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# Forest Dependency in Rural Armenia

Anahit Mkrtchyan



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# 1. Introduction

## 1.1 Forests and forest use in Armenia

There is no consensus as to what constitutes the level of forest cover in Armenia. A 2010 FAO's Global Forest Resources Assessment (FAO, 2010) estimated forest cover at 262,000 hectares (ha) and earlier estimates suggest the figure may be considerably lower. According to "Hayantar" State Non Commercial Organization, the state forest agency in Armenia, forest cover in 2010 is 345,820 ha, which is about 11.2% of the total land area, which is the same as it was in 1993 (Hergnyan et al., 2007). In recent years, satellite imaging (Landsat images from Hergnyan et al., 2007) has suggested that the forest cover decreased from 334,100 ha in 1993 to 232,000 ha in 2006, i.e. it declined from 11.2% in 1993 to 7.7% in 2006 (Hergnyan et al., 2007). Whatever the figures are the fact remains that Armenia has extremely limited forest resources, making it particularly vulnerable to over-harvesting. Virtually all forest resources are located in Tavush and Lori regions (northeast) and Syunik region (south), with just 2% located in central Armenia.

Due to Armenia's topographical features, one third of its forest is located on steep terrain (approximately 80% of the country's terrain is mountainous) (Ter-Gazarian 1997, Junge & Fripp 2011). The variety of microclimates and soil types and sharp differences in elevation have determined Armenia's unique biodiversity and high floral endemism – 120 species (1.5% of Caucasus flora) are endemic to the country. Of the total forest area, about 70% is "high forest", 86% of which is oak - 120 thousand ha or 35.9% of the stock, beech makes up approximately 96.6 thousand ha or 28.9%, hornbeam makes up 55.1 thousand ha or 16.5% and pine 17.7 thousand ha or 5.3%. The remainder is coppice forests and shrub forests, which are poorly stocked and degraded (Ter-Gazarian 1997).

Armenia's mountain forests play a vital role in providing habitats for rare and endangered animal species. Armenia lies in the middle of the Caucasus Hotspot classified by Conservation International as one of the world's 35 'Biodiversity Hotspots' of the globe and forms the backbone of the East Lesser Caucasus Mountain chain, which serves as a critical wildlife corridor in the eco-region.

Distribution of forests in Armenia is uneven. The primary forested areas are in the north, northeast and south, while the central part of the country is almost treeless. Today, 62% of the forest cover is found in the north & northeast (Lori and Tavush), 36% in the southeast (Syunik), and only 2% in the central region of the country. (Ter-Gazarian 1997). The survey was conducted in Tavush, Lori and Syunik regions, where the concentration of forest is the highest and covers most of the territory.

Despite extremely limited stock, forests of Armenia provide important services for the local population and for the national economy. They procure timber and fuelwood for rural communities and for industrial purposes. However, communities rely on forest not only for fuelwood but also for Non-Timber Forest Products (berries, nuts, wild fruits, etc.) and benefit from environmental services the forest provides, such as the prevention of erosion and flooding. Forests protect the land from floods, erosion and keep the soil fertile, which is vital for agriculture, while forest catchments provide both fresh drinking and irrigation water for agricultural lands. Armenia's diminishing forest cover provides a wealth of economic, environmental, social and cultural benefits, many of which are vital to the fundamental wellbeing of the nation.

All forests in Armenia are state owned. Forest lands that are outside of the protected areas are managed by the Ministry of Agriculture of Armenia through "Hayantar" SNCO. "Hayantar" is the only state forest agency responsible for forest protection, reproduction, registration, inventory and use. The total area managed by "Hayantar" is 345,7 thousand ha, of which 277,1 thousand ha is forest cover. In 2005 the State Forest Monitoring Center operating under the Ministry of Nature Protection of Armenia was established to monitor overall activities of the forest sector, including illegal logging and other illegal activities. Responsibilities for these activities are split between the Ministry of Agriculture, to which "Hayantar" belongs, and the Ministry of Nature Protection, to which the State Forest Monitoring Center belongs. Some

dual responsibilities of both agencies and unclear mandates cause an overlapping of their functions as a result.

All forest lands falling within the network of protected areas in Armenia are managed exclusively by the Ministry of Nature Protection through the “Bioresources Management Agency” which was established for the provision of research, conservation, reproduction and sustainable use of landscape and biological diversity of natural ecosystems.

## 1.2 Rationale: The Importance of Forest Dependency Study in Armenia

Forests are one of important sources of firewood, foods (plant), medicines and a whole range of products and are obviously important as a means of generating cash income and particularly for the 'poor'. Many rural communities in Armenia depend on the forest resources, and in many cases this dependence is subsistence-level as the culture of market relations is not well developed in country. The recorded decline in forest resources partly results from overuse by «force keepers» of the province, village often due to industrial use or other factors, forest dependent communities often find themselves under attack. In this paper we also aim to - investigate the nature of relationships between people and forests and effectiveness of forest resource management in Armenia.

Armenia's limited forest stock offers fewer economic and environmental benefits. In combination with high levels of unemployment, unused lands and flourished corruption in all spheres of the society (forest is not an exception), it causes migration of local economically active population and aging of rural communities. The study on dependence of rural communities on forest - implemented by IUCN in Armenia in 2012, in 2013 and in 2014 showed that fuelwood is the primary source of energy for heating and cooking for rural forest dependent communities, irrespective of available gas infrastructure. This was also confirmed by the former socio-economic research (ICARE 2011) which revealed that this dependence on fuel wood will continue as long as the prices for gas increase year by year and the energy alternative sources (sun, wind) would be accessible for population.

Non-timber forest products are also very important because people are allowed to collect them freely and HH make storages for all winter.

The research of 2015-2016 helps to identify the economic benefit received from forests, understand factors that determine the welfare of the forest communities or limit their sustainability. It helps to record all types of income, measure the percentage of forest income in it, and understand the access to forest for different social strata.

The research findings, the new knowledge on population opinions and attitudes to current forest management and their right on forest use will be provided to different stakeholders: institutions and decision-makers in order to improve forest resource governance in the country and what is important to listen and hear the opinion of local community members and to involve them in decision making, implementation and monitoring.

This research is important not only at village level, but for the country as a whole. It could be a good basis for community and forestry province strategy development to:

- Face the negative effects of climatic change
- Promote training of villagers on harvesting practices and market-use
- Support poor households in the product sale (not only forest)
- Offer better access to product markets and prices, access to credit/capital, equipment/technology to harvest and process the product

Moreover, because this research is regional in its scale, it will help to compare the results of studies and situations with forests in different countries with different legislation, management and monitoring systems. Results of this study will complement and complete the research held in 2014 (covering 6 villages) by adding to this database the additional new 4 villages in forested regions of Lori, Tavush, Syunik and one more added village in Gegharkunik region located in the eastern part of the country with completely different natural, climatic conditions and the population.

In the end, data generated as a result of this study will be mapped and color-coded using the Geographic Information System tools in order to generate a user-friendly knowledge product.

## 2. Methodology

### 2.1 Study area

This Program specifically covers seven countries of the ENA Region, including six members of the European Neighborhood Policy Instrument (ENPI) – Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine, and the Russian Federation.

Selection of four forest-dependent communities (i.e. those adjacent to forest or living on the edge of the forest) allowed for a wide geographic coverage in Armenia with communities in the north, north-east, south and east of Armenia: Lori Region (North), Tavush Region (North East), Gegharkunik Region (East) and Syunik Region (South).

The goal of the study of the value of forest functions to local communities in Armenia by identifying their relationship with the natural resource base they depend on was met through a specifically designed methodology of qualitative and quantitative research. In particular, the study did the following:

- Documented factors and reasons that determine sustainability between communities and their forest base;
- Measured the values and benefits rural communities receive from the forest resources;
- Provided quantifiable information for decision makers in order to improve forest governance.

Areas targeted by the survey are shown on the map below:



**Map 1. Regions and targeted communities in Armenia**

## 2.2 Method of sampling

A total of four communities with different characteristics were chosen as study targets in the North, East and South of the country. Selection of communities was done in consensus with «Hayantar» SNCO.

The following rural communities were selected: Dsegh in Lori, Gandzakar in Tavush, Dprabak in Gegharkunik and Davit-Bek in Syunik regions.

For the purpose of research, villages have been selected based on the following criteria:

- Levels of poverty (*micro*) and economic development (*meso*)
- Infrastructure (North communities with gas supply, Central and South communities with no gas supply)
- Market distance
- Population density
- Migration patterns

**Table 1. Sampling criteria for each village**

Province	Village name	Sampling criteria
LORI	Dsegh	<ul style="list-style-type: none"> <li>❖ High population number - 2500</li> <li>❖ Officially medium level of migration</li> <li>❖ High level of poverty</li> <li>❖ Insufficient infrastructures               <ul style="list-style-type: none"> <li>- imperfect electricity system</li> <li>- imperfect running water system through pipes</li> <li>- partially gasified community</li> <li>- no irrigation system</li> </ul> </li> <li>❖ One usable road available for vehicle in all seasons</li> <li>❖ Long distance to the market - 32km</li> </ul>
TAVUSH	Gandzakar	<ul style="list-style-type: none"> <li>High population number – 3400</li> <li>Officially medium level of migration</li> <li>❖ High level of migration</li> <li>❖ Medium level of poverty (150 families are considered very poor)</li> <li>❖ Medium level of infrastructures               <ul style="list-style-type: none"> <li>- electricity</li> <li>- gas</li> <li>- running drinking water (pipes are in construction)</li> <li>- no irrigation system</li> </ul> </li> <li>❖ One usable road for vehicle in all seasons.</li> <li>❖ Short distance to the market 6.5 km</li> </ul>
GEGHARKUNIK	Dprabak	<ul style="list-style-type: none"> <li>❖ Low population number - 615</li> <li>❖ Medium level of migration</li> <li>❖ High level of poverty (40 families out of 217 HH are considered very poor)</li> <li>❖ Not perfect infrastructures:               <ul style="list-style-type: none"> <li>- electricity</li> <li>-not perfect drinking water system</li> <li>-no gas supply</li> <li>-no irrigation water pipe system and own pump station</li> </ul> </li> <li>❖ One usable road for vehicle in all seasons</li> <li>❖ Medium distance to market - 25 km</li> </ul>

SYUNIK	Davit-Bek	<ul style="list-style-type: none"> <li>❖ Low population number - 720</li> <li>❖ High level of migration</li> <li>❖ Medium level of poverty (22 families are considered very poor)</li> <li>❖ Infrastructures <ul style="list-style-type: none"> <li>- electricity</li> <li>- running water (through pipes),</li> <li>- irrigation water (through pipes)</li> <li>- no gas supply</li> </ul> </li> <li>❖ Medium distance to the market - 25 km</li> </ul>
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## 2.1 Number of Households

For the purpose of this study three methods of sociological research have been used: in-depth interview with Key informants (KI), household face-to-face interview (HH) and community meetings (CM).

**The Key informant interviews** were conducted with people who know what is going on in the community. The purpose was to collect information from a range of people—community leaders, principals of schools, other residents holding local authority, etc—who have firsthand official information about the community. These people with their particular understanding provided insight on the nature of problems in infrastructures, and supplied contacts to be approached in each community. One Key informant was chosen in each community, making a total of 4 Key informants.

**Community meetings (CM)** were organized with group participants based on their occupation (tiller, grazer, driver, military, constructor, teacher, student, medical worker, shop-owner, etc.), age and gender in each community. An average of 12 people was selected for each meeting. In all villages youth involvement was very passive making about 20%, because of their very small number (youth migration) in population of target villages.

**Table 2. The size of each meeting by gender distribution**

		Dsegh	Gandzakar	Dprabak	Davit-Bek
<b>Group size</b>		12	15	11	12
<b>Sex Composition</b>	Male	7	6	5	7
	Female	5	9	6	5

Community meeting discussions aim to reveal the Most Important Products (MIP) for each village in categories of «Fire-wood, charcoal, timber or other wood», «Food from Forest» and «Forage from the Forest», to identify «How has availability of the MIP changed over the past 5 years?» «What are the reasons of MIP decline?» «What would be most important to increase the use or income from the MIP?»

The community meetings were led according to the scenario of Forest Functionality Questionnaire, which record villager’s opinion on decline, increase of availability of the mentioned MIP, the sounded reasons of negative changes over the last 5 years and suggestions on how to increase the access and use of MIP in each village.

**The Household survey** was conducted using the Household Questionnaire common for all countries. It was completed using face-to-face interviews with one of the family members. The questionnaire contains several blocks:

1. Basic information on HH members (sex, age, education, occupation...)
2. Land and other assets

3. Forest resource base and environmental services
4. Forest and environmental income
5. Agriculture income and inputs
6. Livestock assets, income and inputs
7. Wage, Business and Other incomes

The questionnaire data was processed by computer Access program. Tables were analysed according to contract task.

## 2.2 Sampling of Households

A total of 80 households in selected communities have been interviewed according to specific criteria. 23 households were sampled in Lori region, 24 households in Tavush region, 15 households in Gegharkunik and 18 household were selected in Syunik regions.

The method of sampled households involved walking north and south on the main street from the starting point of the village square (which is considered the central point of the community). Every third household in the northern and southern direction of street was selected for the interview. The approximate proportion of poor (60%), middle (30%) and rich 10% families must have been kept.

**Table 3. The number and codes of sampled households**

Village name	No. of HHs	Code of village in database
Dsegh	23	1
Gandzakar	24	2
Dprabak	15	3
Davit-Bek	18	4

## 2.3 Timeline

Field surveys have been implemented during the period between 1 September 2015 and 4 October 2015. Site visits for community meetings and information update were made between 13 September 2015 and 13 October 2015.

**Table 4. The number of conducted household interviews in villages by dates**

Village	Date	Number of HH interviews
Dsegh	01/09/2015 - 12/09/2015	23
Gandsaqar	12/10/2015 - 23/10/2015	24
Dprabak	24/10/2015-30/10/2015	15
Davit-Bek	02/10/2015 – 04/10/2015	18
Total	01/09/2015 - 04/10/2015	80

**Table 5. The number of community meeting participants per villages by dates**

Village	Date	Number of members
Dsegh	13/09/2015	12
Gandsaqar	24/09/2015	15
Dprabak	01/10/2015	11
Davit-Bek	13/10/2015	12

## 2.4 Field implementation and problems encountered

The challenges identified during the previous study conducted in 2014 concerning methodology were discussed and fully considered by program authors.

During the 2015-2016 studies a few unforeseen technical challenges were faced:

- It was very difficult to involve youth in community meetings, because of small number of youth in total population of villages. Most of them migrated for seasonal work or study in universities of the capital.
- During the community meeting discussions women were more honest while sharing their opinion about reasons for fuelwood and fodder grass decline. Men were very passive, particularly in making suggestions because most of them or their friends were involved in logging (often illegal) activities. Women were very active discussing corruption in the sphere, mentioning monopoly in access of firewood areas and market in favor of a few.
- Our efforts and even changes applied to the questionnaire allowed to achieve trustworthiness of the real picture of fuelwood cash only partly.

## 2.5 Local unit conversion (incl. from key informant interview)

Armenian Dram (AMD), 1 USD equal to 470 AMD, Armenia -192.53

**Table 6. Unit conversion table**

	<b>Local unit name</b>	<b>Metric equivalent</b>	<b>Mean price per kg across the regions</b>	<b>Product</b>
1.	Truck/lorry	m3	5000-8000	Fuel wood
2.	Bucket	Kg	400-500	Blackberry
3.	Bucket	Kg	600-700	Strawberry
4.	Bucket	Kg	150 (wet), 500 (dry)	<i>Rosehip</i>
5.	Truck/lorry	Ton	10000-20000	Fodder grass
6.	Sack	Kg	100	Acorn
7.	Sack	Kg	200	Wheat
8.	Sack	Piece	50-80	Maize
9.	Sack	Kg	100-150	Potato
10.	Sack	Kg	600 (wet), 3000 (dry)	Walnut
11.	Sack	Kg	150-300	<i>Apple</i>
12.	Sack	Kg	100-200	<i>Plums</i>

### 3 Study area characteristics

Provided that Armenia is mainly forested in the north & northeast (Lori and Tavush = making up 62% of forest cover) and in the southeast (Syunik = making up 36% of the forest cover), Lori, Tavush, Gegharkunik and Syunik are the four administrative provinces in Armenia that were captured for the purpose of this study.

#### 3.1 Lori Region

The target village of the study Dsegh is located in Lori region with its administrative center in Vanadzor. The region is situated in the north of the country, bordering Georgia.



Map 2. Location of Lori in Armenia

Lori is a mountainous area. The highest point of the province has a height of 3196 meters a.s.l. with the lowest being 380 meters asl along the Debed River valley in the northeast of the region. Mountains are covered with thick forests.



Mountains in Lori Province covered with forest

Lori province spans 3,799 km<sup>2</sup> making up 12.7% of the country's territory. It is the third largest region by its territory and the second largest region by its population number after Yerevan city. Armenia's general railway connecting Yerevan and Tbilisi runs through the province.

The State Forest Fund of Lori region is 101,205 hectares, of which 85,799 hectares are forests: the state forest fund makes up 27% of the region. Forests in Lori are mountainous and have protection, water- and climate-control importance.

Lori is considered Armenia's greenest area, with more native forest land than any other region of the country. It is home to some of Armenia's most beautiful locations, set into the country's remaining old-growth forests and wilderness areas.

**Demographics.** Lori consists of 113 communities, of which 8 are considered urban and 105 rural. The density of the population in the region is 62 persons per square km.

According to National statistical service of Armenia Lori has a population of 235,537 (111,675 men and 123,862 women), forming around 7.8% of the entire population of Armenia.

The urban population is 137,784 (58.5%) and the rural is 97,753 (41.5%). (Official website of Lori region: <http://lori.gov.am>)

**Economic data (major economic activities).** The leading branches of economy of the region are agriculture and industry, especially metallurgy industry and food production. In rural regions population is involved in agriculture, livestock and forestry activities.

Agriculture is one of the main economic sectors in the region. Based on official statistics, total agricultural land in Lori region is 251,154 hectares, including 42,075 hectares of arable land, 2,654 hectares of perennial plants, 35,155.8 hectares of hay land and 145,714.1 hectares of grazing areas and other lands totally 27,791.7 hectares. However, agriculture production is fairly low, compared to other regions. In this 2013 picture of gross agricultural output per regions, Lori ranks 6th (see AGRICULTURE IN ARMENIA SNAPSHOT. Avenue consulting group, Yerevan 2014, p. 3), which is around 7.5% of the annual total agricultural product of Armenia. Approximately 40% of the population in Lori is involved in agricultural activities, including farming and cattle-breeding. Almost 66.3% (2,511.5 km<sup>2</sup>) of the total area of the province are [arable lands](#), out of which 17% (421 km<sup>2</sup>) are ploughed. The main crops of the region are grains, followed by potato and vegetables.

Animal husbandry. The main livestock production in Lori is cattle and pigs. On the national list of livestock products per Marzes (regions) in 2013, under Livestock and poultry sold for slaughter (in live weight), Lori ranks the second with 16.3 thousand tons of total production, 81.3 tons of milk and is the 6th in egg production 43.7 million pieces (See AGRICULTURE IN ARMENIA SNAPSHOT. Avenue consulting group, Yerevan 2014, p. 3).

### 3.1.1 Dsegh Community

Dsegh Community is one of the biggest community in province famous for its history and culture. It was founded during the ancient times Before Christ (B.C). The village is 32km away from the administrative center of the region. The elevation is 1250-1350 above sea level. It is surrounded with high mountains covered with thick forests and is rich in small beautiful lakes.



Dsegh



Lake Tsover in Dsegh

The village hosts a secondary school with 50 teachers and a modern hospital built by the Red Cross. Over the past 12 months its community was involved in different International Community Development Programs and benefited directly from forest services (“Biodiversity conservation”). The poster in the central square of Dsegh highlights the community’s active cooperation with international donor organizations such as the World Bank, WWF Armenia, IUCN and EU within the frames of the ENPI FLEG Program. The head of the community (key informant) has ignored this fact.



Poster in Dsegh village square

### a. Demographics

The population number in the village is 2500. Officially it has a medium level of migration and a high level of poverty. 96 households benefit from state allowance for poverty or disability.

### b. Infrastructure availability

The data collected in September of 2015 in Dsegh revealed that the infrastructure in the community is far from perfect which makes the everyday life of villagers very difficult. There is only one road used by vehicles in all seasons. The village has an electricity connection, but its infrastructure is not in a perfect state, frequent disconnections are common. The running water through pipes is available only to 60% of households and only for a few hours daily. The village has no water gauge system and many households use drinking water to irrigate lands. Installation of gas pipelines does not cover the whole territory of the community.

### c. Economic data. Major economic activities

The population of Dsegh is involved in agriculture, livestock farming and collection of forest products.

Typical daily wage for an unskilled/seasonal agricultural job for men in high /low season during the last year (12 months) ranges between 2,000 – 1,500 Armenian drams and 1,500 – 1,000 Armenian drams for adult women in high/low season. However, the average wage of skilled professionals is 5,500 AMD. In this community the «forest logger», «policeman», «contractor» and «mechanic» are the most profitable jobs (10,000-16,000 AMD daily).

Year-round full-time occupation is available only for «government employees» and «constructors» in the village. In the total incomes of villagers the «Wage income» is essential – 35.5%.

The main staple (principal product) in the community is fuelwood, with a price per m<sup>3</sup> ranging between 5,000-8,000 AMD (during the past 12 months). The village has a sawmill.

The main forest products in Dsegh are fuelwood, blackberry, fodder grass, acorn and mushroom. The main agricultural products are wheat, maize, potato, and nut.

**Table 7. The lowest/highest price for products**

Local Unit name	English equivalent	Metric equivalent	Price for local unit	Product
Դրամ	Armenian Dram	m <sup>3</sup>	5000-8000	Fuelwood
Դրամ	Armenian Dram	Kg	400-500	Blackberry
Դրամ	Armenian Dram	Kg	600-700	Strawberry
Դրամ	Armenian Dram	Ton	10000-20000	Fodder grass
Դրամ	Armenian Dram	Piece	50-80	Maize
Դրամ	Armenian Dram	Kg	100-150	Potato



Dsegh Village. Boys carrying heavy corn bags.

In Dsegh several months are the most important for collection of forest and environmental products, as well as for harvest, sale and planting of main agricultural products.

#### d. Seasonal calendar

Table 8. Major activities in Dsegh by month. (H stands for harvest, S stands for sale and P for planting)

Product Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fuelwood	H/S	H/S	H/S						H/S	H/S	H/S	H/S
Blackberry								H/S	H/S			
Raspberry				H/S	H/S							
Fodder grass/acorn	S	S	S	S	S	H/S						
Potato	S	S	S	P	P			H/S	H/S	H/S	S	S
Maize				P				H/S	H/S	H/S	H/S	



Making of dried fruit in Dsegh

### e. Major markets and market access

The main market place is located 32 km away from the village. The distance from the village to the markets for major consumption goods, for agricultural products and non-timber forest products is 32 km which 45 minutes drive by car. It was mentioned that the market where timber products are sold is 155 km far from the village (180 minutes by car).

The general livestock products in the village are meat, milk, egg, wool, honey.

Many villagers are engaged in cottage manufacturing and selling of chairs to neighboring villages. The main material for processing is beech (*Fagus* sp.), which in villagers' opinion is completely logged in the surrounding forest. They have to buy the material for chairs from the far away timber market.

### f. Major land cover and land uses

Major land cover and land use accounts for 39.47 km<sup>2</sup>. The information received from the key informant and collected during the household survey revealed that all households have land asset inherited after the privatization of former Soviet *kolkhoz* collective farms. In Dsegh the average size of each household land is 1.3 ha. 26% of lands are not used by owners as 83.5% of survey respondents do not see it as a profitable business, 16.5% cannot pay for irrigation and fertilizers. It is quite reasonable that the agricultural income in this community makes up only 19% from total income. The sale value for one hectare of good agricultural land (not degraded, not very steep) fit for production of common crops and accessible within 1 km from the main road or a land parcel in Dsegh is very low, ranging between 130,000 – 220,000 AMD.

### g. Description of conservation areas

There are no officially designated protected areas in the village. However, the village is known to form part of Dsegh Important Bird and Biodiversity Area (IBA), one of the most biologically diverse regions in Armenia designated by BirdLife International as a place of international significance for the conservation of birds and other biodiversity. A Nature Visitor Center has been established in the village and is operated by the Armenian Society for the Protection of Birds NGO, the national partner for BirdLife.

### **h. Tenure and governance**

All forest resources of the community belong to the state and are managed by the Ministry of Agriculture of Armenia through its state forest agency “HAYANTAR” SNCO. Use of water resources is permitted by Water Resource Management Agency under the RA Ministry of Nature Protection, other natural resources managed by the RA Ministry of Energy and Natural Resources.

### **i. Government and other development/conservation projects**

Major government programs in the area are currently aimed at developing tourism infrastructure in the village, both with the efforts of local and national NGOs and the governor of the province.

Recently, the government passed a Decree on «Free Provision of Deadwood to Forest-dependent Communities» which allows forest communities to collect up to 8 m<sup>3</sup> of fallen wood per household per year.

### **j. Calamities**

No significant calamities that may affect the data have been observed.

## **3.2 Tavush Region**

The study target village **Gandzakar** is located in Tavush region with its administrative center in Ijevan. The region is situated in the north east of the country, bordering Georgia.



**Map 3. Location of Tavush in Armenia**

Tavush has an area of 2,704 km<sup>2</sup>, which is 9% of total area of Armenia. The territory is mainly mountainous and rocky hillsides covered with green carpets of alpine meadow vegetation. The average elevation of the region is around 900 meters above sea level.

The province entirely lies among the mountains of Lesser Caucasus. The highest point of Tavush is the Miapor peak with a height of 2993 meters, while the lowest point is located at a height of 380 meters in the

Devbed river valley. The province is a major source of water in Armenia. It is also rich in its mountain springs, mineral water and small lakes Parz and Gosh.

Tavush is part of Armenia's green belt with the second largest forest expanses in the country. 51% of the region's overall area of the province is occupied with mixed forests, remarkable for the diversity of their flora and fauna.

**Demographics.** Tavush is the second least populated province in Armenia. According to 2011 official census, Tavush has a population of 128,609 (62,083 men and 66,526 women), forming around 4.3% of the entire population of Armenia. The urban population is 54,186 (42.1%) and the rural - 74,423 (57.9%). The province has 5 urban (with 52,600 population ) and 55 rural communities. Economically active population of the province comprises 53,500 people. The migration of young families and very low birth rate year by year is increasing proportion of the elderly.

**Economic data.** Major economic activities Tavush's economy is based on agriculture, seasonal cultural and eco-tourism. The most pronounced sectors of economy in the province is agriculture and processing industry. The latter is particularly prominent with stone and timber processing, wine and mineral water production. The leading branches of economy of the region are agriculture and food production. Tavush is famous for its grape production (official website of Tavush Province: <http://tavush.gov.am>). Population is involved in agriculture, livestock and forestry activities.

**Agriculture.** Total agricultural land in Tavush is estimated to be 270,393 hectares, of which 41% (1,108 km<sup>2</sup>) of the total area of the province are arable lands, out of which 23% (256 km<sup>2</sup>) are ploughed. Average villager owns 1.46 hectares of plot, and 96% of farms are less than 3 hectares. The region's agriculture is suffering from unstable ceasefire with neighboring Azerbaijan as 43 out of 62 communities are caught in indiscriminate gunfire or shelling. More than 9,000 hectares of orchards and fields remain uncultivated. The main crops are grains and grapes.

Gross analysis of agricultural output per provinces of Armenia in 2013 show that the agricultural index for Tavush is poor and makes up only 4.8%. The total annual agricultural product in province is 43.7 billion AMD (see AGRICULTURE IN ARMENIA SNAPSHOT, Avenue consulting group, Yerevan 2014, p. 3).

**Animal husbandry.** The population in rural communities is mainly involved in crop production, cattle and pig farming. Recently, bee-keeping farms also opened in many communities. Tavush has the lowest in the country livestock and poultry production sold for slaughter (in live weight) - only 8.8 thousand tons. The situation to some extent is perfect concerning the production of milk (39.5 tones) and eggs (41.7million pieces) (see National statistical service of Armenia). However the poor diversity of produce is characterized by low levels of agricultural productivity, due to poorly developed markets, the poor state of rural infrastructure (irrigation and rural roads).

### 3.2.1 Gandzakar Community

Gandzakar is one of the biggest communities in Tavush region. The village was founded in 1860s and the first school was established in 1896. The village area is 33.7km<sup>2</sup>. It is located at 6,5 km from the region's administrative center.

The elevation above sea level of the village is 850m. It is situated in climatically temperate zone and has summer averages of + 20°C and -1°C in winter.

The modern village hosts a school with 461 pupils, an ambulatory clinic, a kindergarten and community center.



Entry point to Gandzakar

### a. Demographics

It has a population of 3,531-3,400 and 1,222 households (as of 1 January 2015). The officially recorded migration rate is 11%. Pensioners make up approximately half of the village population - 600. 150 depend on state allowance of poverty or disability.

### b. Infrastructure availability

The data collected in October 2015, revealed that Gandzakar has one available road used by vehicles in all seasons. The community has access to electricity and gas, partly running drinking water (pipes are under construction), but lack irrigation system.

As mentioned by the key informant, over the past 12 months direct benefits related to forest service received by the village (as a community or individuals) from the government made only 80,000 AMD. The community received an external support (compensation) of 11,750,000 AMD from the timber company and from NGO/ development organization.

### c. Economic data. Major economic activities

The population of Gandzakar is involved in agriculture, livestock farming and collection of non timber forest products. In pre transition period the traditional agricultural industry for Gandzakar were tobacco and grapes, which were destroyed during 1990s. From that point onward, the villagers switched to animal husbandry. However it is less profitable as they began to gradually lose their free pastures which local government started privatizing.

Typical daily wage for an unskilled/seasonal agricultural job for men in high /low season over the last year (12 months) ranges between 10,000 AMD – 6,000 AMD and 6,000 AMD – 3,000 AMD for women (adult) in high/low season.

For a skilled professional job where only men are involved the daily wage ranges between 11,000 – 24,000 AMD. Jobs of ‘forest loggers’, ‘constructors’, ‘policemen’ are more highly paid in the village.

The main staple (principal product)\* in the community is fuelwood, the lowest/highest price per m<sup>3</sup> for which during the past 12 months varied between 7,000 AMD – 14,000AMD.

**Table 9. The lowest/highest prices for products**

Local Unit name	English equivalent	Metric Equivalent	Price for local unit	Product
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Դրամ	Dram	Kg	7000-14000	<b>Fuelwood</b>
Դրամ	Dram	kg	300-400	<b>Blackberry</b>
Դրամ	Dram	kg	500	<b>Strawberry</b>
Դրամ	Dram	kg	100	<b>Acorn</b>
Դրամ	Dram	kg	500-700	<b>Mushroom</b>
Դրամ	Dram	kg	200	<b>Wheat</b>
Դրամ	Dram	piece	5-70	<b>Maize</b>
Դրամ	Dram	kg	700 (wet), 2000 (dry)	<b>Hazelnut</b>
Դրամ	Dram	kg	600 (wet), 3000 (dry)	<b>Walnut</b>



Walnut drying in a villager's garage

#### d. Major markets and market access

The distance from the village center to the nearest «district market for major consumption goods», the «market where agricultural products are sold», and the «market where non-timber forest products are sold» is short making up only 6.5 km or nearly 15 minutes drive by vehicle and 30 minutes drive by public bus. The ‘market where timber products are sold’ is 140 km away from the village, which is possible to reach by car in 120 minutes.

#### e. Seasonal calendar

**Table 10. Major activities in Gandzakar by month (H stands for harvest, S stands for sale and P for planting)**

Product Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Fuelwood</b>	H/S	H/S	H/S	H/S			H/S	H/S	H/S	H/S	H/S	H/S
<b>Blackberry</b>	S	S	S	S	S	S	S	H	H	H	S	S
<b>Acorn</b>	S	S						H/S	H/S	H/S	S	S
<b>Mushroom</b>	S	S	S	H/S	H/S	H/S	H/S	S	S	S	S	S
<b>Wheat</b>	S	S	S	P	P	H	H	S	S	S	S	S

<b>Maize</b>	S	S	P	P	P	H	H/S	H/S	H/S	S	S	S
<b>Hazelnut</b>	S	S	S	S				H/S	H/S	H/S	H/S	H/S
<b>Walnut</b>	S	S	S	S				H/S	H/S	H/S	H/S	H/S



Household backyard in Gargar

### e. Major land cover and land uses

In Gandzakhar 1,038.72 ha out of 12,906.13 ha are pastures and 955 ha is arable lands. The average volume of land assets per household is 3.3 hectares. 54% of household land property is not cultivated and as explained by respondents because of the high cost for irrigation water and fertilizers (61.5%). Part of arable lands is not either because of lack irrigation system (through pipes). 46.0% of respondents explain that the land is too far from their house and 38.5% mention the lack of labor hands in the family (youth has migrated).

The sale value of one hectare of good agricultural land in the community (not degraded, not very steep) and fit for growing common crops and accessible within 1 km from the main road or town is 450,000 – 1,000,000AMD.

### f. Description of conservation areas

There is a number of protected forests which form part of Dilijan National Park, Akhnabad Yew (*Taxus baccata*) Grove Sanctuary, Arjatkhelni Hazel Sanctuary, Gandzakhar Sanctuary, Ijevan Sanctuary and Zikatar Sanctuary. Dilijan National Park is one of unique corners of Armenian nature and was established for the protection of beech and Caucasian mesophilic oak forests as well as a unique Yew Grove. Forests cover 94% of the park territory. This technically prevents the forest from logging, but high levels of unemployment, poverty and corruption in the region do not spare even the protected areas.

### g. Tenure and governance

All forest resources of the community belong to the state and are managed by the Ministry of Agriculture of Armenia through its state forest agency “HAYANTAR” SNCO. Use of water resources is permitted by Water Resource Management Agency under the RA Ministry of Nature Protection, other natural resources managed by the RA Ministry of Energy and Natural Resources.

### h. Government and other development/conservation projects

No major government programs are known in the community area.

Recently, the government passed a Decree on «Free Provision of Deadwood to Forest-dependent Communities» which allows forest communities to collect from forest up to 8 m<sup>3</sup> firewood per household per year.

### **i. Calamities**

No significant calamities that may affect the data have been observed.

## **3.3 Gegharkunik Region**

The next target village Dprabak is located in Ggharkunik region with its administrative center in Gavar town. The province is located in the East of the country.



**Map 4. Location of Gegharkunik in Armenia**

Gegharkunik is the largest region in Armenia with an area of 5,348 km<sup>2</sup> (18% of total area of Armenia). Approximately 1,278 km<sup>2</sup> of its territory is occupied by Lake Sevan, the largest lake in the Caucasus. Gegharkunik has a mountainous landscape with extensive mountain ranges of Gegham, Vardenis, Miapor and Kenats and the elevations ranging between 2,500 and 3,500 meters. The highest point of the region is Mount Azhdahak of Gegham mountains with its peak of 3,597 meters. The climate of Gegharkunik is cold and snowy in winter, while summers are characterized by warm and humid climate. Chambarak village in the borderline section of Gegharkunik region was our target for study. It differs from other parts of Gegharkunik both in its natural conditions and population. It is surrounded by natural meadows and forests rich in species diversity. However, its wild collection of many species diversity is being damaged and eradicated, thus reducing and isolating the natural surface which hinders regeneration. In 1990s the forests of Armenia suffered a lot due to the energy crisis. In order to survive the cold winters the local communities began to cut down trees to use them as firewood. As a result of mass loggings in a typical alpine area of Chambarak, especially on steep forested slopes, the area faced the problem of landslides as a dominant erosion process. Nowadays, this mountain slope and its extending area is exposed to water and wind erosion. Moreover, this area is used for cattle grazing and haymaking, which further deteriorates the problem. Illegal logging in the forests of neighbouring communities continues. See <http://www.armeniandiaspora.com/>



Alpine meadows and forests in Chambarak

**Demographics.** According to the 2011 official census, Gegharkunik has a population of 235,075 (119,180 men and 115,895 women), making up approximately 7.8% of the entire population of Armenia. The urban population is 71,423 (30.4%) and the rural is 163,652 (69.6%). The province has 5 urban and 87 rural communities. Chambarak population primarily consists of socially vulnerable resettled people and families of deceased soldiers, which is a direct outcome of the 1990s armed conflict with the neighbouring country.

**Economic data. Major economic activities.** The economy of Gegharkunik region has a predominantly agricultural orientation. It has a share of 18% in the annual total agricultural product of Armenia. Around 65% (3,487 km<sup>2</sup>) of the total area of the province are arable lands, out of which 27.3% (951.5 km<sup>2</sup>) are ploughed.<sup>[4]</sup> Around 60,000 farms in Gegharkunik are operated by the private sector. The main crops are potato and grains. Fishing and fish farming is also dominant in the province. Recently, beekeeping has significantly developed. Livestock and poultry sold for slaughter (in live weight) constitute 23.5 thousand tons, milk being 58.2 tons, eggs produced make up 120.7 million pieces. (See AGRICULTURE IN ARMENIA SNAPSHOT. Avenue consulting group, Yerevan 2014, p. 3).



Cattle-grazing near Lake Sevan

The majority of the population of Chambarak is engaged in animal husbandry and in collection of forest products. Poverty and vulnerability are dire in remote rural areas inhabited with refugees. They still face great problems in the area of their economic and social rights, suffering, in particular, from the lack of adequate housing and limited economic opportunities. See

[https://www.sgp.undp.org/index.php?option=com\\_sgpprojects&view=projectdetail&id=17766&Itemid=205](https://www.sgp.undp.org/index.php?option=com_sgpprojects&view=projectdetail&id=17766&Itemid=205)

### 3.3.1 Dprabak Community

Village Dprabak was founded in 1778 near the national historical monuments dating back to XII-XIII centuries. The administrative territory of the village is 22.85 km<sup>2</sup>. It spreads along the length of the river Getik and is situated at 1,200 meters above sea-level. The climate in winter is mild, but hot in summer. The community is 120 km away far from the region's administrative center. The Dilijan-Chambarak highway passes through the village. There is a secondary school in the community hosting 155 pupils.



Entry point to village Dprabak



Rainy morning in Dprabak

#### a. Demographics

Population of Dprabak is 615. In 1988 village was settled by people who were forcibly displaced by the neighboring country as ethnic Armenians. 40 from 270 households depend on state allowance and 80 households are single elderly families.

#### b. Infrastructure availability

The data collected during the course of the study in October 2015 reveal only one road used by cars in all seasons. The community is secured with electricity, but has no access to gas. The running water through pipes does not reach all households. The most important problem of the village is the lack of irrigation water pipe system and own pump station. Many householders use drinking water to irrigate their land parcels. Over the past 12 months direct benefits related to forest service received by the village (as a community or individuals) as forestry-related external support from NGO/ development organization made up 3,000,000 AMD.

#### c. Economic data. Major economic activities

The population of Dprabak is involved in agriculture, livestock farming and collection of forest products. The needs assessment shows very low indicators of economic and social development. The assessors connect it with low level of former refugees integration, as most of them have fled from urban areas and have no experience in agriculture. Only 20% of agricultural land is currently used in Dprabak, the rest (arable land) is used as pastures. ( See [https://www.sgp.undp.org/index.php?option=com\\_sgpprojects&view=projectdetail&id=17766&Itemid=205](https://www.sgp.undp.org/index.php?option=com_sgpprojects&view=projectdetail&id=17766&Itemid=205) ).

During the last year the typical wage for an unskilled/seasonal agricultural job for (adult) men ranged from 5,000AMD to 3,000AMD, and between 2,000 AMD -1,000 AMD for women. Better paid jobs include those of military servants, forest loggers and a school teacher ranging on average between 5,000-6,000 AMD and the number of their work days during the last 12 months has been more than 250.

The main forest and agricultural products in the community are fuelwood, fodder grass, acorn, rosehip and pear. The main important forest product in Dprabak is fuelwood available at 7,000 – 13,000 AMD per 1m<sup>3</sup>.



Family business in Dprabak

**Table 11. The lowest/highest prices for products**

Local Unit name	English equivalent	Metric Equivalent	Price for local unit	Product
Դրամ	Dram	M3	<b>7000-13000</b>	Fuel wood
Դրամ	Dram	Tons	20000-25000	Foddergrass
Դրամ	Dram	Kg	100	Acorn
Դրամ	Dram	Kg	150 (wet), 500 (dry)	<i>Rosehip</i>
Դրամ	Dram	Kg	200-500	<i>Pear</i>
Դրամ	Dram	Kg	150-250	<i>Potato</i>
Դրամ	Dram	Kg	150-300	<i>Apple</i>
Դրամ	Dram	Kg	100-200	<i>Plums</i>

#### d. Seasonal calendar

**Table 12. Major activities in Dprabak by month (H stands for harvest, S stands for sale and P for planting)**

Product name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Fuelwood</b>	H/S											
<b>Acorn</b>	S	S					H/S	H/S	H/S	H/S	S	S
<b>Foddergrass</b>	S	S	S	P	P	H/S	H/S	H/S	H/S	S	S	S
<b>Pear</b>	S	S	S	S				H/S	H/S	H/S	H/S	S

<b>Rosehip</b>	S	S	S					H/S	H/S	H/S	S	S
<b>Potato</b>	S			P	P			H/S	H/S	H/S	S	S
<b>Plum</b>								H/S	H/S	H/S		
<b>Bean</b>	S	S	S	P		H/S	H/S	H/S	H/S	S	S	S

### e. Major markets and market access

The distance from the village center to the nearest «market for major consumption goods», «market where agricultural products are sold», « market where non-timber forest products are sold», «market where timber products are sold» is 25 km and is 25minutes drive by car.

### f. Major land cover and land uses

The administrative territory of Dprabak village is 22.85 km<sup>2</sup>. Each household owns approximately 2.2 ha of land. The local population is engaged in livestock farming and vegetable crop production. Only 20% of agricultural land of the village is currently used, the rest (arable land) is used as pastures. ( See [https://www.sgp.undp.org/index.php?option=com\\_sgpprojects&view=projectdetail&id=17766&Itemid=205](https://www.sgp.undp.org/index.php?option=com_sgpprojects&view=projectdetail&id=17766&Itemid=205)) /.

In 2010-2012 «Shen» Charitable NGO initiated sustainable land-use and biodiversity conservation projects in the community. 4 ha of organic orchard with 1,350 trees of apple, pear and walnut and an education center for young gardeners have been established in Dprabak. The projects had gender focus because women comprised ca. 50% of all project participants. The income from the community orchard is intended for use to solve general community problems, apply new techniques and knowledge on their own land plots and increase the potential of their farms  
([https://www.sgp.undp.org/index.php?option=com\\_sgpprojects&view=projectdetail&id=17766&Itemid=205](https://www.sgp.undp.org/index.php?option=com_sgpprojects&view=projectdetail&id=17766&Itemid=205)). Yet, in 2015 the village was very poor and local population remained alienated from any plans.

Any information on the sale value of one hectare of good agricultural land in the community (not degraded, not very steep), fit for common crops production and accessible within 1km from the main road or town was not available, as key informant and community members had no such knowledge.

### g. Description of conservation areas

The forests surrounding the community are not included i any specially protected area.

### h. Tenure and governance

All forest resources of the community belong to the state and are managed by the Ministry of Agriculture of Armenia through its state forest agency «Hayantar» SNCO. Use of water resources is permitted by Water Resource Management Agency under the RA Ministry of Nature Protection, other natural resources managed by the RA Ministry of Energy and Natural Resources.

### i. Government and other development/conservation projects

In terms of development programs, Dprabak community, like other neighboring communities in the region, is outside of government's attention. Some initiatives were undertaken by local NGOs, such as «Cross of Armenian Unity» which tries to attract tourists in Dprabak visiting area and promote local services and attractions. The project was funded by World Vision Armenia and Armenia Caritas, and supported by the municipality of Dprabak.

Recently, the government passed a Decree on «Free Provision of Deadwood to Forest-dependent Communities» which allows forest communities to collect up to 8 m<sup>3</sup> of fallen wood per household per year.

### j. Calamities

No significant calamities that may affect the data have been observed.

### 3.4 Syunik Region

Davit Bek community is located in Syunik region with its administrative center in Gavar. The region is located in the south of the country.



Map 5. Location of Syunik in Armenia

Syunik province covers an area of 4,506 km<sup>2</sup> (15% of total area of Armenia), making it the second-largest province in Armenia after Gegharkunik in terms of the total area. Syunik is a mountainous region, mainly covered with thick green forests. The Zangezur Mountains occupy most of the territories of Syunik. Mount Kaputjugh with a height of 3,905 meters and Mount Gazanasar with a height of 3,829 meters are the highest peaks of the province.

Major water basins include the rivers of Vorotan, Voghji, Sisian, Meghri and Vachagan. Summer temperatures can reach up to 40°C, although the average temperature is around 22 °C, while in winter it may drop down to -12.5°C.



Forest covered mountains in Syunik

**Demographics.** According to the 2011 official census, Syunik has a population of 141,771 (69,836 men and 71,935 women), forming around 4.7% of the entire population of Armenia. The urban population is 95,170 (67.13%) and the rural is 46,601 (32.87%). The average density of the population is 34 persons per square km. The province has 7 urban and 102 rural communities. The province includes 109 communities of which 7 considered urban and 102 rural.

**Economic data. Major economic activities.** Syunik is Armenia's richest region in minerals such as copper, molybdenum, zinc, and lead as well as precious metals (gold, silver) and nonmetal minerals and historically was one of the most industrially developed areas. This legacy continues to keep the region in strong dependency on industry (especially mining industry) making it the dominant sector of economy. Nearly 40 mines are currently operating in the region, with 7 being metal mines and 32 non-metal. Syunik is home to many of Armenia's largest mining operations and largest tailing dams.

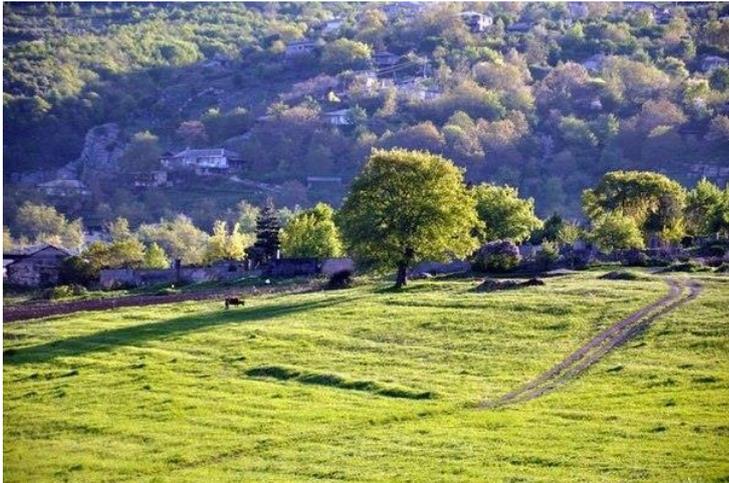
The industrial output of Syunik region is high and has produced the products reaching 45,669.800 million Armenian drams in 2014 (16,6% of country's economy). However, such high industrial output of the region does not work towards reduction of the poverty level, because most of the industrial businesses belong to a handful of government-linked individuals holding a monopoly over the basic commodities.

Being one of the largest economic regions of the country, Syunik at the same time is one of the least inhabited (and economically developed) regions. Holding the largest share of agricultural areas in Armenia (335,100 ha, including 43,800 of arable land) (Armstat), it has small number of rural population to properly cultivate the land. The long distances between districts and from the capital, hard and undeveloped rural roads, the lack of alternative transport, the highest in the country levels of unemployment and poverty (14.9 %) and marvelous nature with thick forest cover are characteristics of Syunik.

**Agriculture** is mainly specialized in crop production (in particular, cereals and potatoes) and animal husbandry (in particular, cattle breeding). As of 2014, products grown in the province included cereals (5704.5 ha), potato (1236.8 ha), vegetables (226.4 ha) and forage crops (413 ha). (See Official website of Syunik municipality: <http://www.syunik.gov.am>). Around 74% (3,336 km<sup>2</sup>) of the total area of the province are arable lands, out of which 13.2% (440 km<sup>2</sup>) are ploughed. By gross agricultural output, Syunik ranked 6<sup>th</sup> in 2013 generating 62.3 billion Armenian drams. For livestock and poultry sold for slaughter (in live weight) it is 7<sup>th</sup> - 13.9 thousand tons, 62.2 tons for milk and 26.3 million for eggs. (See AGRICULTURE IN ARMENIA SNAPSHOT. Avenue consulting group, Yerevan 2014, p. 3).

### 3.4.1 Davit Bek Community

Our target village Davit Bek was founded in 18 century by an Armenian historical hero Davit Bek. Throughout the history and up to the present days the villagers have protected their territory and courageously prevented any invasion of enemies. The village is 25km away from the administrative center of the region. It is situated at 1,100 m above sea level and has the territory of 23.1km<sup>2</sup>.



View of Davit-Bek village

### a. Demographics

The population of Davit Bek community is estimated at 720- 809 people. Seasonal migration of young men is very high. The youth flees to cities or leaves the country at all. The level of marriage and the total fertility rate is very low. The balance between fertility and mortality is 7-20.

### b. Infrastructure availability

According to information collected by our research group in November 2015 the village has one road useable by cars in all seasons. The community is secured with electricity, running and irrigation water (through pipes). It has no gas supply.

The key informant assured that the village (as a community or individuals in the village) has not received any direct benefits (in kind or in cash) related to forest services over the past 12 months.

### c. Economic data. Major economic activities

The main direction of economic activity in Davit-Bek community is livestock farming, field-crop cultivation and processing of forest products. A total of 262 households are involved in agriculture. According to the latest information collected in 2012, the number of cattle in the village was 1,163 heads, 416 pigs, 513 bee colonies.

The village was formerly known for its shoe manufacturing company with 40-50 employees which stopped functioning. The only non-agrarian members of the community include a very small stone manufacturer with 5 employee, local government, medical centre, a school and a kindergarten. The typical wage for an unskilled/seasonal agricultural job in the community is for:

- Men (adult) – 5,000-3,000 AMD in high/low season is
- Women (adult) – 5,000-3,000 AMD in high/low season in the last 12 months

High professionals such as driver, policeman, and electrician get an average daily wage of 7,800AMD. But the number of work days is less by 40% during the year. There is a significant number of overeducated but unemployed villagers (medical workers, engineers, lawyers).

**Table 13. The lowest/highest prices for products in Davit-Bek**

Local Unit name	English equivalent	Metric Equivalent	Price for local unit	Product
Դրամ	Dram	m3	10000	<b>Fuelwood</b>

Դրամ	Dram	Kg	300	<b>Rosehip</b>
Դրամ	Dram	Kg	500	<b>Blackberry</b>
Դրամ	Dram	Kg	1000	<b>Walnut</b>
Դրամ	Dram	Ton	15000	<b>Weat</b>
Դրամ	Dram	Ton	14000	<b>Barley</b>

#### d. Seasonal calendar

**Table 14. Major activities in Davit-Bek by month (H stands for harvest, S stands for sale and P for planting)**

Product Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Fuelwood</b>	H/S											
<b>Rosehip</b>	S	S	S						H/S	H/S	H/S	S
<b>Blackberry</b>									H/S	H/S	S	
<b>Walnut</b>	S	S							H/S	H/S	H/S	S
<b>Weat</b>	S			P					H/S	H/S	P	S
<b>Barley</b>	S			P					H/S	H/S	P	S

#### e. Major markets and market access

The distance from the village center to the nearest «market for major consumption goods», «market where agricultural products are sold», «market where non-timber forest products are sold» and the «market where timber products are sold» is 25km or 30 minutes drive by car.

#### f. Major land cover and land uses

Lands in Davit Bek measure 2,002 hectares, of which 844 ha is agricultural land, 409 ha is arable land, 76 ha is pastureland and 110 ha is residential and other lands. Community owns 150 hectares of grain crops. Special protected areas occupy 25 hectares. Forest land makes up 993 hectares where 963 hectares are forested.

Each household has 2.8 ha land on average. 46% of respondents use their land only partly because 87.5% cannot afford to pay the cost of irrigation water, fertilisers and rent the machinery. 12.5% assure that cultivating land is not a profitable business.

The sale value of one hectare of good agricultural land in the community (not degraded, not very steep), fit for common crops and accessible within 1 km from the main road or town ranges between 300,000 – 500,000 AMD.

#### g. Description of conservation areas

In addition to being one of the main forested regions in the country (total forest fund: 94,825 hectares), Syunik where the forest is concentrated, harbors the following forest protected areas: a) Shikahogh State Reserve, the second largest forest reserve in Armenia covering 100 km<sup>2</sup> of land. It has been largely unaffected by Armenia's rampant post-Soviet deforestation and is the only place where the forest remains intact; b) Plane Tree Grove, the largest natural relict plane grove in the world occupying 60 hectares.

## **h. Tenure and governance**

All forest resources of the community belong to the state and are managed by the Ministry of Agriculture of Armenia through its state forest agency “Hayantar” SNCO. Use of water resources is permitted by Water Resource Management Agency under the RA Ministry of Nature Protection, other natural resources managed by the RA Ministry of Energy and Natural Resources.

## **i. Government and other development/conservation projects**

No major government programs are known in the community. Orange Foundation and Shen NGO implement charity projects aimed at developing the vulnerable rural communities of Armenia which also covered Davit Bek being a borderline community. They supported opening the first gym to help local people keep their life active and healthy.

Recently, the government passed a Decree on «Free Provision of Deadwood to Forest-dependent Communities» which allows forest communities to collect from forest up to 8 m<sup>3</sup> firewood per household per year.

## **j. Calamities**

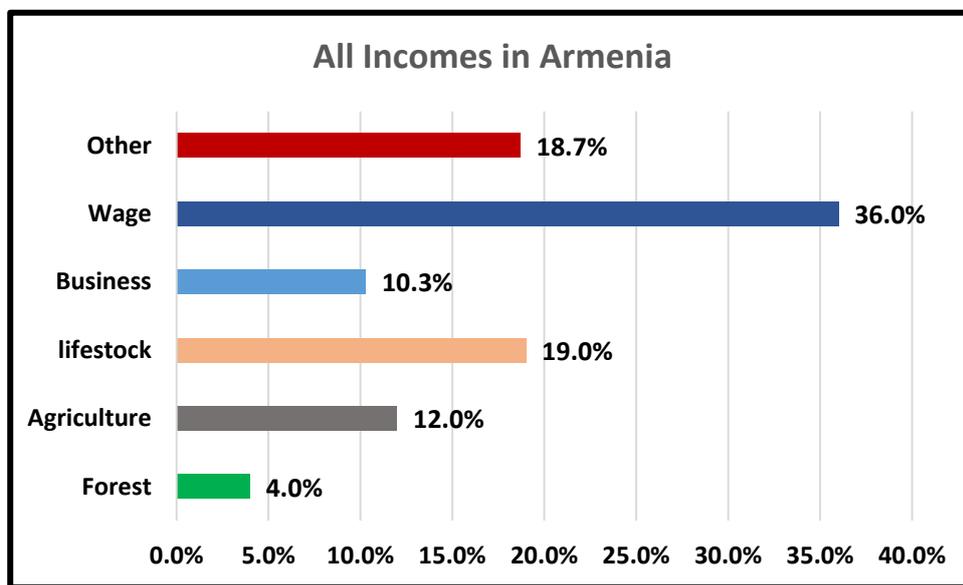
No significant calamities that may affect the data have been observed.

## 4. Results and Discussions

### 4.1 Income share by sources

The household survey revealed that «Wage» - 36.0% and «Animal» 19.0% incomes as the two major income sources in all forestry regions of Armenia.

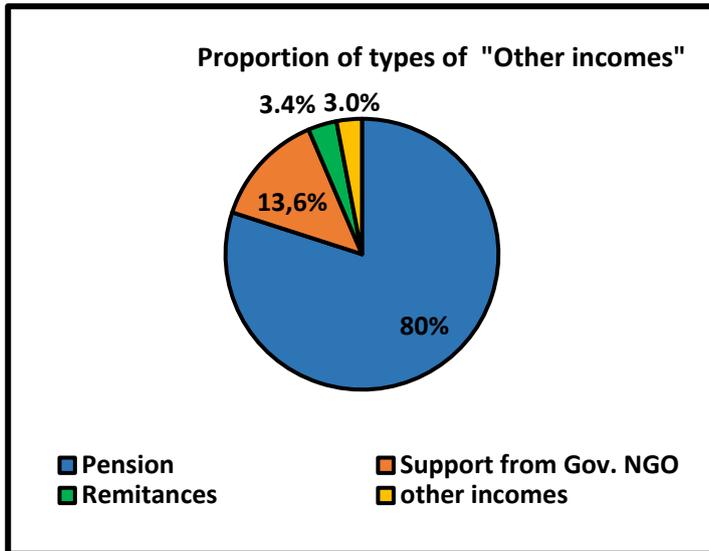
The Figure 1 illustrates the income division by sources, where «wage» and «animal» incomes, as well as «Other» income (18.7%), «Agriculture» (12.0%), «Business»(10.3%) and «Forest» (4.0%) are important income sources in the targetted communities of Lori, Tavush, Gegharkunik and Syunik provinces where survey was conducted.



**Figure 1. Income share by source in Armenia**

The high percent of «Wage» is reasonable due to a great number of military servants among community members as the forestry regions in Armenia are situated mainly along insecure borders. Three in four study areas are found in provinces bordering other countries. The «wage» income is also the highest among other incomes as most of the surveyed families have at least one member with stable salary in school, local government or medical centre or involved in individual construction or working as a mechanics specialist.

The Figure 1 show 18.7% of the «Other» income, which mostly aggregates incomes from pensions (80%) and state social welfare supports (13.6%). The latter are respondents from households living below the breadline. In the «Other» line income (3.4%) is represented as private remittances because some households receive financial support from relatives living abroad.



**Figure 2. Proportion of types of "Other incomes"**

Based on our household survey data and other study materials, we concluded that all 4 target villages have a grim prospect of aging communities because of high level of youth migration and low level of birth rate and decreasing number of economically active population.

«Agriculture» is the forth important income source for our respondents. The community has a potential of having more income from agriculture as villagers factually do not use their lands wholly and effectively. According to our estimates 46% of our respondents use their private land only partly, as they cannot afford to pay the cost of irrigation and fertilizers (62.3%), because the land is not a profitable source (35%), because the land parcels are too far from their houses (33%). The last line includes households which have no means of transportation or perfect health.

The income division by sources in Figure 3 illustrates essential regional differences in importance of income sources for villagers.

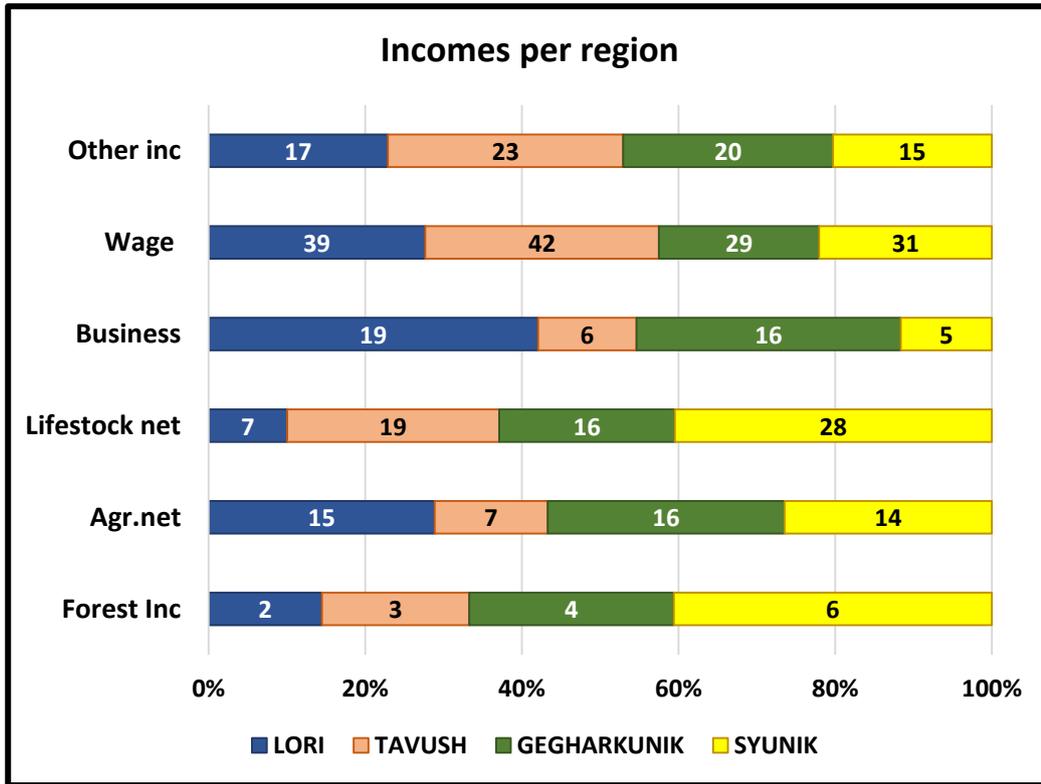


Figure 3. Income share by source in four regions of Armenia

The comparative analysis of the provinces show that «Wage» income is high in all 4 villages, but the highest was recorded in Tavush and Lori.

Table 15 shows the typical wage for an unskilled/seasonal agricultural job for adult men/women in high/low season in the community during the last year (12 months).

Table 15 The typical wage for an unskilled/seasonal agricultural job counted by PPP (for Armenia 192.53)

Wage PPP	Dsegh	Gandzakar	Dprabak	Davit Bek
Max/ high season	male 10.4	male 52	male 26	male 26
	female 7.8	female 31	female 10.4	female 26
Min/ low season	male 7.8	male 31	male 15.6	male 15.6
	female 5.2	female 15.6	female 5.2	female 15.6

It is the lowest in Dsegh and the highest in Gandzakar.

The agriculture income is high in Geghargunik and in Lori. With regards to livestock income, Syunik region demonstrates the highest percentage (28%) of income while the lowest (7%) was captured in Lori. Analysing the correlation of animal income with volumes of livestock property and inputs we have estimated that nearly 25% of respondent households in all regions have lost out and are in big debts. Despite the seemingly good percent of «Business» income particularly in Lori and Gegharkunik regions we cannot relate it to good business opportunities in these villages, because in each community we met only one person with high business income.

With regards to the most interesting income, the forest income with highest percent was captured in Syunik 6% and its lowest percent was in Lori 2%.

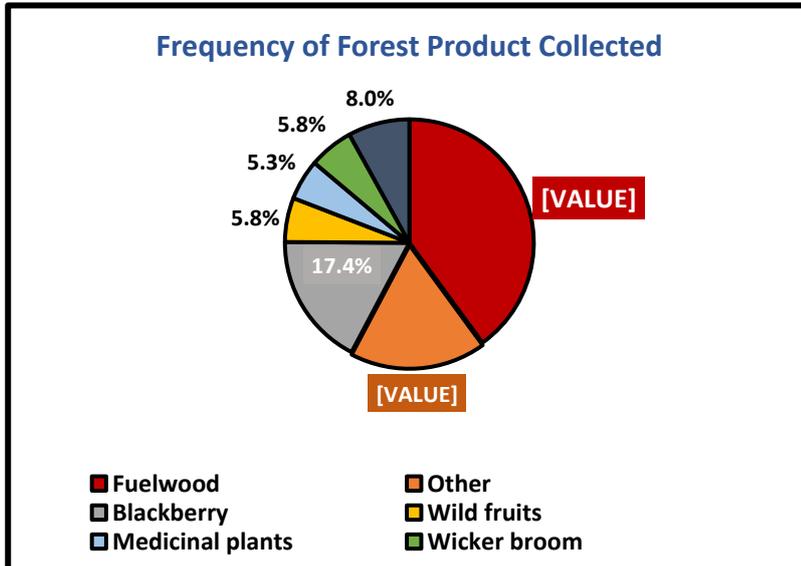
**Table 16. Income Sources per Province**

	Forest Inc.	Agriculture net	Livestock net	Business	Wage	Other	Total income net
LORI	2%	<b>15%</b>	7%	<b>19%</b>	<b>39%</b>	17%	100
TAVUSH	3%	7%	19%	6%	<b>42%</b>	<b>23%</b>	100
GEGHARKUNIK	4%	<b>16%</b>	16%	16%	29%	20%	100
SYUNIK	<b>6%</b>	14%	<b>28%</b>	5%	31%	15%	100

## 4.2 Frequency and value of forest products

The study showed that forest-dependent communities in Armenia collect some 10-13 different forest products. The Figure 4 illustrates the percentage distribution of the most common forest products collected by communities.

We have chosen the six dominant forest products: fuelwood (frequency 74 from 190), wild berries (frequency 33 from 190), rosehip (frequency 15-190), wild fruit (11-190), wicker broom (11-190) and medicinal plant (10 from 190).



**Figure 4. Frequency of Collected Forests Products**

The analysis of forest products, the frequency of their use and application techniques and the main gatherers has first of all revealed a high culture of mechanical and thermal treatment of food collected in the forest. Berries and wild fruits occupy an essential place in the Armenian cultural cuisine. All households are involved in making of jams, juices, compotes, dry fruits and distilling various types of vodka. Rosehip and medicinal plants are the main tea sorts for Armenia. In June-July green walnut is used to make jam and as a nut platter in late autumn and appetizer in most dishes. Blackberry is primarily used to make jams and juices. The forests of Armenia are famous for their wild Cornelian cherry or cornells which are used abundantly to make not only jams, juices and vodka. It is also used as a souring agent in souces and soups and are claimed

to improve the gastrointestinal tract and overall health. Because they are so popular among Armenians and have multiple health benefits, cornells known also as Noah's Fruit.

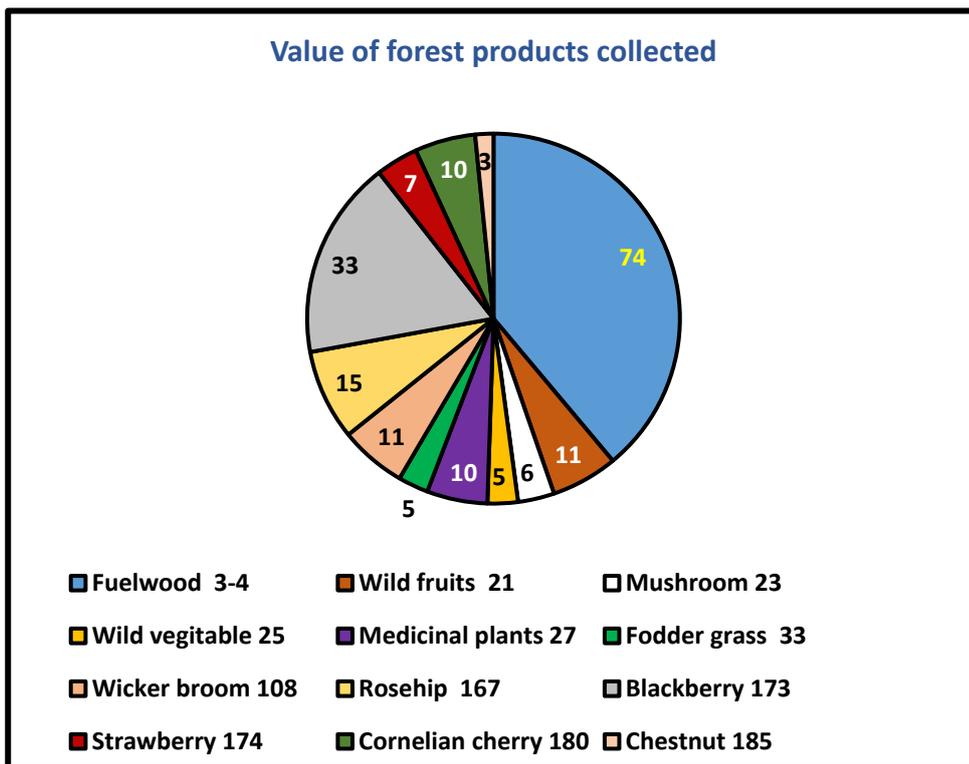


Jams made by Armenian women



Drying of wild vegetables

With regards to the forest products in each targeted region, firewood is common and essential type for all communities, but the collection of berries and wild fruits are different in different communities.



**Figure 5. Value of forest products collected in Armenia**

Secondly, it was revealed that household family members are involved in forest food collection equally: female and male adults and children. But there is a distinct job division: firewood, chestnut and broom collection is only a female privilege, as it is a very hard work.

**Table 17. Value of forest products and their consumption**

	Forest product	Frequency	Collected for	Mainly collecting
1.	Firewood	74 from 190	For heating and cooking during all 12 months and for selling	Male adult of the family with hired workers
2.	Blackberry	33	For compote and for jam own consumption and for selling (fresh).	Female and male adult of the family
3.	Rosehip	15	For juice and for tea own consumption and for selling	Female and male adult and children of the family
4.	Broom	11	For sweeping yard, barn and stud	Male adult
5.	Wild fruits	11	For cooking in spring and dried for winter	Female adult and children of the family
6.	Medicinal plants	10	For teas own consumption and for selling (fresh and dry)	Female adults of the family
7.	Chesnutt	10	For own consumption and for selling fresh and dry	Male adult and children
8.	Wild Strawberry	7	For compote and for jam own consumption and for selling (fresh)	Female and male adult of the family

### 4.3 Fuelwood

Firewood plays an important role in the lives of rural communities, contributing on average 61% of forest income. The firewood incomes in different provinces were captured as follows: 85% of forest income in Syunik, 64% of forest income in Gegharkunik, 57% of forest income in Lori and 33% of forest income in Tavush.

The Figures 6a, b, c, d illustrate that firewood values in Syunik and Lori are the highest than in others.

Figure 6a.

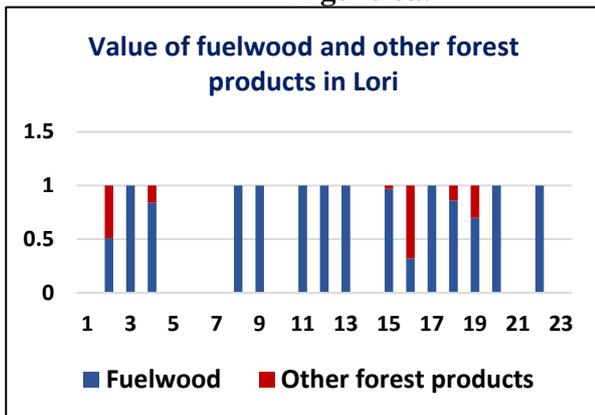


Figure 6b.

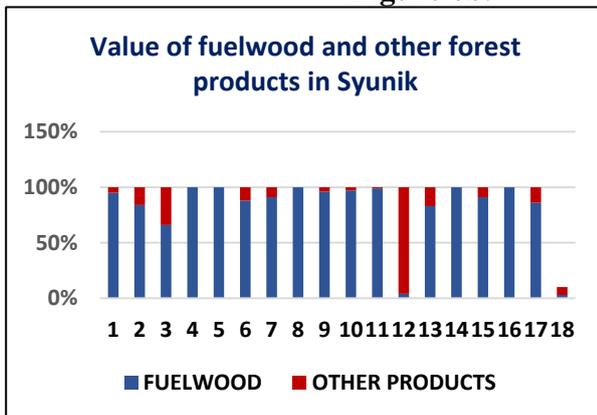
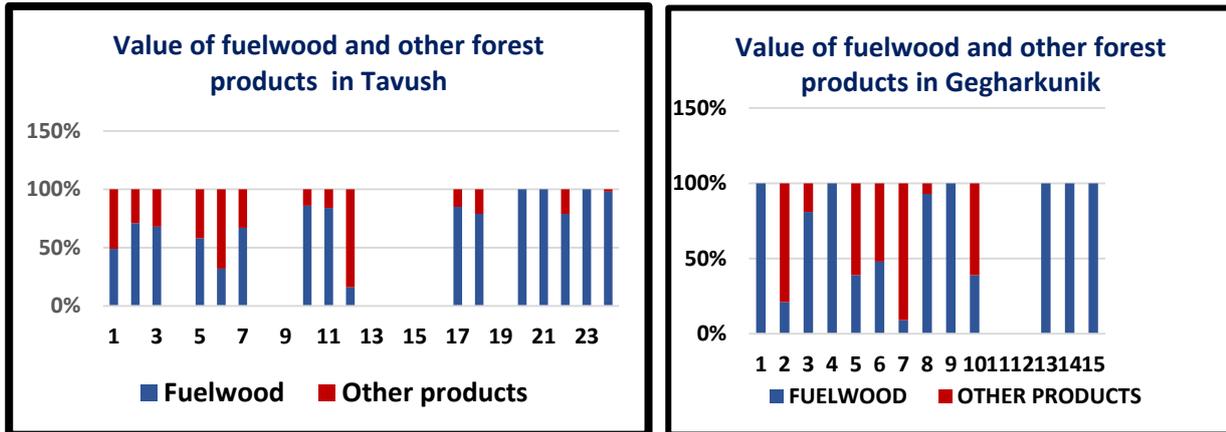


Figure 6c

Figure 6d



However, provided that the level of reliability of public opinions which was observed during the household face-to-face interviews and community meeting discussions, the community dependence on forest, especially firewood is largely underreported and may be much higher than it is actually presented in our survey. The respondents, particularly male individuals were not open to provide information on income they receive from fuelwood. This was confirmed through analysis of data on «Used», «Collected», «Purchased» firewood and «Cash» in it. See Figure 7 and Table 17.

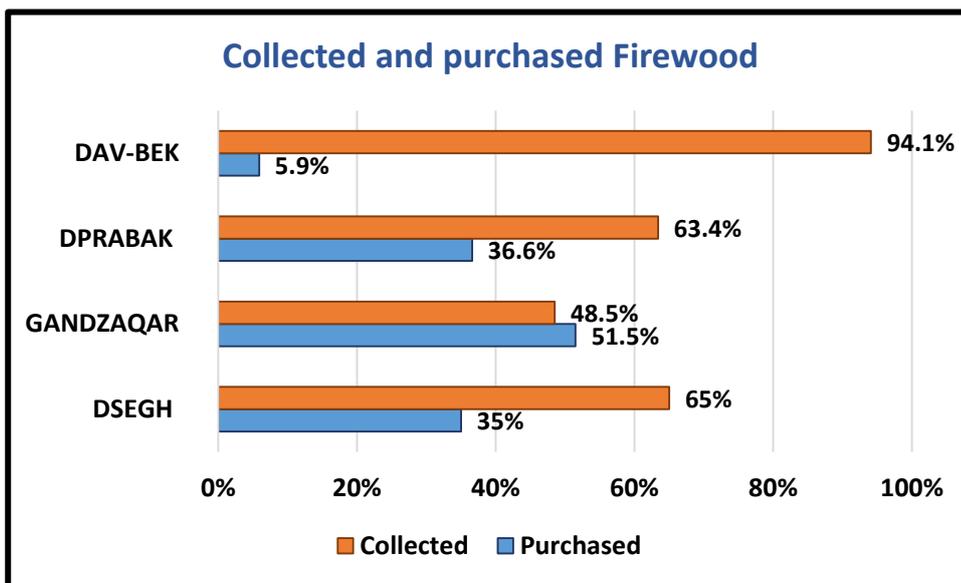


Figure 7. Total volumes of collected and purchased firewood (%)

In Tavush households have collected the least volume of firewood (48.5%) in total over the last 12 months and purchased 51.5%. In Syunik maximum total firewood collected by family is– 94.1%. On average 33% of firewood used by household is purchased from neighbors involved in logging industry.

Table 18. Fuelwood collected /purchased by household, cost per m<sup>3</sup> and average use over the last 12 months for each village

PROVINCE	VILLAGE	Fuelwood collected/purchased by households	Average use of fuelwood by household

LORI	DSEGH	Purchased 35% (average 7,000 AMD per m <sup>3</sup> )	8.8m <sup>3</sup>
		Collected 65%	
TAVUSH	GANDZAKAR	Purchased 51.5% (average 10,000)	10.0 m <sup>3</sup>
		Collected 48.5%	
GEGHARKUNIK	DPRABAK	Purchased 36.6% (average 8,500AMD)	9.0m <sup>3</sup>
		Collected 63.4%	
SYUNIK	DAV-BEK	Purchased 5.9% (average 10 000AD)	13.0m <sup>3</sup>
		Collected 94.1%	



Household backyard in Davit-Bek

Part of households cut their firewood directly in the forest, the rest collect only the fallen branches which originate after logging. But most community households are lonely elderly people and do not have enough strength to access areas where fallen wood is generated. They have to purchase it. Because firewood is the cheapest (oftentimes free) and accessible resource base, households depend on this energy source primarily for heating and cooking. Despite that natural gas is available in most rural communities of Armenia, this did not lead to full substitution away from fuelwood. Mains gas is a more expensive product than fuelwood and does not minimize local people's dependence on the forest. In addition, the majority of rural households have

old and large-size buildings which do not meet energy saving requirements. Dependence on fuelwood is also amplified by geographical specifics of the areas such extended harsh winters.

The firewood dependence in Lori province is the lowest - 8.8 m<sup>3</sup> per year and is the highest in Syunik - 13m<sup>3</sup>.

The Armenian government has ratified a decree, whereby an access of up to 8 m<sup>3</sup> of fuelwood is provided to forest-dependent communities. It is given per household per year and is intended for those households and communities that are adjacent to forest. This regulation on free provision of fallen wood certainly removes the risk of getting caught without a permit and a certain share of households will collect fallen wood. This benefit mostly applies to the poorest families who are able to collect wood themselves instead of buying fuelwood from middlemen or trucks.

Beyond the terms of this regulation, «Hayantar» SNCO has no obligation to supply any firewood to rural population. If more firewood is needed, there are several options for households to obtain the wood: a) they may collect it illegally from forest, b) they can buy fuelwood if they pay nature consumption tax or if there are already allocated logging areas, c) they can buy fuelwood directly from «Hayantar» SNCO at the price of 11,000 Armenian drams per one cubic meter.

Armenia has no timber production forests. Logging is allowed only for sanitation purposes, as well as for the purpose of improvement or intermediate thinnings and other cuttings, but no production harvest is allowed. If people collect for their own (household) use, they do not need to pay or ask for a permit, if the harvest is performed for sale or other like purposes, they must pay a nature consumption tax in accordance with the government decree No. 864 of December 30, 1998.

#### Nature consumption taxes

- ❖ Widely used medicinal herbs, 100 AMD/kg for above-ground parts, 300 AMD/kg for roots, other herbs accordingly 50 and 200 AMD
- ❖ Widely used food plants, 15 AMD/kg for above-ground parts, 50 AMD/kg for roots, other food plants accordingly 10 and 30 AMD
- ❖ Technical plants 50 AMD/kg for above-ground parts, 150 AMD/kg for roots
- ❖ Decorative plants 10 AMD/kg
- ❖ Herbal resins 500 AMD/kg
- ❖ Fruit and berries 30 AMD/kg
- ❖ Walnuts 60 AMD/kg

Permits to collect wood are issued by the local government, specifically «Hayantar» SNCO, the state agency which regulates the forest use, forest maintenance and rehabilitation, and also controls the State Forest Fund area. The government decree No. 864 has established a set of nature consumption charges for timber harvest which are shown below.

However, despite such legislative act has been developed, local communities are not charged the taxes for collection of non-timber forest products by the government due to high levels of poverty in villages and difficulties in separating and tracking the share of the sales volume in the total gathered.

**Table 19. Nature use taxes applied to harvesting of certain forest products.**

Type of tree	Distance from forest border (km)	Nature use charge rate (AMD)				
		Construction wood without peel` diameter (cm)			Technological wood (1meter length with peel)	Firewood (1 meter length with peel)
		More than 25	13-25	3-13		

Oak, flowering ash, maple, elm	Till 10	5700	5250	4380	2600	700
	10-25	4390	4040	3370	2040	630
	25-40	3990	3670	3070	1670	560
	More than 40	3420	3150	2630	1300	420
Saugey, Lime	Till 10	3300	3000	2540	1200	700
	10-25	2540	2310	1950	1060	630
	25-40	2310	2100	1780	930	560
	More than 40	1980	1800	1520	800	420
Beech	Till 10	3000	2700	2310	1500	700
	10-25	2310	2080	1780	1155	630
	25-40	2100	1890	1620	1050	560
	More than 40	1800	1620	1390	900	420
Hornbeam and other species	Till 10	1250	1100	960	500	420
	10-25	960	850	740	360	350
	25-40	870	770	680	280	280
	More than 40	750	660	580	250	210

## 4.4 Cash and subsistence of forest products

Based on the household survey, it has been estimated that the firewood and tree branches combined bring to local people in target villages 5,658,000 AMD and an average of 76,460 AMD per household per year. The survey respondents tried to assure that all collected fuelwood is used for subsistence purpose only (see Figure 8).

The highest cash income comes from Blackberry but it is not essential – only 35,000 AMD (some \$72) per year. It is then followed by Walnut which generates 14,000 AMD and Cornelian cherry generating 10,000 AMD per year, respectively. On average 90% of the three mentioned three products are collected for own use and only 10% is offered for sale.

Forest products are a free income sources for local population and are not charged by the government in Armenia.

As we see the level of cash in our target villages is very low, barely making up 1% (90,600 AMD in total). However, it must be reiterated here that the information provided by respondents with regards to cash and subsistence income from firewood is not trustworthy as it was explained in chapter 4.3.

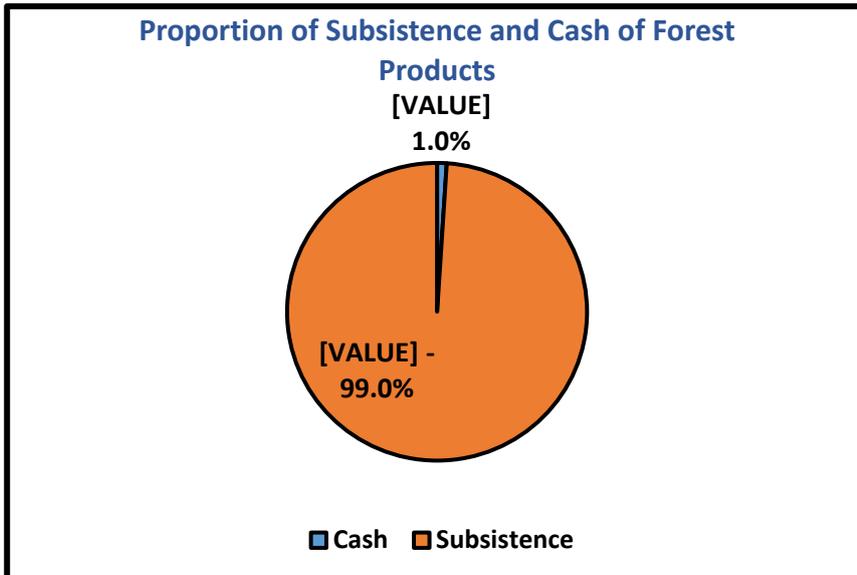


Figure 8. Proportion of Subsistence and Cash of Forest products

The list of subsistence products is topped by Firewood generating 5,658,000 AMD. Blackberry comes second with 250,600AMD, which is then followed by Walnut - 139,000AMD and Cherry - 95,000AMD a year. See Figure 9.

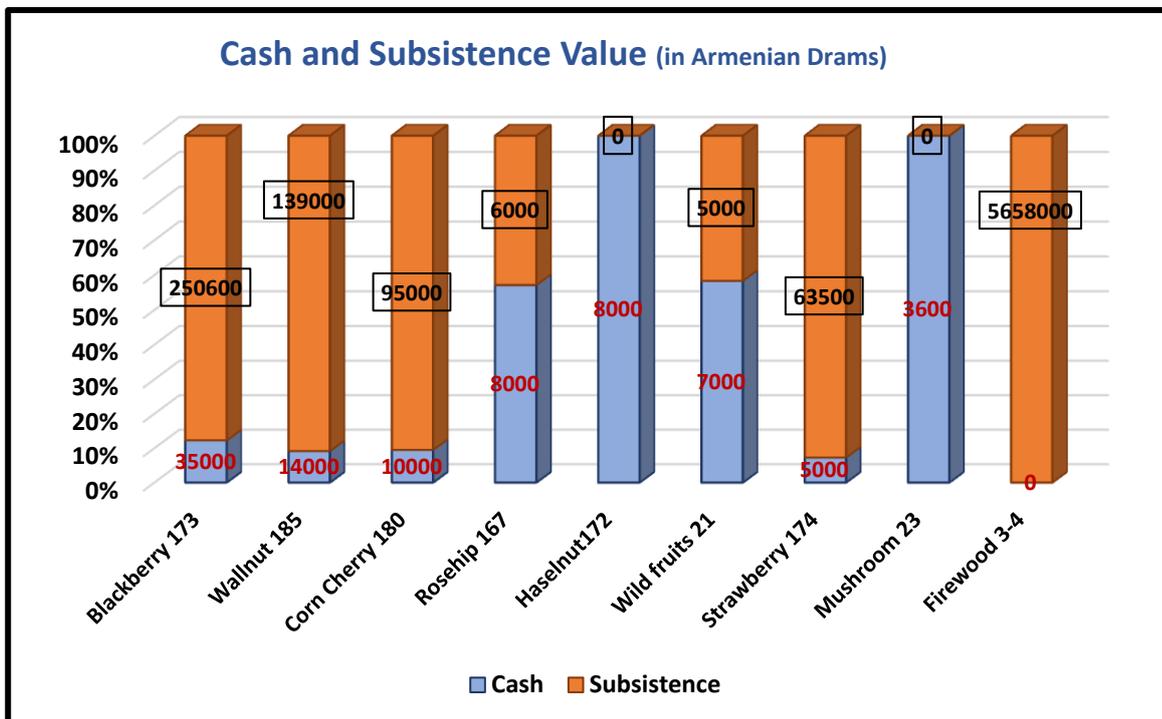


Figure 9. Forest Subsistence and Cash Value

## 4.5 RFI over income quintiles

The Resource Forest Indicator (RFI) is equal for Quintiles 1, 3, 4 and high for Quintile 2.

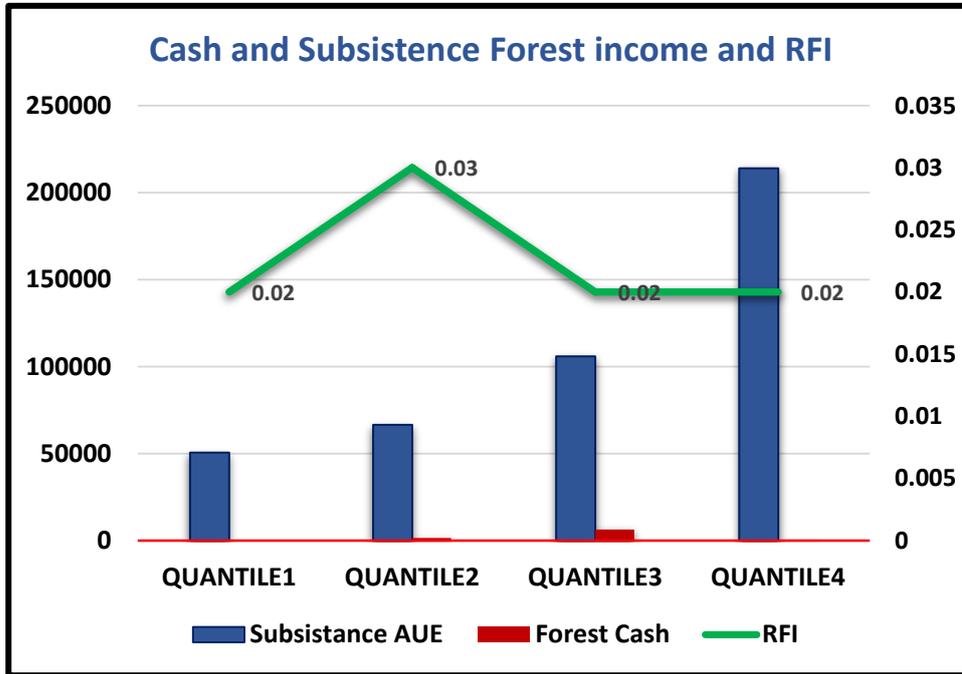
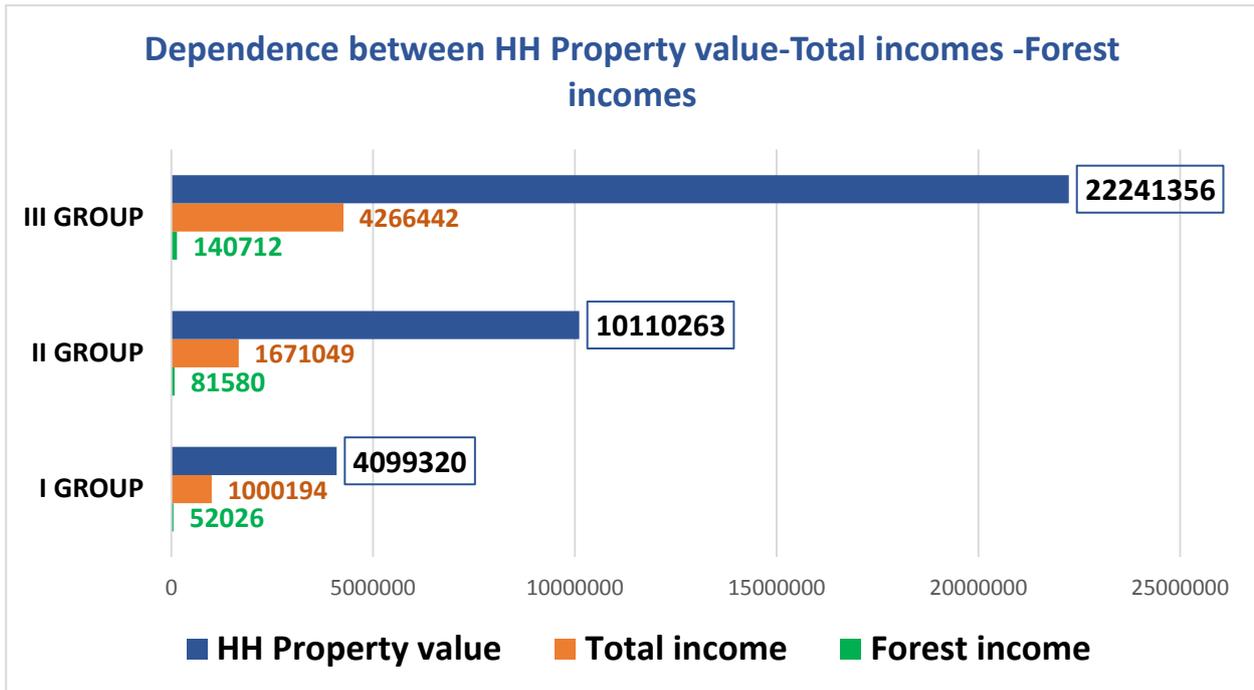


Figure 10. Cash and Subsistence Forest Income and RFI

The Diagram above (Figure 10) shows a very low level of cash for all quintiles. It is evident that market relations for forest and also for agricultural products are not developed in Armenia. We have revealed a lack of any cash for Quintile 1 and 4, whereas Quintile 1 has the lowest forest income and Quintile 4 has the highest forest income. Households in Quintile 1 have a problem of forest and market accessibility due to their age, health limitations as well as limited supply and transport capacities. Quintile 4 has a good and free access to forest and a hidden cash for firewood.

The analysis of dependence between Household property value (total from HH assets, house, land and livestock) total and forest incomes over the last 12 months demonstrates a direct dependence between household property value - total income - forest incomes. The total and forest incomes are increasing with an increase in household property value (Group I – poor, Group II medium, Group III - rich). See Figure 11.



**Figure 11. Dependence between Household Property Values, Total and Forest Incomes over the last 12 months**

Overall, we have the following pattern for average assets: «Poor», «Medium» and «Rich» Forest income and Resource Forest Indicator.

The RFI is a little high for Medium level households and for Quintile 2, which in 65% are the same households.

**Table 20. Forest income by assets and RFI**

	I group	II group	III group
Forest income	52026	81580	140712
Total income	1000194	1671049	4266442
HH Property value	4099320	10110263	22241356
RFI	0.02	0.025	0.02

The «poor» have the worst access to forest resources, while the «rich» have a better access to forest because they keep the power in each community, they are vested with good harvesting techniques and machinery, and have strong connections with the local bodies such as forest inspectors and the police.

Also our correlation between age, occupation and forest income reveals a direct link between:

- Level of forest incomes and number of adult family members (4 and over)
- Level of forest incomes and the fact of employment in state structures (local government, school, medical organization, army, police) and involvement in business (all business cases belong to the «riches» group). The mentioned professional groups are privileged groups of the community and are provided with better capacities to access forest than the other groups.

The picture of RFI over asset groups does not require any comment: RFI is 0 for all asset groups.

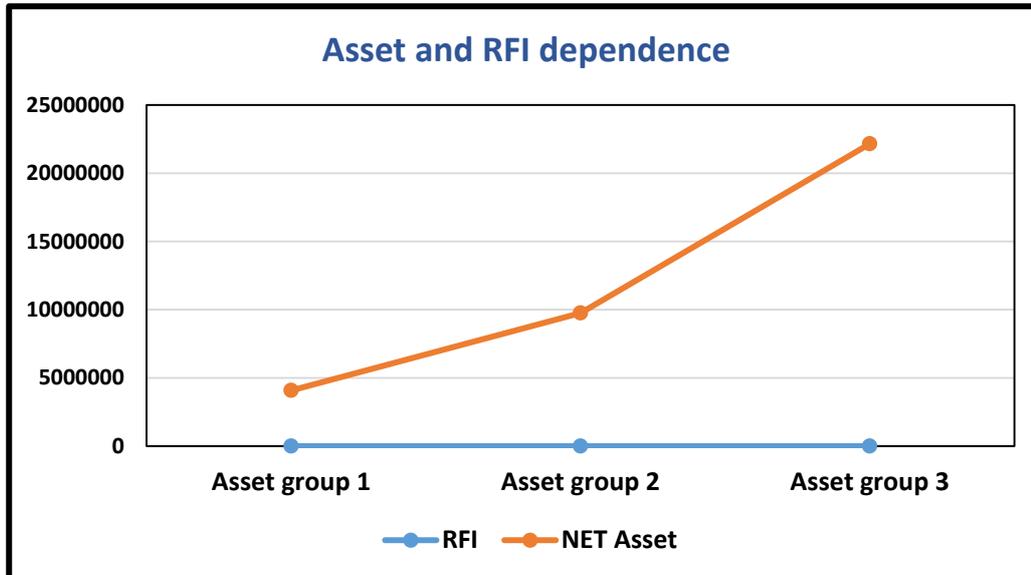


Figure 12. The RFI over asset groups

## 4.6 Most important products

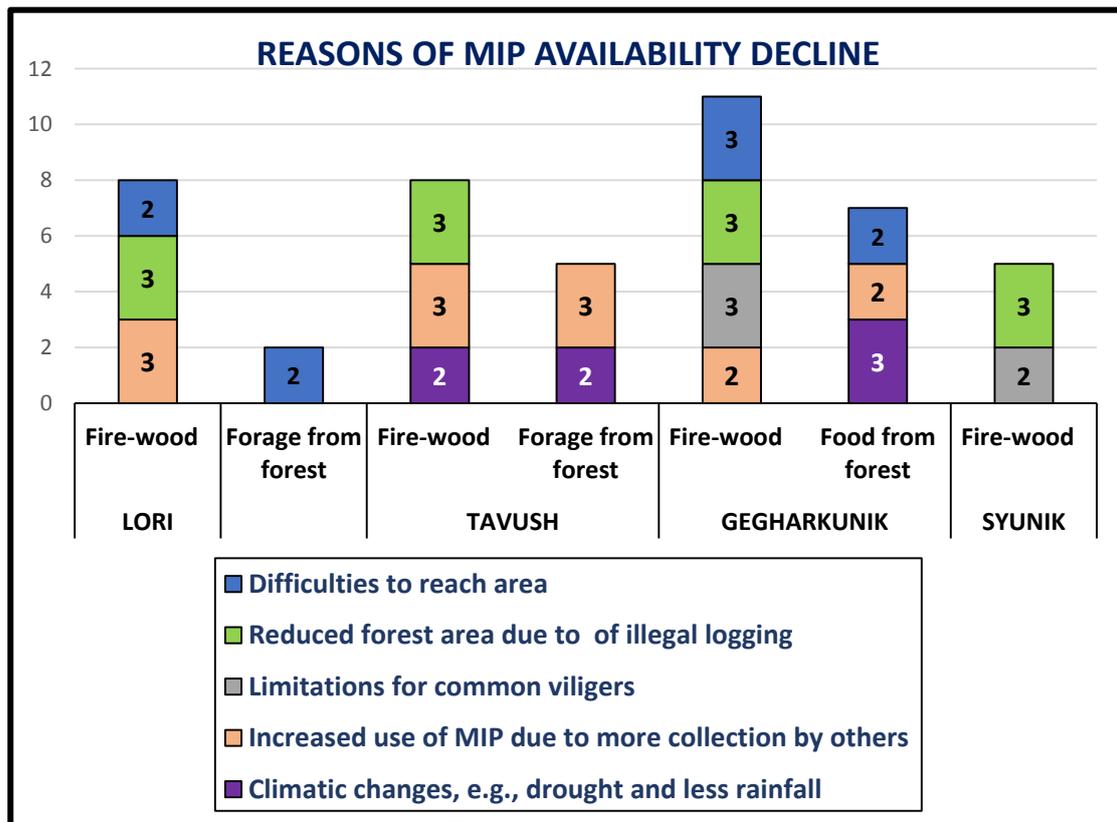
The community meetings held in villages aimed to reveal «How has availability of the MIP changed over the past 5 years? », «What are the reasons of MIP decline? », «What would be most important to increase the use or income from the MIP?» The analysis of recorded information suggested that «Firewood, charcoal, timber or other wood» (Category 1) are the Main important products (MIP) for all regions and their value is more than half among all forest incomes. In all villages of all regions community members mentioned a decline in firewood of availability.

«Food from the forest» (Category 2) according to community members in all regions remained almost unchanged except in Gegharkunik region. In Lori «Food from the forest» was represented by Blackberry, Raspberry, Blackberry and Cornel in Tavush, Wild pear and Rosehip in Gegharkunik and Blackberry and Rosehip in Syunik. In Gegharkunik the most important product was mostly Wild pear which is declining due to continual logging and cutting of pear trees.

As «Forage from the forest» in Category 3 «fodder grass» and «acorn» were mentioned as important by community members. These products have declined in Lori and Tavush provinces but remained relatively same in other regions.

Figure 13 illustrates the feedback of villagers explaining the reasons of MIP declines:

- Reduced forest area, because of illegal logging. Armenia has no timber production forest. Logging is allowed only for sanitation purposes, as well as for the purpose of improvement or intermediate thinnings and other cuttings, but no production harvest is allowed.
- Increased use by foreigners from regional and administrative centres
- Climatic changes. Extensive rain periods in spring and drought in summer leave a negative impact on common vegetation
- Difficulty in accessing areas of all types of MIP. The state weak sanitation activities and disorderly tree cutting and overgrown bushes destroyed paths.



**Figure 13. Reasons for Decline of Most Important Forest Products (*most important reasons, max. 3*)**

During discussions, the following suggestions were made by community members on «How to increase the use or income from the MIP»? Figure 14 illustrates classified proposals recorded in all 4 villages. These are:

- Better access to MIP, more rights
- Avoid overuse of «self-privileged» groups
- Have local permanent staff for sanitation/treatment care of seedlings
- Raise awareness / knowledge about the rights of community members (this is a critical point as all respondents in Syunik and half of respondents in northern forested regions were unaware of their rights for free provision of 8 m<sup>3</sup> of fallen wood to rural communities)
- Better market for forest food products

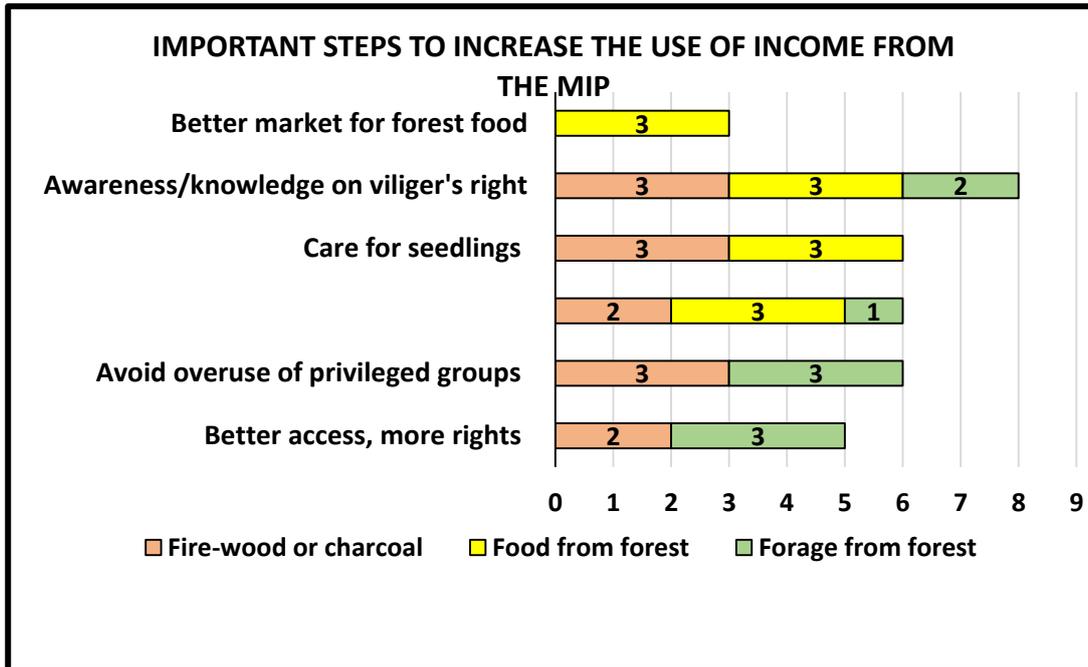


Figure 14. What would be most important to increase the use or income from the MIP in Armenia? (most important reasons, max. 3)

## 5. Conclusions

The study on forest dependence of rural communities in Armenia implemented during the years of 2015-2016 has shown that the national forest dependence is 4% with more variations in different regions and within study sites. It has confirmed again that fuelwood remains an important source of energy despite the gasification available in most communities but which is out of the reach for rural households due to high gas prices and costs of installation. The analysis has shown that forest income makes up a larger share of total household income if the household is poorer. Non timber forest products (berries, mushrooms, etc) support greatly the cash income.

Most communities claimed that forest products are declining in availability due to overharvesting, illegal logging, and climate change which results in the shrinking of their resource bases. Thus, the need to understand how people depend on nature is critical so that the relevant measures can be taken and the findings of this study (particularly suggestions from communities) could be used by relevant decision-makers to improve the management of the forest in Armenia on which so many rural population directly depend and use this potential to implement the future forest landscape restoration (FLR) projects successfully.

The study covered all forestry regions in Armenia and aimed to:

- a) understand the role and value of the forest to target village and to whole society,
- b) identify income share by sources and percent of forest income in it
- c) identify reasons behind the decline and increase of forest products
- d) demonstrate how the human dependency on forest changes between communities within the same country (different regions), at their stages of economic development (meso-level) and with differential access to markets (micro-level).

During the study a variety of sociological methods were used: Key informant interviewing, Community meeting discussions and Household survey.

Despite the very limited forest cover in Armenia the role and value of the forest in the lives of local population and the society overall is obvious. The research studying the nature of relationship between people and forest in the regions of Lori, Tavush, Gegharkunik and Syunik revealed some 10-13 different most important forest products that are available and are used by local communities. The most important product in all regions is the one classified as «Fire-wood, charcoal, timber or other wood» which is more than half among all forest incomes: an average of 61%. A decline in its availability and in income for this product and for «Forage from the forest» has been recorded.

With respect to the Frequency and Value of forest products collected in Armenia, fuelwood is leading the chart (74% out of 190%). In different regions the availability of gas infrastructure and supply did not lead to full substitution away from fuelwood. Despite the similarity of climate conditions the lowest dependence on firewood was recorded in Lori province (8.8m<sup>3</sup>) and the highest was captured in Syunik (13m<sup>3</sup>). On average 61% of firewood used by households is collected by family members and 33% of that firewood is purchased from other community members (middlemen) for whom it is an occupation. Other than firewood, the remaining most important forest products include berries, wild fruits and forage.

The income share by sources illustrates two major sources of income: «Wage income» (36.0%) and «Animal income» (19.0%). The «Forest income» occupies the last place with an average of 4.0%. Overall, the lowest forest income has been estimated in Lori and the highest has been in Syunik region.

Within one country the human dependency on forest changes from community to community. It is largely due to differences in the economic development (meso-level) and markets access (micro-level) of rural communities. In particular, forest income variations of 2-6% in different villages were mainly due to on-the-ground factual forest management system and demographical features of local community.

The dependency of rural community on forest is mainly at subsistence-level as the culture of market is not well developed in Armenia. Cash and Subsistence Forest income and RFI show very low level of cash for all quintiles. It is only 1%. Most of (52%) of community members dream of a better market for forest food products, since the fuelwood market is well established and even monopolised.

The lack of cash has been recorded particularly for «poor» and for «rich» households (Quintiles 1 and 4). In case of the «poor» (Quintile 1) it can be explained by difficulties experienced with product sale due to age and health limitations of their family members and limited transport capacities. In case of the «rich» (Quintile 4), it points to the hidden cash from firewood which could not be captured methodologically by our survey questionnaires.

The observation of dependence between household property value (total from household assets, house, land and livestock) and forest income over the last 12 months revealed a direct dependence between household property value and forest income. Said differently, the forest income is increasing with increase in household property value. So, the fuelwood and forage forest products are more accessible to the «rich» (Quintile 4) and Asset Group III, who have the weight and power in the community and a stable wage income and machinery.

During the last 5 years the use and access to firewood and forage in target communities declined because of «reduced forest area» from illegal logging and weak state restoration and sanitation activities and community's alienation from any decision-making and monitoring processes. When questioned «How to increase the use or income from the MIP?» the following solutions were proposed by community members:

- Better access for to MIP, more rights
- Avoid overuse of fuelwood and forage by privileged groups
- Local permanent staff responsible for sanitation/treatment and care for seedlings
- Awareness rise on own rights
- Better Market for forest food products.

Our research into forest dependence of rural communities allowed us to understand that the welfare of forest-dependent rural families and their meaningful use of the forest is largely affected by the following recorded socio-economic and ecological factors:

***Socio-economic:***

- High level of youth migration and aging of rural communities, reduced economically active labour potential
- High number of poor households and single elderly families, which have not only low forest income but also income from agriculture and animals. The costs for physical and financial inputs are very high for them.
- Market monopoly / corruption in the forest sector and limited opportunities for small- and medium-sized businesses. It has made cash income of a common villager scanty and beneficial for force-keepers.
- Low awareness and poor knowledge of local community members about their rights and responsibilities for forest use and protection.

***Environmental:***

- Illegal logging reduces the availability of all forest products for local people
- Climate change (lengthy periods of spring rainfalls and extensive summer droughts) continually cause changes and modify the pattern and calendar of forest vegetation.

The above mentioned brightly illustrates the gaps which are not addressed by the current forest management in the country. This new knowledge product developed through a comprehensive study of forest dependent communities can be used to improve forest management in Armenia, make the forest more valuable for all strata and help common villagers overcome difficulties when using forest as its welfare, as well as for its cultural, leisure and aesthetic activities.

Armenian forests hold a high potential to attract good financial, ethical and aesthetical income as they are rich in high quality wood, charcoal, used as animal forage, harbour a rich diversity of wild fruits, vegetables and medicinal plants. They offer very good prospects for tourism development, especially ecological and cognitive tourism.

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## About FLEG II (ENPI East) Program

The Forest Law Enforcement and Governance (FLEG) II European Neighbourhood and Partnership Instrument (ENPI) East Countries Program supports participating countries' forest governance. At the regional level, the Program aims to implement the 2005 St. Petersburg FLEG Ministerial Declaration and support countries to commit to a time-bound action plan; at the national level the Program will review or revise forest sector policies and legal and administrative structures; and improve knowledge of and support for sustainable forest management and good forest governance in the participating countries, and at the sub-national (local) level the Program will test and demonstrate best practices for sustainable forest management and the feasibility of improved forest governance practices at the field-level on a pilot basis. Participating countries include Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russia, and Ukraine. The Program is funded by the European Union.

<http://www.enpi-fleg.org>

## Project Partner



### EUROPEAN COMMISSION

The European Union is the world's largest donor of official development assistance. EuropeAid Development and Cooperation, a Directorate General of the European Commission, is responsible for designing European development policy and delivering aid throughout the world. EuropeAid delivers aid through a set of financial instruments with a focus on ensuring the quality of EU aid and its effectiveness. An active and proactive player in the development field, EuropeAid promotes good governance, human and economic development and tackle universal issues, such as fighting hunger and preserving natural resources.

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[www.panda.org](http://www.panda.org)