, reforestation, inventory and development programmes to Hayantar. All these issues are underdeveloped which causes illegal activities and non-effective forest management practices in the country. The Forest Agency is very young and in some departments there are many vacancies to be filled.

3.4 Drivers of Illegal Logging and Suggested Responses

The main drivers of illegal logging are:

- very low commercial capacity of Hayantar,
- wood selling methods, which do not support development of free and equal market relations,
- low mechanization level of forest activities,
- difficult financial state of Hayantar,
- old accounting system of Hayantar,
- absence of forest management plans, which will provide sustainable forest management,
- absence of necessary equipment and financial resources for the forestry sector development.

In the proposed new forest policy the following reasons for illegal logging are mentioned:

- low salary of Hayantar employees,
- absence of economic, legislative and other mechanisms/tools to prevent illegal forest utilization,
- absence of illegal logging damages (damages to state, public, economy and environment) counting systems,
- ineffective system of illegal forest utilization registration and instructions' applications,
- absence of proper economic control,
- uncoordinated activities of local communities and forest enterprises to find and minimize illegal forest utilization,
- unsatisfactory level of awareness and information on the illegal forest utilization volumes and events,
- low level of material and technical promotion system,
- low local timber prices in comparison with international prices.

As a solution to these problems it is suggested to develop legal forms of forest utilization. It is also considered necessary to implement a situation study on all forest utilization phases and levels. More attention on forest management problems in governmental anti-corruption programs is also suggested.

In the new forest policy special attention and importance is given to community forestry. For now community forestry is an issue mainly on paper despite of the fact that within WB NRMPRP community-based forest management plans were worked out for two communities in northern Armenia. It is expected that forests around these communities will be allocated to them through Hayantar to test community forestry in the country. In general, communities were and still are too poor to overcome energetic and survival difficulties without over-pressure on forest cover. In some forest close communities the income is very low and households are unable to switch to the central gas supply system (American University of Armenia 2002). Electricity costs are also rather high to allow large-scale consumption.

Thus high prices on energy consumables drive householders to fuelwood extraction from surrounding forests. Those extractions frequently exceed the allowable levels and damage the environment. In addition to fuelwood extraction, households have uncontrolled impact on NWFPs, especially on berries, mushrooms, hay making and pastures.

The Illegal Logging Action Plan has been developed to address the issue from the supply side (i.e. what can be done to reduce illegal and increase legal supplies) and the demand side (i.e. reduce demand for illegal wood products). The solutions presented address indirectly the contributing factors: community consumption, commercial demand and monitoring and control. Accordingly, the recommended components of the action plan include:

1. Increasing public awareness;
2. Alleviating rural poverty;
3. Community forestry programs;
4. Alternative fuel supplies;
5. Increasing supply of legitimate wood products;
6. Restructuring forest institutions and capacity building;
7. Improved monitoring and control; and,
8. Forest Certification.

4. CONCLUSIONS

The forested areas and timber volume of the Republic of Armenia (RA) are scarce even comparing with mean world characteristics. Forests for such a dry country are very important for fighting erosion, for moderating climate conditions and for maintaining water sources in forested regions. But currently forest management and utilization in RA is not carried out effectively. There are many problems concerning forest resources assessment, inventories, mapping and using contemporary computer techniques and tools.

The high value of forests and bushes biodiversity make them objects of conservation and preservation for future generations. But there are difficulties to put these efforts within the framework of international standards.

Several key aspects of forestry activities have remained to a large extent unchanged since the Soviet period. Legislation is still centrally created (now in the capital Yerevan) containing lofty goals that are rarely implemented on the ground due to lax interpretation and enforcement. Forestry legislation and policy regarding the Armenian forests continues to be oriented towards protection and conservation, and has yet to consider other approaches, such as sustainable management, to manage the forests in the country. This ineffective policy, together with poor inventory and management practices, is still contributing to the degradation of the quality and quantity of the Armenian forests. The Government, the forest areas inhabitants, and the society as a whole, despite recognizing the importance of the forests in its different roles, have not been able to find the mechanisms to use, conserve and improve the Armenian forests.

Several aspects have also changed since independence. The centralistic policies of the Soviet system left Armenia without forestry education, and forests inventories and management infrastructures. Today there are significant efforts to develop these infrastructures in the country and to prepare a new generation of professionals with knowledge that is relevant to the social, economic, and environmental conditions existing in Armenia. Deforestation has accelerated since independence. The predominance of a black market economy of forest products is contributing significantly to deforestation, to the disappearance of the most valuable tree species, and to the degradation of the forest areas. Corruption and mismanagement are serious problems that compounded with the shortage of material, economic and human resources in the forestry agencies make it very difficult to implement any new policies and management regimes. The pressure that existed immediately after the independence on forests as a source of fuelwood has decreased in recent years as the supplies of energy and electricity have stabilized and become more reliable. As currently there is no legal way to obtain economic benefits from the forests in Armenia, the communities in the forest areas, economists and politicians have different interest regarding this resource.

Today the forest areas in the country are in very poor condition and are very fragmented. Legal and illegal cuttings are occurring in most of them. If the current economic conditions, forestry laws and policies continue, the country runs the risk of losing its forest cover within the next few decades. There is an immediate need to:

- (a) quantify accurately and expeditiously the stock, growth and conditions of the forests;
- (b) create a national forests information system to maintain and disseminate this information;
- (c) prepare management plans directed to rejuvenate the existing over-mature and over-stocked forests, involving local communities and channeling the economic benefits of these activities directly to them;
- (d) educate economists, managers, politicians and the society in general about the importance of the forests as part of ecological, social, and economic systems necessary for the subsistence of the country;
- (e) create an effective legislation and national forestry policy based on the principle of sustainability that can be effectively implemented on the ground;
- (f) assign an economic value to the non-marketable goods and services provided by the Armenian forests to be able to include them into accounting systems when developing plans, assigning economic stimulus and compensations, and evaluating the contributions of the forestry sector to the national economy;

- (g) transfer the property of the forests to local communities to avoid the effects of the Tragedy of the Commons that are currently prevalent;
- (h) establish stiffer penalties for corrupt administrators and politicians; and finally
- (i) promote international agreements (such as the certification of forest products as having been produced ecologically and legally) that will eliminate the huge profits of black marketers who export high quality timber to Iran, Turkey and Europe.

5. RECOMMENDATIONS

On the base of these conclusions one could make the following recommendations on the major four following issues:

1. Timber

- a. There should be an effective monitoring and control systems on timber extraction, transportation, processing and export, i.e. chain of custody of timber utilization.
- b. Make an inventory of all wood processing and exporting companies and bring them under state (Hayantar) control and corresponding tax regime, i.e. bring private wood processing industry from illegal but evident status into legal controlled status.
- c. Make sure that part of legally and illegally processed timber income is returned back to reforestation and forest re-habilitation activities, Hayantar employees and local community members.
- d. Investigate timber processing industry in terms of its consistency with sustainable forest management practices and international agreements that the Armenian government is signatory to.
- e. Develop effective control on price setting and marketing of timber in terms of effective tax collection and contribution to the national economy.
- f. Introduce timber certification practices in Armenia.

2. Fuelwood

- a. Make delineation between poverty-driven illegal cuttings or dead wood collection for fuelwood which is necessary for survival (heating, cooking) in local communities and illegal fuelwood extraction for business.
- b. Investigate the possibilities of alternative energy sources (natural gas, electricity) introduction to forestry-dependent communities. Study the governmental subsidies' possibilities or other means to support local communities to switch to alternative energy sources.
- c. Establish effective control and monitoring system on fuelwood extraction and consumption. Delineate between survival fuelwood which is consumed in the local community, and fuelwood for business which is transported from forested area to other part of Armenia.
- d. Develop effective control on price setting and marketing of fuelwood in terms of effective tax collection for the national economy.

3. Forest Sector

- a. Establish a clear picture of all forest stakeholders, including their objectives, responsibilities and rights.
- b. Integrate all forest related projects and initiatives (both national and international ones) to support nation-wide objectives (e.g. effective monitoring and control of illegal activities, reforestation and afforestation activities).
- c. Create a vision of future forests by involvement of all relevant sides and stakeholders (both governmental, public, NGOs and academic establishments).
- d. Put special emphasis on forest education, training, science and material-technical bases.

4. Governance

- a. Adopt nationwide and nation-wise forest policy.
- b. Adopt new forest law on the basis of transparent discussions at different levels. Work out guidelines for implementation of forest policy and forest code general statements,
- c. Adopt National Forest Program.
- d. Create reliable information systems through GIS, remote sensing and information database management to monitor natural resources (including forestry) utilization.
- e. Create database for tracking legally and illegally cut logs.
- f. Implement Illegal Logging Action Plan.
- g. There should be organized independent monitoring association or unit, composed by local and international experts which will be tasked to conduct an objective study of the situation and provide solutions through: database use to produce corresponding systems, reduction of sawmills and the development of indicators to monitor illegal logging.

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CHECKLIST ON POVERTY DRIVEN ILLEGAL ACTIVITIES IN THE FOREST SECTOR

Statement	True/false	Comment
Almost all (more than 80%) of rural people depend on fuelwood for energy needs	F	
The majority (more than 50%) of rural people depend on fuelwood for energy needs	Y	Because of high prices on other energy sources
There is no feasible alternative energy source available for the rural people who depend on fuelwood, especially the poor	Y	Gas is very expensive
Almost all (more than (80%) of urban people depend on fuelwood (and/or charcoal) for energy needs	F	
The majority (more than 50%) of urban people depend on fuelwood (and/or charcoal) for energy needs	F	
There is no feasible alternative energy source available for the urban people who depend on fuelwood (and/or charcoal), especially the poor	F	
Almost all (more than (80%) fuelwood (and charcoal) production and trade is done outside of the formal economy/ without legal authorisation	Y	
The majority (more than 50%) of fuelwood (and charcoal) production and trade is done outside of the formal economy/ without legal authorisation	F/Y	This is rather difficult to judge as sometimes local authorities do support illegal fuelwood extraction for short term benefit
The legally extractable supply of fuelwood (and charcoal) is sufficient to meet the subsistence needs of rural and urban populations.	N	
Almost all (more than 80%) of wood used in local construction in the rural areas in harvested and transported without legal authorisation	Y	
Most (more than 50%) of wood used in local construction in the rural areas is harvested and transported without legal authorisation	Y	

CHECKLIST ON TRANSPARENCY OF TIMBER SALES

Statement	True/ false	Comment
<i>Awarding concessions/selling timber</i>		
Concessions are awarded/timber is sold predominantly through competitive bidding	F	
The public has notice and opportunity to bid before awards	F	
Several bids are presented as a rule in the bidding processes	F	
Bids are made public after awards	F	
Award rules are publicly available	F	
Unsuccessful bidders and other interested parties may challenge awards	F	
An independent internal government watchdog polices the process	F	
Forest officials must disclose financial interests in the forest sector (own and those of family members/close relatives)	Y	
<i>Timber harvesting and sales from valid concessions</i>		
Concession contracts, inventories and plans are publicly available	F	Not always and not on equal bases
Rules regarding forest practices concerning concession areas are publicly available	F	
Citizens may bring lawsuits or file administrative complaints to enforce concession requirements	F	
<i>Timber harvesting and sales from private forests</i>		
Forest officials have a procedure for controlling in the field timber harvesting and sales from private forests	N/A	
Rules regarding forest practices on private lands are publicly available and accessible to private forest owners	N/A	
<i>Transport of timber</i>		
Government officials have a procedure for controlling the transport of timber	Y	Yes, but control and monitoring is not effective due to lack of transportation, financial and other means
Government officials have a procedure for verifying the origin of timber being transported	Y	They can easily check as all felling are done according to cutting ticket issued by Hayantar himself
<i>Sales of confiscated timber</i>		
Records are kept on volumes and assortments of illegally procured or transported wood captured by officials	Y	(Illegal logging, 2004)
Captured wood is sold in public auctions or through other kinds of public bidding	F	
Records are kept on volumes confiscated and sold as well as on prices obtained	F/Y	There is very general statistics on this
<i>Processing of forest products</i>		
Law requires licensing or registration of commercial processing facilities	Y	
Government performs regular inspections of processors	Y	Yes, but not in an effective way due to lack of resources
<i>Export or import of forest products</i>		
Customs officials trained to recognize restricted/prohibited species	F	

Statement	True/ false	Comment
<i>Concealing revenue from forest activities</i>		
Forest revenue system (royalties, taxes etc.) establish a clear basis for monitoring revenue collection (volume or area based)	Y	
Records are kept on logging volumes and revenue collection by defined geographic areas	Y	They are kept in Forest Enterprises and later reported to Hayantar
Periodic audits are carried out to verify that revenue collected matches with logging volumes/ areas under production	Y	
<i>Civil services, social, and institutional factors that influence illegal activity</i>		
Forestry officials regularly trained to upgrade law enforcement skills	F	
Judges and prosecutors trained in forest sector issues	F	
Forest agency is subject to independent audits	F	
Civil service has ethical code-of-conduct (e.g. regarding acceptance of gifts and benefits)	F	
Ombudsman or other independent mechanism responds to public complaints	Y	

LIST OF STAKEHOLDERS

1	Hayantar- Ministry of Agriculture
2	Forest agency- Ministry of Agriculture
3	Bio-resources Management agency-Ministry of Nature Protection
4	Inspectorate - Ministry of Nature Protection
5	Reforestation and Forest Development Fund- Armenian Government
6	Greens' Union of Armenia (Non-governmental organization)
7	Armenian Tree Project (Public organization)
8	Armenian Agricultural Academy, Forestry Department
9	Forest private sector representative (SilGroup, MaxWood, Caritas, Yerevan Brandy Company)
10	World Bank

**HAYANTAR PRICE LISTS AND NATURE USE FEE TARIFFS
(Adopted from Min. of Nature Protection/SIDA 2004)**
Nature Use Fee Tariffs

This table is an extract from Government Decision N 864 of December 30, 1998. It is still current.

Species	Distance from forest (km)	Tariffs (in drams)			
		Timber under bark diameter near stump (cm)			Fuel wood over bark
		More than 25	13-24	3-12	
Beech	up to 10	3 640	3 220	2 800	700
	10-25	2 800	2 520	2 240	630
	25-40	2 520	2 240	1 680	560
	more than 40	2 240	1 960	1 680	420
Oak, ash	up to 10	3 920	3 640	2 800	700
	10-25	3 080	2 800	2 240	630
	25-40	2 520	2 240	1 680	560
	more than 40	1 960	1 680	1 400	420
Hornbeam, maple, elm	up to 10	1 260	1 120	840	700
	10-25	1 120	980	840	630
	25-40	980	840	700	560
	more than 40	840	700	420	120
Others	up to 10	980	840	700	420
	10-25	700	700	560	350
	25-40	560	560	420	280
	more than 40	420	420	260	210

Hayantar Price Lists

Minimal prices for giving out wood from RA forest fund starting from October 1 2001
(for 1 cubic meter, in thousand drams) without VAT

Forest species	Standing						Felled at stump						Roadside					
	Timber (3 meter long)						Timber (3 meter long)						Timber (3 meter long)					
	Diameter more than 25 cm		Diameter 13-25 cm		Diameter up to 12 cm	Technical wood (1 m long)	Diameter more than 25 cm		Diameter 13-25 cm		Diameter up to 12 cm	Technical wood (1 m long)	Diameter more than 25 cm		Diameter 13-25 cm		Diameter up to 12 cm	Technical wood (1 m long)
	type		type				type		type				Type		type			
I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	
Oak, ash, maple	28	26	25	23	18	16	30	28	27	25	20	18	38	36	35	33	28	26
Pine, lime-tree	23	21	20	18	13	11	25	23	22	20	15	13	33	31	30	28	23	21
Beech	20	18	17	15	12	10	22	20	19	17	14	12	30	28	27	25	22	20
Hornbeam and others	15	13	12	10	9	8	17	15	14	12	11	10	25	23	22	20	19	18

Fuelwood from logging, 1 meter long (stacked cubic meter)

Forest species	Standing	In the logging area	In the lower storage places
Oak, ash, maple	4.5	5	6.6
Pine, lime-tree	2.0	2.5	4.1
Beech	4.0	4.5	6.1
Hornbeam and others	4.0	4.5	6.1

*Logging operations are done by population only under forest enterprise direct supervision
The price for giving out fuelwood from waste should be set up as 50% of the price of standing.

**Groups of organizations:
the following coefficients should be used for different groups of enterprises**

<p><i>Group 1</i> <i>1.0</i></p> <p>Yerevan forest enterprise Armavir forest enterprise Gugark forest enterprise Ijevan forest enterprise Hrazdan forest enterprise Dilijan National Park Sevan National Park</p>	<p><i>Group 2</i> <i>0.9</i></p> <p>Jambarak forest enterprise Sevkar forest enterprise Dsegh forest enterprise Artsvaberd forest enterprise</p> <p><i>Group 3</i> <i>0.8</i></p> <p>Lalvar forest enterprise Stepanavan forest enterprise Jiliza forest enterprise Yeghegis forest enterprise</p>	<p><i>Group 4</i> <i>0.7</i></p> <p>Noyemberyan forest enterprise FREC State Closed Stock Company Aragatsotni forest enterprise Jermuk forest enterprise Gyumri forest enterprise</p> <p><i>Group 5</i> <i>0.6</i></p> <p>Meghri forest enterprise Kapan forest enterprise Goris forest enterprise Sisian forest enterprise</p>
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Minimal prices for giving out wood from RA forest fund starting from March 1 2004 (for 1 solid cubic meter, in thousand drams) without VAT

Forest species	Standing						Felled at stump						Roadside					
	Timber (3 meter long)				Diameter up to 12 cm	Technical wood (1m long)	Timber (3 meter long)				Diameter up to 12 cm	Technical wood (1m long)	Timber (3 meter long)				Diameter up to 12 cm	Technical wood (1m long)
	Diameter more than 25 cm		Diameter 13-25 cm				Diameter more than 25 cm		Diameter 13-25 cm				Diameter more than 25 cm		Diameter 13-25 cm			
	type		type				type		type				Type		type			
I	II	I	II	I	II	I	II	I	II	I	II	I	II					
Oak, ash, maple	84	78	75	69	54	48	90	84	81	75	60	54	114	108	105	99	84	78
Pine, lime-tree	46	42	40	36	36	22	50	46	44	40	30	26	66	62	60	56	46	42
Beech	40	36	34	30	30	20	44	40	38	34	28	24	60	56	54	50	44	40
Hornbeam and others	15	13	12	10	10	8	17	15	14	12	11	10	25	23	22	20	19	18

Fuelwood from logging, 1 meter long (stacked cubic meter)

Forest species	Standing	In the logging area	In the lower storage places
Oak, ash, maple	5.0	6.0	69.0
Pine, lime-tree	3.0	4.0	7.0
Beech	5.0	6.0	9.0
Hornbeam and others	5.0	3.0	9.0

*Logging operations are done by population only under forest enterprise direct supervision

Groups of organizations: The following coefficients should be used for different groups of enterprises

<p><i>Group 1</i> <i>1.0</i></p> <p>Yerevan forest enterprise Armavir forest enterprise Gugark forest enterprise Ijevan forest enterprise Hrazdan forest enterprise Dilijan National Park Sevan National Park</p>	<p><i>Group 2</i> <i>0.9</i></p> <p>Jambarak forest enterprise Sevkar forest enterprise Dsegh forest enterprise Artsvaberd forest enterprise</p> <p><i>Group 3</i> <i>0.8</i></p> <p>Lalvar forest enterprise Stepanavan forest enterprise Jiliza forest enterprise Yeghegis forest enterprise</p>	<p><i>Group 4</i> <i>0.7</i></p> <p>Noyemberyan forest enterprise FREC State Closed Stock Company Aragatsotni forest enterprise Jermuk forest enterprise Gyumri forest enterprise</p> <p><i>Group 5</i> <i>0.6</i></p> <p>Meghri forest enterprise Kapan forest enterprise Goris forest enterprise Sisian forest enterprise</p>
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