Study and Analysis of Innovative Financing for Sustainable Forest Management in the Southwest Balkan

Innovative Financing for Sustainable Forest Management, Completion Report

Financed by: WB – PROFOR
Contract no: 7160594

PROFOR

CONNECTING NATURAL VALUES & PEOPLE

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Date prepared:

September 2013

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About the Project

CNVP in a consortium with NRS Kosovo, REGEA Croatia, Diava Consulting, Albania, Faculty Forestry, Macedonia and Wageningen University, The Netherlands is implementing the WB-PROFOR project on 'Study and Analysis of Innovative Financing for Sustainable Forest Management in the Southwest Balkans. This is a two year project, started November 2011, focused on reviewing and studying the role and contribution of Sustainable Forest Management to securing environmental services. The project is implemented through two cases; in Albania on SFM and watershed management in the Ulza watershed, and in Kosovo on SFM and wood biomass production and use.

The project using the two cases will define scientifically sound methodologies, establish key baseline data for these cases and provide quantitative estimates of the value of some specific targeted environmental services. The project will based on the learning and results propose mechanisms to start or increase payment for environmental services in the two cases.

An important aspect of the project is dissemination of the results and experiences. The outcomes of the study and analysis will be shared and provided at a regional and more international level. A deliberate participation and consultation process is used throughout the project.

This Document

This is the completion report for the Study on Innovative Financing for Sustainable Forest Management. The report gives a summary of the results and outcomes for the two cases studies and is making use of the underlying studies and aspects. Referral is made to the specific project reports on the separate issues.

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1. Introduction

CNVP in a consortium with NRS Kosovo, REGEA Croatia, Diava Consulting, Albania, Faculty Forestry, Macedonia and Wageningen University, The Netherlands implemented the WB-PROFOR project on 'Study and Analysis of Innovative Financing for Sustainable Forest Management in the Southwest Balkans'. This was a two year project, started November 2011, focused on reviewing and studying the role and contribution of Sustainable Forest Management to securing environmental services. The project is implemented through two cases; in Albania on SFM and watershed management in the Ulza watershed, and in Kosovo on SFM and wood biomass production and use.

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There are many documents and specific results obtained from this study. All these documents are provided at the project website. A list of all publications is provided in chapter 5 of this report. Chapter 2 gives a short reflection on the PES concepts, while chapter three describes the results of the Albania Ulza Watershed case and chapter 4 the Kosovo Wood Biomass case.

The report provides a summary overview of the outcomes of the study while referring to the detailed results in the specific publications. At the start of the project an inception phase was completed providing the baseline and approach, refer for details to publications: PUB_01-Incepton part I final; *'Inception phase report, part I general project Albania and Kosovo',* PUB_02-Inception part II final; *'Inception phase report part II Albania Ulza Watershed case'* and PUB_03-Inception part III final; *'Inception phase report part III Wood biomass case'* under WB-PROFOR SFM PES project, April 2012.

2. PES concept

The study and analysis on innovative financing, uses the following definition of PES of Tacconi (2012):

"A PES scheme is a transparent system for the additional provision of environmental services through conditional payments to voluntary providers."

In practice PES schemes are quite diverse and therefore difficult to define, the following principles might help to grasp the PES concept (DEFRA, 2013): Voluntary: stakeholders enter into PES agreements on a voluntary basis;

- Beneficiary pays: payments are made by the beneficiaries of ecosystem services (individuals, communities and businesses or governments acting on their behalf);
- Direct: payments are made directly to ecosystem service providers (in practice, often via an intermediary or broker);
- Additionality: payments are made for actions over-and-above those usually required from land managers and others, i.e. providers should not be compensated for satisfying regulatory obligations (i.e. meeting 'polluter pays' requirements);
- Conditionality: payments are conditional on the delivery of ecosystem service benefits (in practice often for actions agreed likely to deliver the desired ecosystem services);
- Ensuring permanence: management interventions should not be readily reversible;
- Avoiding leakage: PES schemes should be set up to avoid leakage, whereby securing an ecosystem service in one location simply leads to the loss or degradation of ecosystem services elsewhere

The PES concept in graphically presented below[1]:

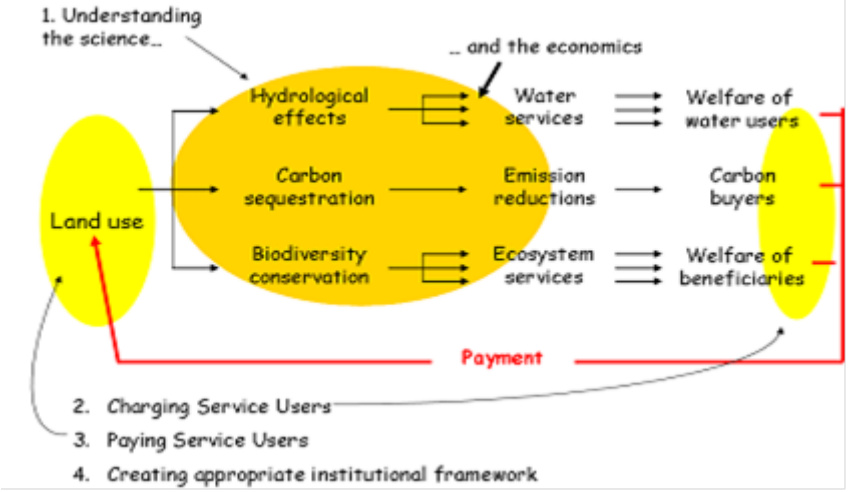


Figure 1: PES conceptual scheme

For more information on the PES concept, please refer to: PUB_08-PES Characteristics and Examples; *'Payment for Environmental Services: Characteristics and Examples, an Overview'* prepared by Iskra Konevska, Wageningen University under the WB-PROFOR SFM PES project, August 2013.'

1 - **http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTEEI/0,,contentMDK:20487921~menuPK:1187844~pagePK:210058~piPK:210062~theSitePK:408050~isCURL:Y,00.html**

3. Potential PES schemes for erosion control in watershed protection in Albania

3.1 Description of Ulza watershed

Ulza watershed is located in (and a sub-watershed of) the Mati river basin about 70 km from Tirana, covering almost the entire Mat district of Diber region. The main towns in the area are Burrel and Klos. The other communes situated in the watershed are: Martanesh, Xiber, Gurre, Komsi, Baz, Ulza, Kurdari, Lis, Derjan, Macukull and Rukaj; while two other communes are partially falling in the watershed: Selishte and Kthelle.

The total area of the Ulza watershed and is 122,434.94 ha (1,224.34 km^2). The Ulza Hydro Lake forms the central part of the watershed and the valley of the Mati river. The area gently decreases to this Mati river valley from about 500 m asl to about 80-120 m asl. The surrounding mountains forming the watershed reach to over 2000 m asl, with the highest peak of 2245 m asl.

The Ulza watershed area feeds the Ulza Hydro Power Plant (UHPP), which is located on the Mat River upstream from the mouth of the Fani River and near the villages of Ulza and Burrel. It is a 64 m high concrete gravity dam with a straight axis and an impounded volume of 240 mil m^3. The formed hydro lake (water reservoir) constructed in 1958 serves as a head source for the Mat river flow. The UHPP is privatized recently (during the study period).

For more information, please refer to: PUB_06-Description of Ulza Watershed Boundary, *'Description of Ulza watershed boundary',* Blinkov, I., Faculty of Forestry, Skopje, Republic of Macedonia under the WB-PROFOR SFM PES project, August 2013 and the MAP_Ulza *'Watershed Topography map'* under the WB-PROFOR SFM PES project, November 2012.

Erosion and land degradation is one of the main problems in the watershed, leading to downstream problems on landslides and flooding. A review is made on the occurrence of landslides and flooding in the area. For further information refer to: PUB_05-Occorrence of Landslides and Flooding, *'Occurrence of Landslides and Flooding, past and current',* Diava and CNVP, under WB-PROFOR SFM PES project, July 2013.

3.2 Environmental services: Reduced erosion and reduced sedimentation

The importance of reducing erosion and therefore sedimentation became very apparent through the Bathymetry measurements in the Hydropower reservoir. This study aimed at measuring the deposited sediment and calculating the quantity of accumulated sediment. For the bathymetry, echo-sounding was used in which 6 points per second were measured. In total this resulted in 360,000 measured points and 355,000 points after correction. Sedimentation turned out to be significant (23.3%) in the "operational storage" of the reservoir, decreasing its volume and functioning. Significant sedimentation of the operational storage started, cca 4 km from the dam upstream, while the larger part of the "dead storage" is already filled with sediment. Based on the calculations at least 31,5% of the total reservoir storage is filled with sediment.

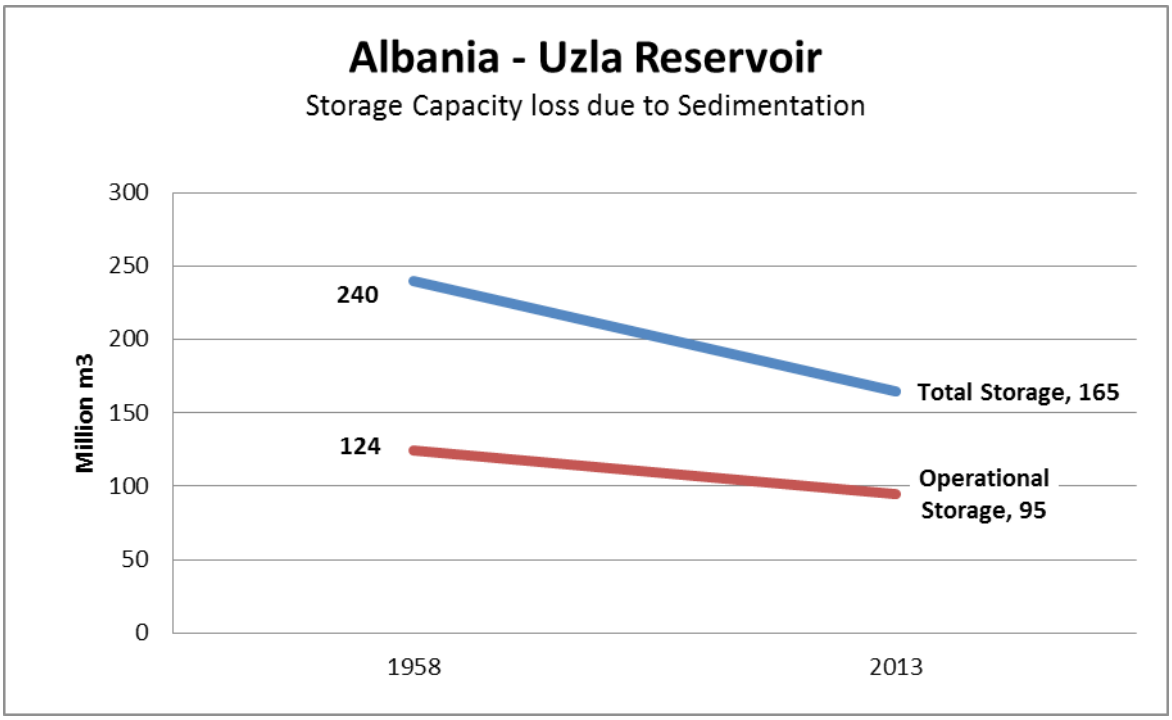


Figure 2: Level of reduced operation and total storage of the Ulza reservoir

The average annual quantity of sediment deposited is at least three times the average in the region. More of the future sediments will be deposited in the operational storage because significant part of the non-operational storage is filled. See figure 3 below.

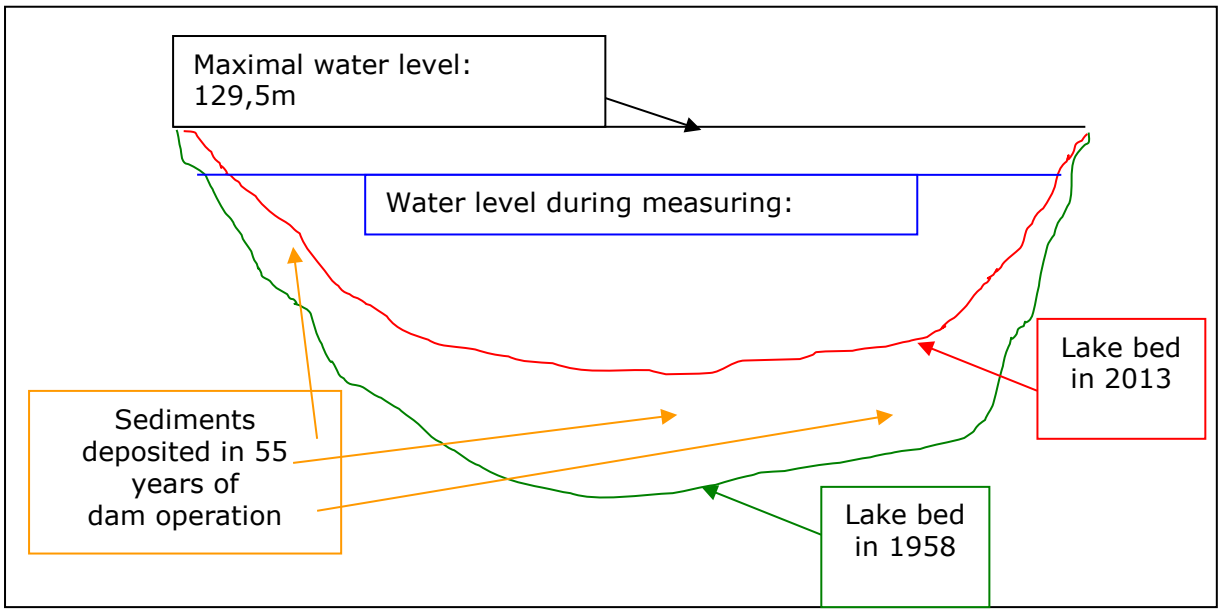
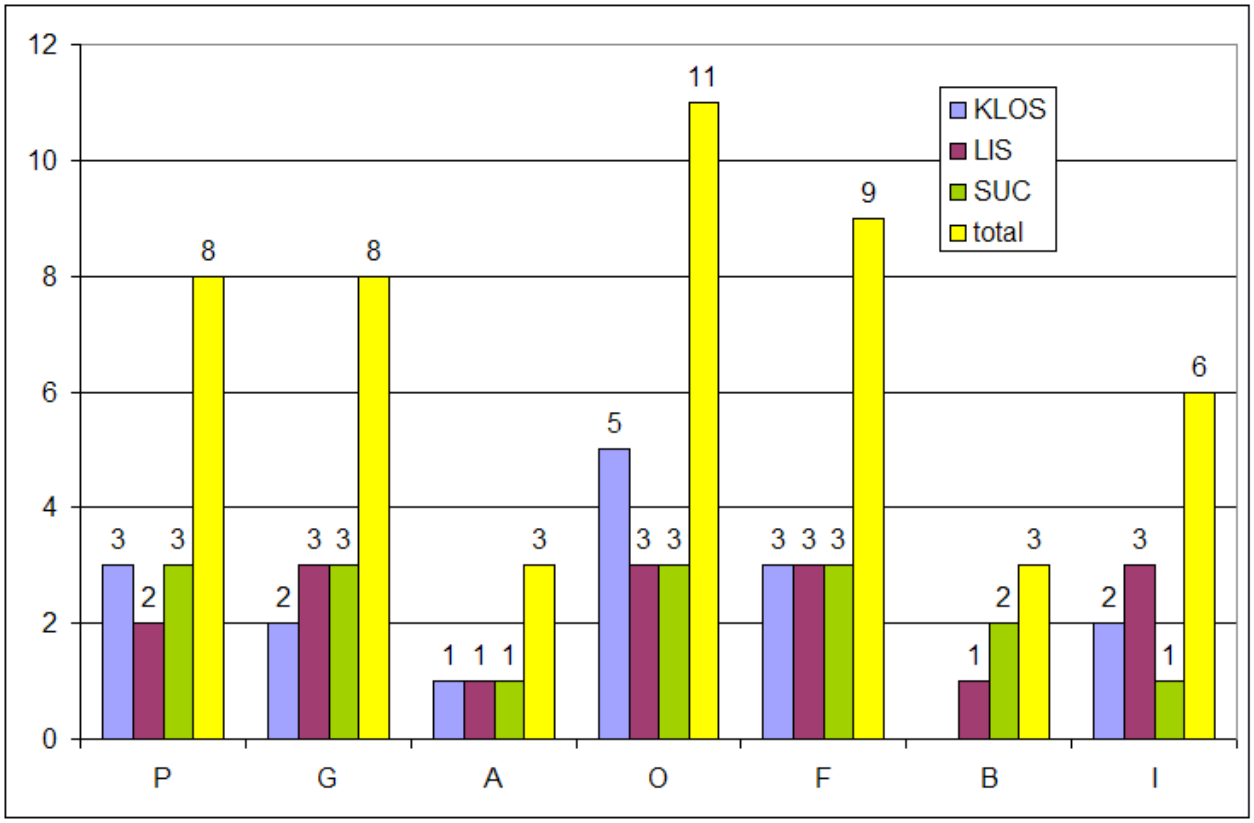


Figure 3: Overview of sedimentation in the UHPP reservoir

For more information, please refer to: PUB_07-Bathymetry and Lifespan Analysis, *'Ulza Reservoir Bathymetry and Lifespan Analysis',* Trendafilov A. and Mincev I., Faculty of Forestry, Skopje, Republic of Macedonia under the WB-PROFOR SFM PES project, August 2013.

It is possible to slow down the sedimentation in the hydropower reservoir by reducing erosion and run-off. In order to get better insights in good practices and land uses, a study was conducted on the correlation between precipitation, run-off and sedimentation in different land uses and slope categories. In this study 48 erosion plots (6 irregular shaped in areas with gullies) in different land use and slop conditions were regularly measured from 1 October 2012 until 31 Aug 2013.



P = Plantation (on meadow and young plantation), G = Grass land, A = Arable land,
O = Overgrazed grassland, F = Forest, B = Bare land, I = Irregular/Bare land

Figure 4: Distribution of plots by land cover/use

The land uses included represent the main land uses in the watershed, having the following descriptions:

F – Forest: these plots represent Oak forest with relatively good ground cover. Within the basin there are some other forest types as follow; beech forests, pine forest but they are located on higher elevation.

Figure 4a: Example of forest plot

G – Grassland: field cover with grass, not threaded by the owner, no grazing. These are areas used for hay production. Although farmers indicated that these areas were not grazed, practice showed that during the field measurements some grazing was made.

Figure 4b: Example of grassland plot

O – Overgrazed: grassland where grazing is allowed. This is the predominantly from of range land in the area. Most of the grazing is free grazing and herding with cow, sheep and goats. Grazing is whole year round in the lower altitude while the high pastures are used for grazing in the summer.

Figure 4c: Example of overgrazed grassland plot

Pm – Plantation mature: Orchard plantation where there is green ground cover. In the Ulza watershed increasingly farmers are involved in horticulture with a variety of fruit trees. In general these land uses have a good ground cover with grassland use for grazing or hay production.

Figure 4d: Example of mature plantation plot

Py – Plantation young: Young 2-3 year plantation on former bare land (trees are almost unnoticeable).These are in general plantations made with support of investments from projects with the aim of reforestation and erosion control.

Figure 4e: Example of young plantation plot

A – Arable land: classical arable land. Used for farming of agricultural crops such as maize, beans, potatoes etc.

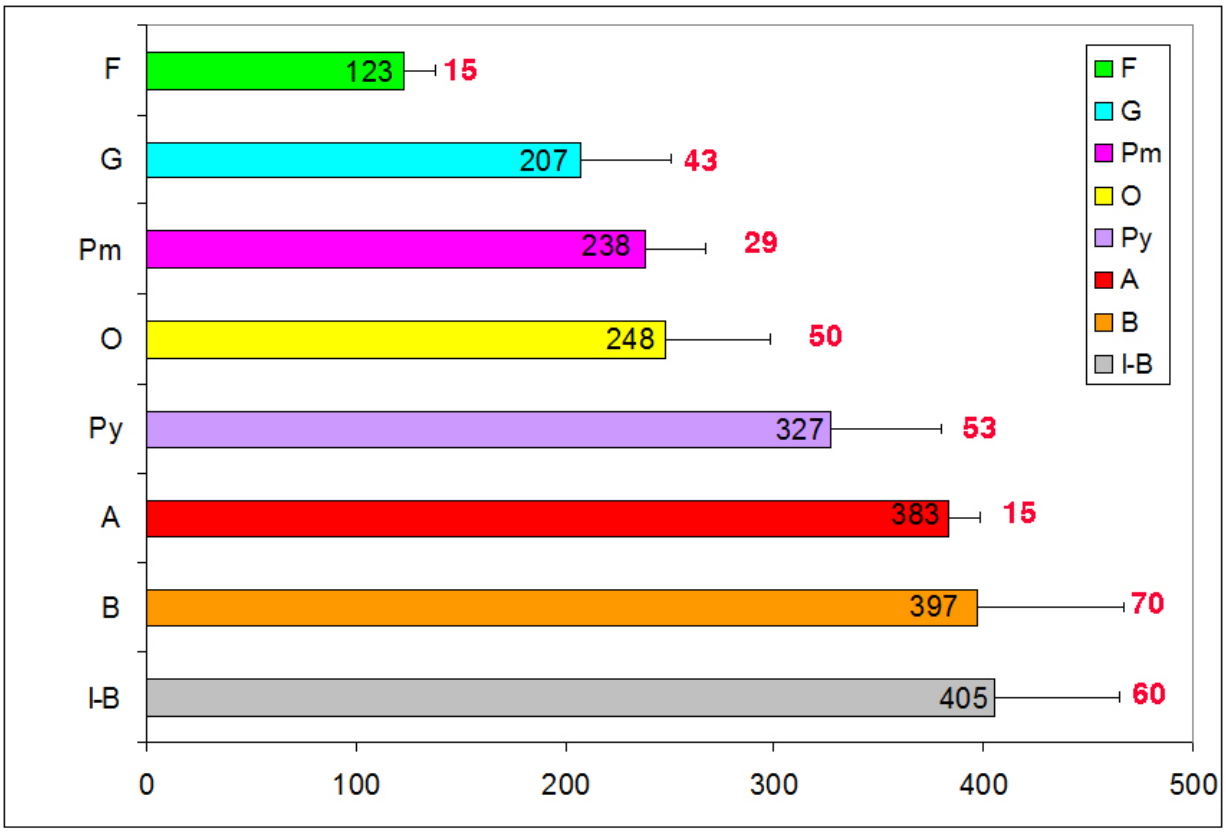
Figure 4f: Example of arable land plot

I-B – irregular shape plot/bare land: These are based in gullies with high erosion. Some having low ground cover, others transitional woodland cover.

Figure 4g: Example of irregular shaped plots, bare land

For further information on the methodology and experiences for erosion monitoring, please refer to: PUB_04-Report on Plots Establishment, *'Experts Report on methodology of establishment erosion control plots and social aspects of farmer selection and coaching',* Todorov V, Petrovski S and Kampen P., CNVP and Blinkov I., Forestry Faculty Skopje University, under the WB-PROFOR SFM PES project, January 2013 and PUB_11-Erosion Monitoring Ulza, *'Monitoring and modelling erosion and runoff in the Ulza sub-watershed',* Blinkov, I., Faculty of Forestry, Skopje, Republic of Macedonia under the WB-PROFOR SFM PES project, August, September 2013.

The study showed that erosion and sediment load are correlated to land uses. Land uses with the highest to the lowest erosion and sediment load are: Bare land/degraded area > Arable land> young plantation on bare land > Overgrazed land> Plantation on meadow > Planation with non-grazed meadow > Forest. Bare land has 3 times higher sediment load compared to forests. Furthermore, slope is a very important parameter that influences runoff and especially sediment yield on so called "open land" i.e. arable land, bare land and young plantation show increased erosion and run off with increased slopes. Slope is also an important factor in case of grasslands/meadow but less than in "open land' while in forest areas slope is not the crucial factor for run-off/sedimentation. Here, forest characteristics such as: crowns, surface florae, uneven surface, litter etc. have a higher influence and reduce the influence of slope.



F = forest, G = plantation with green cover, Pm = Plantation on meadow, O = Overgrazed meadow,
Py = Young Plantation on bare land, A = Arable land, B = Bare land, I-B = Bare land gullies
The absolute values are provided and the error (red)

Figure 5: Level of erosion per land use type

LCU	Number of plots per class	Slope of Plots [%]				Sediment load [dm^3]			
		from	to	mean	Error	from	to	**mean**	Error
I-B	5	26	60	40	8,32	302	483	405	60
B	3	15	28	23	5,11	301	466	397	70
A	3	20	75	12	14,49	309	462	383	15
Py	3	16	32	23	6,22	248	382	327	53
O	9	10	40	22	9,49	73	339	248	50
Pm	5	10	60	37	13,28	212	301	238	29
G	9	10	38	21	9,49	117	356	207	43
F	9	10	33	39	6,44	84	155	123	15

Figure 6: Level of erosion per land use type including slope and error

In general, land cover by forests is important in reducing erosion. Also ploughing on contour lines reduces run-off compared to ploughing cross contour lines. The results of the erosion monitoring can be used to provide recommendations on specific land use and land use practices in the watershed.

For more information, please refer to: PUB_11-Erosion Monitoring Ulza, *'Monitoring and modelling erosion and runoff in the Ulza sub-watershed',* Blinkov, I., Faculty of Forestry, Skopje, Republic of Macedonia under the WB-PROFOR SFM PES project, August, September 2013.

3.3 Forest management in Ulza watershed

In the previous paragraph, the importance of forest to reduce erosion and sedimentation came to light. This chapter gives more information on forest management in the Ulza watershed. Forest came out as one of the most suitable land uses to reduce erosion. This however works two ways, it reduces erosion in case of sustainable forest management with sufficient cover, and it dramatically increases erosion when forests are degraded and over-exploited. This land use is therefore reviewed in more detail, since it will provide good options to sustainable upland management in the watershed. Forests are the most important land use in the Ulza watershed; refer MAP-*'Ulza Watershed land cover map',* under the WB-PROFOR SFM PES project, November 2012.

Oak dominates in the central parts of the catchment (40%), followed by beech (32%). Of the conifer tree species, the most abundant is black pine (11%); Most of the forests, or 79.4% are of mixed composition (53,175 ha); 20.6% (13,773 ha) are monoculture forests with one dominant species. If the forests[4]are categorized by productivity, 3.5% of the forest can be considered as highly productive, 51.1% medium and 45.4% low. Communal forests are located at lower altitudes. These forests are in general now well protected and regenerating after a long period of degradation and over grazing. State forests are located at higher altitudes; where over-exploitation and illegal logging occurs.

The present forest management could be improved in the following ways, depending on the stand:

- In pure high forests: shelter wood system.
- In coppice oak forests and other forests of deciduous species: shelter wood system and selective cutting;
- In young oak forests: cleaning and thinning
- In low forests (mainly Communal Forest areas): farmer forestry is recommended (Multi-function, multi-objectives, multi-species, multi-structured (layers), adaptable to changing needs & requirements); here also coppiced forest management could be undertaken as coppiced forests with small coppice strips
- In high forests a period of regeneration and protection is needed

Approximately 1500 ha of degraded land of Refused Lands in the catchment of the "Ulza" reservoir is planned for Afforestation & Reforestation as part of the Albanian BioCarbon Fund Project (2007-2018).

For more information on the forests of Ulza watershed and its management, please refer to: PUB_14-Forest Practices, *'Forest Practices in the Ulza Watershed',* Trendafilov, A, Blinkov, I., Mincev, I., Faculty of Forestry, Skopje, Republic of Macedonia and Omuri, I, CNVP under the WB-PROFOR SFM PES project, August 2013.

3.4 Perceptions of stakeholders on Environmental Services

Apart from studies on the technical details on erosion, sedimentation and forest management as described in the previous parts, the views and perceptions of stakeholders on environmental services is at least as important. Therefore s study was conducted 1) To assess perceptions/views of both upstream and downstream stakeholders on land use practices upstream that affect stakeholders downstream, and 2) To get insights in the perceptions of downstream stakeholders; (I) on the occurrence of erosion and flooding and (II) on their willingness to pay for ES. The study involved 100 questionnaires for downstream stakeholders and 110 questionnaires for upstream stakeholders. See figure 5 below.

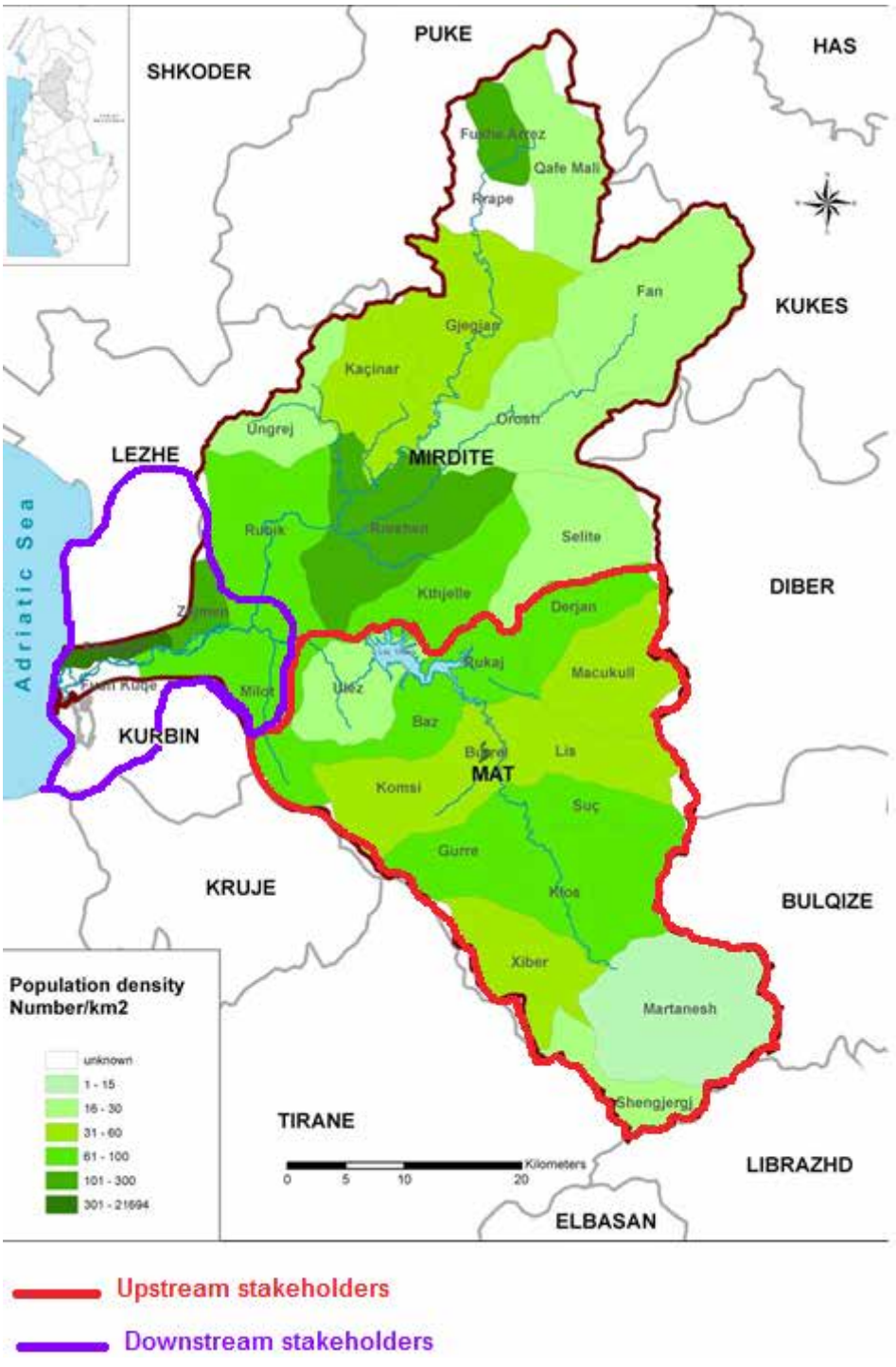


Figure 7: Location of the upstream and downstream stakeholders interviewed (area in green is the entire Mat basin; area circled in red forms the Ulza watershed)

Main uses of water downstream are: 1) consumption and irrigation by farmers, 2) hydropower generation by UHPP and 3) washing gravel and sand by extraction and processing companies of raw materials in the Mati river bed. More than 85% of the downstream stakeholders regard variations in water flow and reduced seasonal flows as main problems. Downstream stakeholders believe that deforestation, forest fires, gravel

extraction activities in the watershed and river bed, and grazing of livestock in forests are the main causes for undermining hydro regimes and accelerating erosion. Around 98% of the people interviewed downstream stated that there is a connection between erosion in Ulza's upstream watershed and water problems happening downstream; while 88% of the upstream believe there is a correlation between natural resources management upstream and (negative or positive) impacts downstream. Furthermore, 60% of the upstream respondents believe that private communal forests are in very good condition, 68% think that common used communal forests are in average condition while 60% believe the state forests are in poor or degraded conditions. Almost all stakeholders think that a PES scheme for Ulza watershed would be essential to maintain/safeguard ES with the Government as main contributor for PES. Around 12% of interviewed stakeholders are willing to pay for environmental services such as reduced erosion and reduced sedimentation.

For more information please refer to: PUB_16-Stakeholder analysis, *'Ulza Downstream and Upstream Stakeholder Analysis',* Diava, CNVP, under the WB-PROFOR SFM PES project, 2013.

3.5 Potential PES schemes in Ulza watershed

In this final part on the Ulza watershed case, potential PES schemes for the Ulza watershed are explored. The former chapters have shown that there is substantial erosion, run-off and sedimentation of the reservoir in the watershed which could be reduced by sustainable forest and pasture management practices. Upland farmers could thus be compensated for changes in land use or maintaining good practices such as: sustainable forest management, reforestation/ afforestation, sustainable pasture management, and/ or sustainable agriculture on erosion sensitive areas in critical watersheds leading to reduced erosion and reduced sedimentation. The Government, local government, Ulza Hydropower Plant, other companies using large quantities of water, and other downstream users (such as farmers) are all beneficiaries of the environmental services and could potentially pay for these. The height of the compensation or the payment would have to cover the costs of the upland farmer to enter the PES deal. These costs refer to the costs and investments for land resource management changes, opportunity costs and transaction costs. For the buyer the price has to be lower than the value.

Three major PES options seem feasible for Ulza watershed:

- Option 1: This option is a ***Government-led scheme***, in which UHPP is taxed or electricity generated by UHPP is taxed, with the generated revenues used as subsidy for upland farmers for financing sustainable forest and pasture management practices
- Option 2: This option refers to an ***user-led PES scheme***, in which ***UHPP*** directly pays (or through the Forest and Pastures Users' Association (FPUA) as intermediary) upland farmers for sustainable forest and pasture management practices. Because the watershed covers a large area, the PES scheme under this option could start small with some upland farmers living in the most critical areas. If proven successful, the scheme could be further up-scaled based on lessons learnt.
- Option 3: Another option is the set-up of ***Water Funds***. These funds can be generated by payments and donations from the private sector, government, associations, donors and others. The Water Fund could be managed by a board representing the different stakeholder groups and they will decide on payments for activities leading to enhanced environmental services. These activities could be in the form of small projects and/ or direct compensation for upland farmers.

Option 2 seems the preferred option as UHPP is the major beneficiary of ES but depending on the interest and willingness of UHPP to be involved in such a scheme. In case UHPP is not interested, the establishment of a Water Fund might be more feasible.

A PES scheme will involve many different stakeholders each having their own role and responsibilities. In a PES scheme for Ulza watershed, these could for example be:

- Upland farmers as providers and guardians of environmental services through applying sustainable forest and pasture management practices
- Government/local government, UHPP, other companies using large quantities of water, and other downstream users as buyers of ES and providing payments for enhancing environmental services
- FPUAs could have an intermediary role and represent the upland farmers
- Regional and Local governments and Forest Service could play a role in the verification and compliance monitoring related to the PES agreement
- University/Regional Federation have an important role in monitoring the effectiveness and efficiency of the PES deal (erosion plots, bathymetry measurements)
- A project/ program could help in carrying out further surveys to inform a potential PES scheme, facilitating negotiations between different stakeholders to enter in a PES deal, and capacity building of involved stakeholders. As PES for watershed protection is new to Albania.

For the further development of a potential PES scheme the following next steps are of importance: Further surveys to inform a potential PES deal, including 1) an economic analysis of the benefits and costs of PES compared to alternatives for UHPP, 2) identifying and assessing critical watershed areas within Ulza watershed; 3) Identifying providers/ guardians of ES; 4) Identifying details of sustainable forest and pasture management practices and related costs (what, where, how and (opportunity) costs); 4) Identifying and assessing potential buyers of ES; 5) Preparation of PES program/ project to facilitate surveys, facilitate design and negotiation of PES deal and capacity building.

For more information, please refer to: PUB_09-PES Scheme in Ulza, *'Designing Potential Payment for Environmental Services (PES) schemes for watershed protection in Ulza, Albania',* Marianne Meijboom and Peter Kampen, CNVP under the WB-PROFOR SFM PES project, August 2013.

4. Potential PES schemes for energy efficiency from wood biomass in Kosovo

4.1 Background

Kosovo

Kosovo is situated in the Balkan Peninsula and is surrounded by Albania, Macedonia, Serbia and Montenegro. Currently, Kosovo is divided into 37 municipalities and circa 1,298 villages. The geographical basin of Kosovo covers in total an area of 10,840 square kilometers at an altitude between 500 - 600 m and is surrounded by mountains and divided by a central north-south ridge into two regions.

Forest area and management

According to a country-wide forest inventory of 2003-2004[2], the forest land area in Kosovo is 464.800 ha, of which 278.880 ha are classified as public forestlands and 185.920 ha as private forestlands.

The Ministry of Agriculture, Forestry and Rural Development (MAFRD) is the highest authority in charge of forestry. At central level it has two main forestry branches – the Kosovo Forest Agency (KFA) and the Department of Forestry (DOF). KFA has four central Directorates (Directorate for Forest Management, Directorate for Pasture Management, Wild Animals, Hunting and Ecotourism, Directorate for Silviculture, Research and Seedling production and Directorate for Administration). Six Regional Offices exist which coordinate and support forest activities through municipal units, where one of the main tasks is to cooperate with local governments (municipalities). Private forest owners are increasingly organized in associations at municipal level (16 with 2 in process) with a national umbrella association.

Kosovo's forest management suffers from weak forest management planning capacity and weak multiple use orientation. According to the last national inventory data (FAO-2003), around 40% of public forestlands and 29% of private forestlands have been subject to uncontrolled or illegal harvesting activities. The main reasons for forest resources depletion are as follows:

- High demand for firewood and construction wood fulfilled in illegal way;
- Mismanagement of coppice forest;
- Poor enforcement of policy and strategy for sustainable forest management;
- Un-flexible administrative instructions not allowing proper silvicultural treatment on coppice forests spatially;

The most significant obstacles to a viable forest products sector in Kosovo is inadequate forest planning and management, which undermines needed investment in conversion technology.

2 - Currently a new forest inventory is undertaken, the field data collection and processing has been completed, but official data and analysis have not been released yet (September 2013)

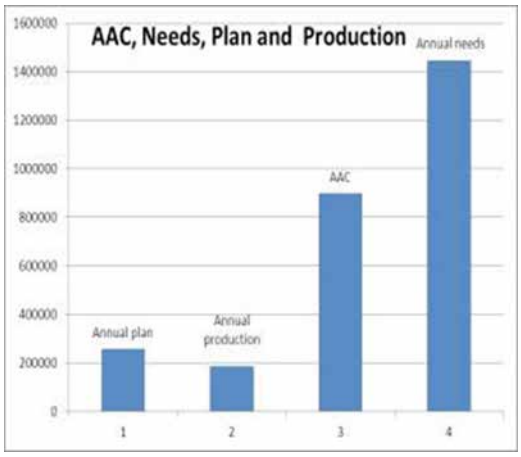


Figure 8: Actual harvest compared to planned, AAC and needs

The mean annual increment on areas surveyed in the forest inventory is 3.0 m3 per ha per year, which is very low considering the soil and climate conditions. Legally produced wood is less than 200,000 m^3, which is four times lower than the national Annual Allowable Cut (AAC) of 900,000 m^3. Most (over 85%) of the wood production is firewood.

There are certainly great potentials for increased wood production through better management of existing forests.

Kosovo's overall energy situation

Approximately 98% of electricity power generated within Kosovo is from two lignite coal-fired thermal power plants with an annual gross generation of 5041 GWh. In Kosovo, lignite mining and the production of electricity from this source in old and inefficient thermal power plants are heavily polluting. Emissions of toxic gases and particulate matter in the areas around power stations and lignite mines are at levels that would be unacceptable under EC regulations, and air quality is poor. Electricity is used for space heating as well (37%) but wood biomass (61%) is the main source for space heating.

The gap between demand and supply of energy could be bridged by renewable energy sources, in order to avoid the reliance on thermo power plants and on import. Potential of wood biomass and sustainability are not fully addressed.

Wood biomass consumption

Firewood is used all over Kosovo. In rural households firewood is used at higher levels and seems to be used more or less all year around, while in urban households mostly during the colder period (November – March). There are no data available on the exact firewood consumption and supply. However there are several studies made based on which an good estimation can be made. Some of those are based on assumed average volume of firewood being used per household multiplied by an assumed number of households using firewood. Depending on values used, these estimations range from 600,000 m^3 to more than 2,000,000 m^3 per household (Jacobson 2003), which are much higher than the legal production of 200,000 m^3.

The Human Development Report on Energy for Development (UNDP Kosovo 2007) has identified firewood as the main source of heating by 80 percent of households, with electric heating being the main source for 12 percent. Coal is also used for heating, mostly in schools and houses in rural areas.

Building energy efficiency situation in Kosovo

In Kosovo more than 50 % of houses are more than 40 years old. Of these houses only 10% are thermo insulated while 60% of new buildings (after 1999) are thermo insolated.
Most households in Kosovo rely on individual household heating devices for space heating, water heating, and cooking. These devices use variously, electricity, firewood, gas or oil. Wood burning stoves, used for both cooking and space heating, are among the most commonly owned durable household goods in Kosovo. The majority of people heat only one room in winter, but less than half of the households had invested in basic thermal insulation of their homes, which would avoid substantial wastage of the energy consumed.

Energy policy and strategy related to renewable energy

There are a number of strategies and policies of importance related to renewable energy, including the following:

- The reviewed energy strategy of Kosovo 2009-2018
- The Law on Energy (2004),
- The Law on Energy Regulator (2004/9) under which the fully independent Energy Office (ERO) was established
- Energy Community Treaty (EnCT) (October 2005); The EnCT foresees that until 2015 Kosovo should fulfill 10-12% of its electricity energy needs from renewable sources.
- Decision No 05/250 "Incentive measures for generation of electricity from renewable energy sources and co-generation in Kosovo for the period 2007-13" (2007)
- Plan for Implementation of the Acquis on Renewables (May 2008) prepared to comply with the requirements of the "Treaty for the Energy Community in South East Europe" and focuses on two European Directives:
  - Directive 2001/77/EC, on the promotion of electricity produced from renewable energy sources in the internal electricity markets, and
  - Directive 2003/30/EC, on the promotion of the use of bio-fuels or other renewable fuels for transport.

The Ministry of Energy and Mining (MEM) has determined indicative targets of renewable energy resources to be integrated into the Kosovo power grid through the Governmental Program for Clean and Efficient Energy. The program has presented a basic scenario which includes expanded hydro resources, wind, biomass and solar photo-voltaic. The development of biomass and urban waste fuelled power plants is envisaged to start in 2012, with progressive capacity development reaching 16.5MW by 2020. The use of wood biomass as a source for space heating is not considered specifically.

Obstacles for farmer investment in RE

Farmers face a number of challenges in investing in renewable energy, although farming community, farmers associations and different farmer organizations are fully aware for positive impact of development

of renewable energy sector in terms of additional incomes in their farms and the development of the sector. Farmers in Kosovo are not investing a lot in treatments of hedgerows or planting short rotation coppice as important source of RE wood biomass for two major main reasons: 1) the agriculture sector is characterized with low profitability and low access to financial funds which results in low investments in farms and low incomes for farmers. Kosovo farmers therefore lack financial capabilities (at least for the time being) to invest in renewable energy sector; 2) Lack of policy incentives from government or other institutions in order to support the RE sector. There is no direct financial support for farmers for investment in renewable energy sector (as for example exist in fruit tree vineyard or livestock scheme).

Studies for potential PES schemes for energy efficiency from wood biomass in Kosovo

As can be concluded from the description of the context in Kosovo, biomass has high potential for the generation of renewable energy. Not used wood materials, such as low-quality and/or small-diameter trees, waste from illegal loggings or residues after forest operations on harvesting, short rotation agroforestry trees, and sawmill residues (bark, sawdust) form a high potential for wood biomass processing into wood chips, briquettes or pellets in order to contribute in filling the gap between demand and supply of wood products, while increasing renewable energy and reducing forest illegal logging.

Renewable energy is a relatively new concept and practice in Kosovo. However, renewable energy coming from biomass is foreseen to substitute electrical energy used for heating generated from fossil fuels which have negative environmental impact such as: emission of greenhouse gases and other pollutants.

In order to get more insights in the modalities of potential PES schemes for energy efficiency from wood biomass in Kosovo, a number of studies were commissioned under this project. The results of these studies are described in the next chapters: Potential wood biomass production (4.2), Forest management practices for increased wood biomass production (4.3), Wood biomass consumption and processing (4.4), Energy efficiency and wood biomass use for heating (4.5), and PES opportunities on energy efficiency (4.6).

4.2 Potential wood biomass production

Forests are important for Kosovo and form the main source for firewood production which is mainly needed for heating and to lesser extend cooking (the latter mainly in rural areas). There is no exact and clear figure on the total amounts of firewood (wood biomass) used in Kosovo and the actual amounts of wood biomass production from forests in Kosovo.

Based on several studies and assessment the demand and current fuel wood consumption demand is in the range of 1.2 to 1.5 million m^3 stacked wood. The average consumption of firewood is assessed on 7-12 m^3 per household and 60-70% of 295,070 households using firewood.

The average annual production is about 180,000 m^3 legally harvested, while the annual allowable cut is 900,000 m^3 for the forests in Kosovo (based on National Forest Inventory 2005). The production from agroforestry is not included in this allowable cut. Import is mainly for timber, the amounts of firewood imported are limited. This shows a huge gap between official recorded wood biomass production and the actual demand. The

illegal and informally harvested amounts for firewood are estimated over 1 million m^3.

This large gap between legally wood biomass production and wood demand leads to increased uncontrolled and illegal harvesting and unsustainable forest management. Most of legally produced fire wood in Kosovo comes from private forest (76 % or 134 900 m^3 comes from private forest, while 24 % or 41,700 m^3 from publicly owned forest).

It is clear however that based on the actual consumption much more firewood is produced each year. In assessment of the over 1 million m3 firewood unofficially harvested wood there are more several sources:

- Private forests
- Public forests
- Agroforestry

Actual forest production from private forests is estimated to over 460.000 m^3 per year which is about 330.000 m^3 more than the official figures. The estimates of illegal harvested firewood are about 550.000 m^3. The amounts coming for agroforestry are unknown. Assessments made in two municipalities indicate that agroforestry is contributing with considerable amounts of wood biomass. A rough indication can be that the total area with trees under agroforestry in agricultural land varies from 45.000 – 90.000 ha. Using an estimated harvest of 3 m^3/ha/year would 135.000 – 270.000 m^3.

Compared with the estimated demand of 1.2 – 1.5 m^3 stacked wood, the limited amounts of firewood import and share of only 5% of produced timber wood this can be regarded as sufficient reliable estimates. The issue then becomes how to change the illegal harvest in to sustainable and regulated harvest and improve the production.

Source	Rounded figures (m^3)
Public forest legal	40,000
Public forest illegal	550,000
Private forest legal	130,000
Private forest unofficial	330,000
Agroforestry	200,000
Total	**1,250,000**

Table 1: summary of wood biomass produced in Kosovo

The planning and realisation of planned harvest must improve. Additional effort is needed to increase the realised harvest from regular planning within the annual allowable cut (compare current harvest of 175.000 m^3 and AAC of 900.000 m^3). Besides this further options to realise wood biomass production are from:

- Using wood residues (after regular harvest or after illegal harvest)
- Pre-commercial thinning of mainly beech forests
- Putting degrade coppice forest under management
- Agroforestry improved production

The amount from wood residues is assessed can be about 330,000 m^3 annually. The pre-commercial thinning if the dense young forests in are included in the planning and will be treated in the coming years produce annually 180,000 m^3. Wood biomass production from the degraded coppice forest when taken under coppice

management is estimated to 130,000 m^3. Agroforestry is currently neglected. This needs further review on the actual production and provide recommendations on improved production, amongst other to enrichment of existing agroforestry and application of fast growing species.

Implementation of these option lead to increased productivity and economic value of forests leading to increased incomes for rural population. There is a need to improve the forest structure in quality and quantity. This will reduce illegal logging and increase sustainable legal wood biomass production.

For further information refer to: PUB_17-Wood biomass potential, *'Analysis on production, current and potential for wood biomass, from public and private forests and agricultural land in Kosovo',* Ergin Hajridini, NRS and Peter Kampen, CNVP, under the WB-PROFOR SFM PES project, 2013.

4.3 Forest management practices for increased wood biomass production

The study on forest management practices for increased wood biomass production focused on three objectives: 1) to assess the actual forest management practices and their impact on production potential of forest biomass; 2) to analyze the legal, technical and social limitations; and 3) to provide recommendations on forest management practices to increase the forestry production potential to provide benefits through sustainable development of forest and biomass.

Forest management practices are realised through silvicultural systems, which include three basic components: 1) regeneration, 2) stand tending and 3) harvesting. In most countries these systems are described in a national forest management code, but Kosovo does not have such a code, nor regulated standards enabled by the code. The national forest regulations do not have specifications related to the silvicutural regimes and there are also no guidelines for rehabilitation of degraded forests. However, there are guidelines on forest management systems and practices approved by KFA in 2009. These guidelines describe 88 different management classes but these do not include degraded coppiced forests while about 30% of Kosovo's forests consist of degraded coppiced forest.

The Policy and Strategy Paper on Forest Sector Development approved in March 2010 states that joint forest management systems in low forest (a.o. coppice forest) shall be supported where the main product is firewood in order to reduce the extent of illegal activities. The operational planning over such areas shall also take into consideration the expected needs for forest wood products. However, till date no progress has been made in joint forest management, nor investments, in coppice forest related to planning and implementation.

According to outcomes of 5 different studies, the annual wood quantity harvested from forests is estimated to range between 1.2 to 1,5 million m^3 with 95% used for firewood. Only 14% of the wood harvesting is recorded and the remaining 86% is defined as un-recorded harvesting.

There are several options to increase wood biomass production using different forest management practices:

- Coppice forest management using strips or small harvest areas over a longer period
- Pre-commercial thinning of young Beech forests
- Stimulating agroforestry practices

Coppice forests are an important part of Kosovo's forests and the majority of those are degraded. These forests are neglected and outside of regular forest management, suffering from uncontrolled harvest via negative selection further degrading the coppice forests.

There is a high difference between private and public coppice forests. In general the private coppice is having a much higher production.

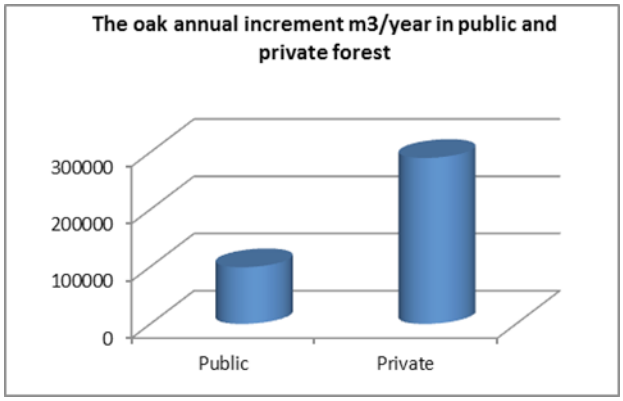


Figure 9: Annual increment m³/ha/year on oak forest private (74.6%) and public (25.4%) forest

Coppice forests management through small strips or coupes form a good opportunity. To bring the degraded coppice forest under management, increase production and reduce illegal logging.

Ownership		**Private forest**		**State forest**	
Silvicultural regime		**Low forest**	**Low forest**	**Low forest**	**Low forest**
Management practice		**Coppicing**	**Coppicing**	**Illegal Thinning**	**Illegal Thinning**
Growing stock m^3 /hectare	**m^3**	**410.8**	**151.1**	**31.6**	**59**
Annual Increment m^3/hectare	**m^3**	**11.4**	**10.8**	**1.3**	**3.5**

Table 2: Results of sample plots comparing private with State coppice forests

Private coppice forests managed with small harvest areas indicate high growing stocks and annual increment. State forests are recommended to coppice management with strips, which also provide good opportunities for joint management with involvement of the rural community, supplying wood biomass for their needs and contributing to reducing illegal logging.

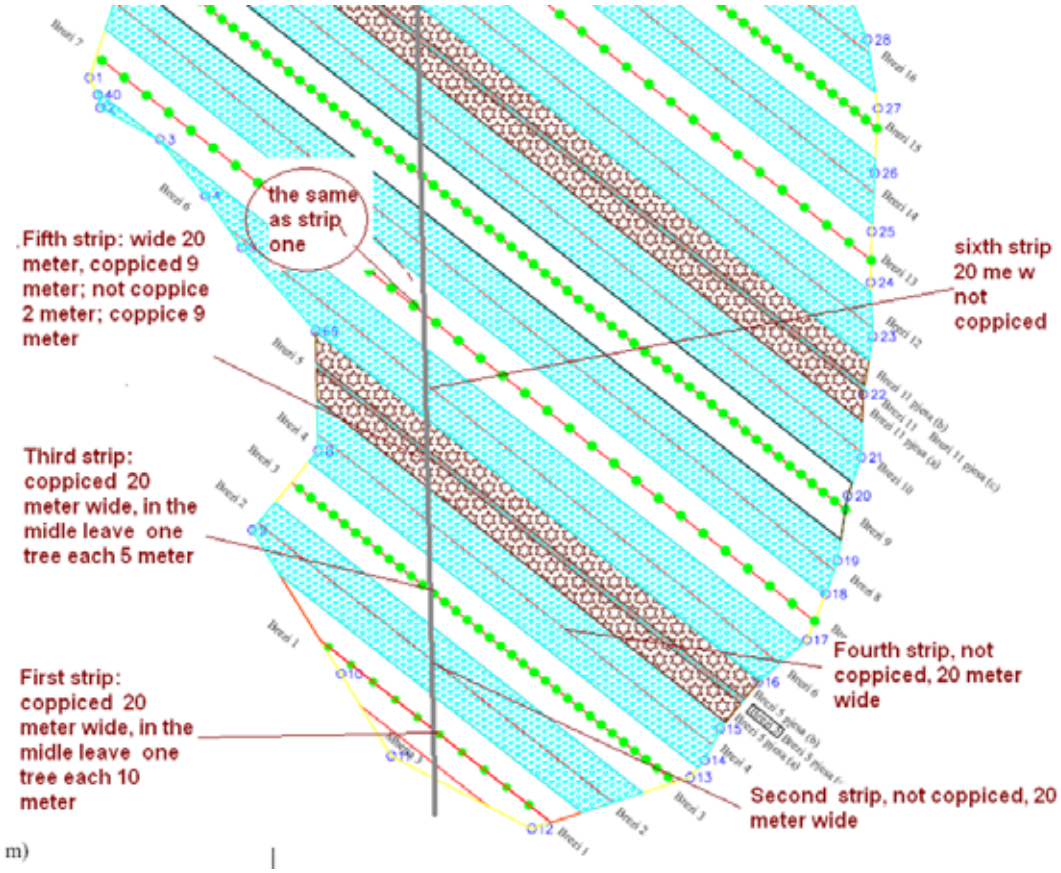


Figure 10: Example of forests management with different strip harvest regimes

Beech forests form the most important forest type in Kosovo (171,000 ha). Most of these forests are young dense forests (about 88,000 ha) that have not received silvicultural treatment in the past period and in high need for intervention providing space to the growing stock and stimulating growth. Introducing structural planning for pre-commercial thinning of these young forests with annually 8-10,000 ha can provide annual biomass production of about 180,000 m^3.

Figure 11: Agroforestry practices in Kosovo

Agroforestry is important in providing products (especially wood biomass) and ecological services. Farmers have incorporated this in their systems, using traditional knowledge. The forestry and agricultural sector is however neglecting agroforestry and no specific data or knowledge is available for agroforestry production and practices.

Good opportunities exist to further invest and stimulate agroforestry practices and further increasing wood biomass production, for example through improvement of existing agroforestry sites and introducing fast growing species.

Figure 12: Two year old fast growing Salix species in agroforestry

For further information refer to: PUB_15-Forest practices Kosovo, *'Forest Management Practices, supporting wood biomass production',* Haki Kola, CNVP, under the WB-PROFOR SFM PES project, 2013.

4.4 Wood biomass consumption and processing

This study aimed to get insights in the wood biomass consumption and processing of wood biomass. The study included a household survey and wood biomass value chain analysis. Several studies estimate that 60%-70% of all households use fuel wood and consume a total of 1.2 – 1.5 million m^3 per year. For space heating biomass is mostly used (61%) followed by electricity (37%). Almost all biomass used by households is derived from firewood (89.5%) followed by charcoal (6.9%). Pellets, briquettes, other solid fuels and other types of biofuel are hardly used and make up the remaining 3.6%; respectively by 0.9%, 1.6%, 0.9% and 0.2%.

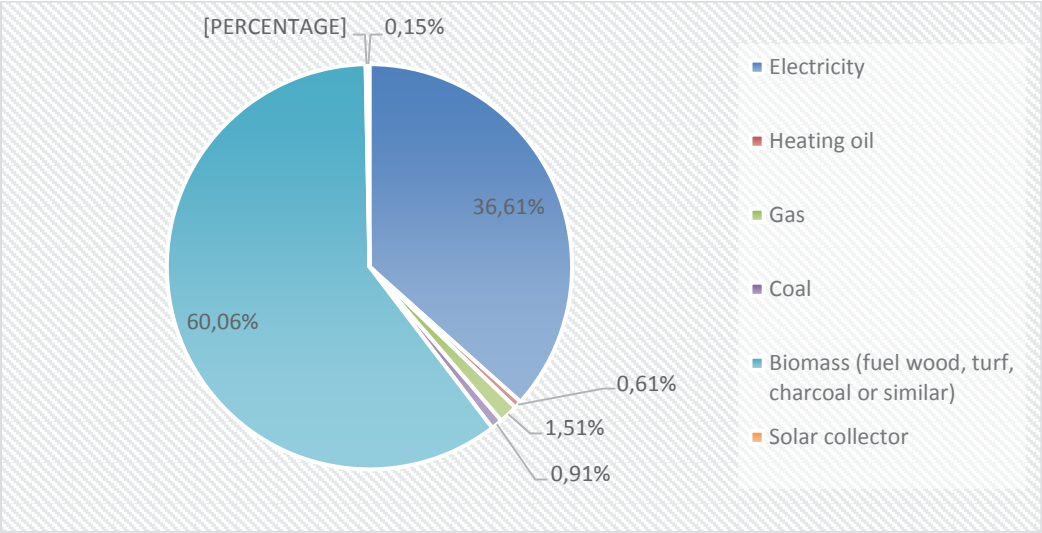


Figure 13: Energy sources used by household in Kosovo for space heating

There are a number of processing technologies for using wood waste materials, such as: wood chipping, briquettes and, pellets. Wood chipping is yet an unknown technology in Kosovo. Briquettes are more frequently used, while pellets are developing fast. Both briquettes and pellets are locally produced. However, pellets are mainly produced for export, while the domestic market is developing slowly but gradually. Production of these wood biomass products are of different quality. There is a need for standards and quality control. The whole value chain for wood biomass is very informal and unorganised. Almost all of the firewood is sold informally and uncontrolled.

Figure 14: Informal firewood selling in Kosovo

Regarding the efficiency of biomass, open fires are the most inefficient (efficiency rate of up to 10%), followed by traditional cooking stoves (efficiency 10-15%). Modern pellet-boilers can reach up an efficiency of 90%. Households most commonly use traditional wood stoves. Wood biomass district heating does not yet exist in Kosovo.

Wood biomass processing is potentially commercially interesting. Farmers, private forest owners could set up associations or cooperatives and sell a variety of wood biomass products for heat energy production. Wood biomass products could be used at individual level (households or buildings) as well as district heating. Another option is combined heat and power production (CHP) using biomass or co-combustion for energy production. In the latter case the heating system uses e.g. coals supplemented with biomass.

Figure 15: Wood chips are currently unused in Kosovo, but a good option for heating systems

Investment and support is needed for the whole wood biomass value chain. Policy support is required for the further development and promotion of sustainable forest management producing wood biomass, wood biomass processing in relation to the wood biomass market, and technology development for improved energy efficiency. For the wood biomass market a long-term policy vision is required with incentives and subsidies to reduce investment costs for end-users and access to energy markets for all biomass technologies (including connection to the grid, standardisation, etc.). Changes in forest policy are needed to ensure a long-term and sustainable supply of wood biomass, while energy policies need to stimulate the use of wood biomass and could involve subsidies for efficient small-scale biomass boilers, biomass based district heating systems and biomass CHP (feed-in tariffs, etc.).

For further information refer to: PUB_13-Wood biomass Consumption Household survey, '*Study on firewood and other wood biomass use by population, Household Survey',* Tina Opalic and Luka Safar, REGEA, Sasho Petrovski, Haki Kola and Peter Kampen, CNVP, under the WB-PROFOR SFM PES project summer 2013.

And refer to: PUB_12-Wood Biomass Value Chain, '*Analysis of biomass supply chain, production and utilisation of wood biomass for Energy Production',* Julije Domac, REGEA and Sasho Petrovski, CNVP, under the WB-PROFOR SFM PES project, April-September 2013.

4.5 Energy efficiency and wood biomass use for heating

The study on energy efficiency and wood biomass use for heating has been assessing three cases to look at the feasibility of investments in modern biomass heating system. Three different buildings were assessed: 1) Junik Primary school, 2) Peja Public health centre, and 3) a private house in Rastavic village.

Junik Primary school consists of two buildings with an overall floor area of 2,600 m^2. For space heating an old central firewood boiler is used with a capacity of 400 kW. There is no heat insulation at the school. Energy

efficiency could be improved by installing heat insulation of 10 cm thick on exterior walls and roofs, which would result in 55% decreased heat energy consumption. The old firewood stove could be replaced with a new central heating system with woodchip boiler with a heat power capacity of 160 kW (based on the actual needs after insulation). Total costs for these investments are: 185,707 € (with thermal insulation costing 164,507 €). The current annual fuel expenses are 9,100 €, while after insulations and use of woodchip boiler this amount will be reduced to 1,875 €, resulting thus in fuel savings of 7,225 € per year. With a simple calculation this means that it would take 24,7 years to payback the investments. Making this investment less interesting from a financial perspective, but could still be considered from an environmental and social perspective.

Peja public health centre has an overall floor area of 2,700 m^2 and uses a diesel stove (heat power 240 kW) for space heating. The centre is insulated and has 8 cm heat insulation on exterior walls and roof. In this building energy efficiency could be improved by installing a new central heating system with a pellet boiler with a capacity of 230 kW. A pellet boiler is recommended because there is insufficient space to construct a heating system based on woodchips (pellet boilers need less space than woodchip boilers) at the health centre.

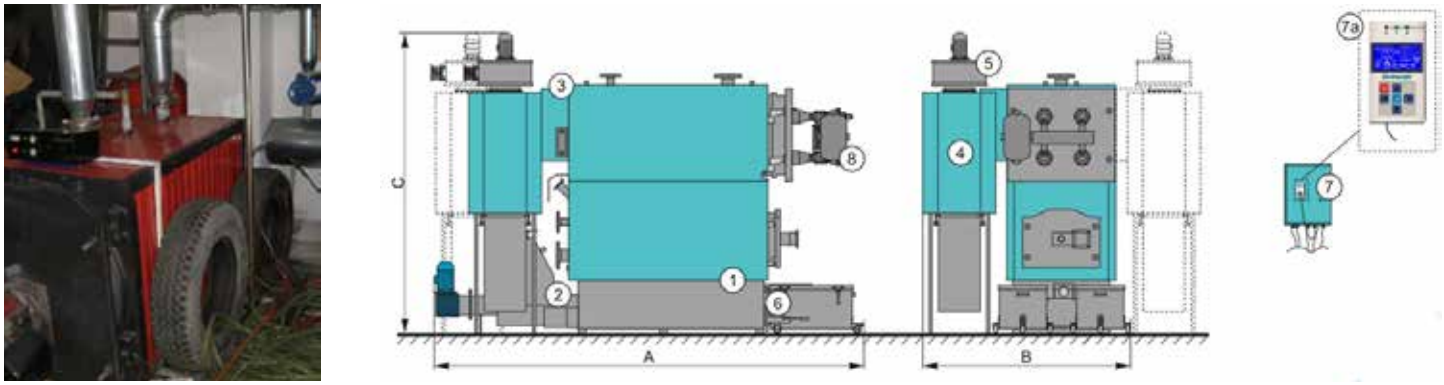


Figure 16: Current diesel run heating boiler that can be replaced by wood pellet boiler

Investment costs for the pellet boiler are 13,800 €. The reported annual diesel fuel expenses are at present 197,640 €. After energy efficiency improvements, the expected annual expenses are 5,531 € using the pellet boiler. This means that annual fuel savings could be as high as 192,109 € and the payback period for the investments 0,04 year. However, the reported diesel expenses for this size of building are not realistic and there might be some improper use of diesel. The estimated consumption of diesel for such a building (size) and required temperature is projected to cost 25,620 € per year. With the same investment, this would mean a payback period of 0,69 year. This makes the investment from financial perspective very attractive while it will also address environmental and social benefits.

Households in Kosovo reported through the survey to spend about 10-11 m^3 on average with a costs of about 350 €/season.

Winter season	Average consumption of firewood expressed in m^3	Average cost of firewood for heating in winter season expressed in €	Average unite price of firewood expressed in €/m^3
2011/2012	11,4	367	32,2
2012/2013	10,55	341	32,28

Table 3: Firewood consumption and costs for households in Kosovo

The standard private house in Rastavic village has an overall floor area of 280 m^2 using a firewood stove and fireplace for heating only half of house and does not have any heat insulation. Improvements to increase energy efficiency in this kind of houses could include heat insulation of 10 cm thick on exterior walls and a new central heating system. For the heating system there are two options: 1) pellet boiler and 2) modern firewood boiler. The minimal heat power is 14 kW for both options. An overview of a simple cost benefit analysis of the two options is provided in table 1.

Description	Option 1: Pellet boiler	Option 2: Modern firewood boiler
Overall cost investment	11,093 €	10,280 €
Current annual fuel expenses	1,217 €	1,217 €
Annual fuel expenses after installing energy efficient improvements	421 €	486 €
Annual fuel savings	796 €	732 €
Simple payback period	13,9 year	14,1 year

Table 4: Overview of a simple cost-benefit analysis of two options for energy efficiency improvements in a private house

This investment is attractive from a financial point of view, especially taking in to account that a larger area of the house will be heated when using a pellet or firewood boiler. This is also contributing therefore also greatly to living standards.

When asked during a household survey, most people (62%) say that they are willing to invest in energy efficient measures, while 33% say that they are not interested to invest and 4% are not sure. However, in reality most people do not invest because of financial issues and lack of knowledge on these topics.

This feasibility study has shown that wood biomass forms an attractive energy supply option for individual household heating and/or public buildings. Also district heating could be used, although it is not wide spread in Kosovo, but offers good potential. In order to realise the potential of increasing energy efficiency by wood biomass it is important to bring in proven technology, to secure biomass supply (with contracts) and to provide subsidies and/or grants for initial support to cover (some of the) investment costs.

For further information refer to: PUB_10-Energy Efficiency Building Cases, *'Feasibility Study for Energy Efficiency of Buildings in three selected cases',* Julije Domac, Tina Opalic and Hrvoje Maras, Mihaela Mihadzic and Adam Babic, REGEA, under the WB-PROFOR SFM PES project, July 2013.

And refer to: PUB_13-Wood biomass Consumption Household survey, *'Study on firewood and other wood biomass use by population, Household Survey',* Tina Opalic and Luka Safar, REGEA, Sasho Petrovski, Haki Kola and Peter Kampen, CNVP, under the WB-PROFOR SFM PES project summer 2013.

4.6 PES opportunities on Energy Efficiency

Kosovo forests are important regarding carbon sequestration. Kosovo has a high use of fossil fuels and still limited amounts of renewable energy use. Wood biomass is offering a good option for renewable energy and Kosovo's forests can produce such while under sustainable forest management increase its carbon sink capacity. The current CO2 sequestration of Kosovo's forests is assessed at 4,213,365.52 CO_2. Assuming that one

hectare of trees sequester about 2.47 ton of carbon each year and that 1.0 ton of carbon is contained in 3.67 tons of CO_2.

The forests suffer for illegal logging and forest degradation which is reducing the carbon storage. It is therefore important to maintain and improve the forests carbon sink of Kosovo. There are several actions that are supportive to improve the carbon storage. With improved forest situation, regeneration of degraded forests the total wood biomass, the growing capacity and annual increment of the forest increases and therefore the carbon storage.

There is however no practice in Kosovo for carbon credits and specific framework and capacity for carbon credit market. Kosovo is not a signatory of Kyoto Protocol neither to UNFCCC. Kosovo has started efforts to make its legal and regulatory regime compatible with EU, and should therefore strive to achieve EU' 2020 energy and climate goals of cutting GHG's emission and energy consumption by 20% and increase renewable energy use by 20% by 2020.

For Kosovo PES on carbon sequestration and CO_2 emission reduction options exists through:

- Rehabilitation of degraded forest areas and increasing the carbon storage
- Afforestation of deforested areas
- Reduction of firewood consumption through applying improved wood stove systems or other heating systems
- Replacement of fossil fuels by renewable wood biomass fuels for especially heating systems. A scheme could be elaborated to support for example public building currently heating with fossil fuels to replace this with wood biomass. This will be a CO_2 emission reduction through use of renewable energy but as well energy efficiency through applying modern efficient systems.

Recommendations for PES opportunities on energy efficiency

In order to increase renewable energy and energy efficiency derived from wood biomass, it is needed to invest in its value chain from production, processing, logistics, sales to consumption. The establishment of a structured value chain with all chain actors requires value chain support services for strengthening small and medium enterprises (SME) in wood biomass processing (firewood, woodchips, pellets and briquettes), and establishing wood biomass trade centres. Furthermore, there is also need for strengthening other support services, such as: (i) businesses on trade & maintenance of equipment (wood chippers, briquette and pellet machines, and wood biomass heating systems), and (ii) knowledge, quality control.

There are some existing programmes that could contribute to financing the wood biomass value chain for renewable energy. These opportunities do not refer to PES specifically but are initiatives related to renewable energy and climate change mitigation and therefore, aiming at similar objectives. These programmes include:

- Rural Development programme (employment and diversification in rural areas) from national and EU RD programme
- Sector investments and programmes on SME (e.g. such as KPEP – USAID)
- Regulatory and capacity support programme on quality and standards in the value chain

Furthermore, there are potentials to increase energy efficiency especially in heating systems using wood biomass (wood chips and pellets) at household level (small scale), and at larger buildings or district heating. Furthermore traditional wood stoves could be improved, combined with proper seasoning of firewood. This would require awareness raising and the establishment of quality standards.

Financing opportunities for increasing energy efficiency for heating purposes exist and include PES for renewable energy systems on wood biomass. There are possibilities to support this with Rural Development Programmes for especially supporting rural households changing from using firewood stoves to using firewood, woodchips and pellets boiler for heating. Thus not necessarily replacing fossil fuels but supporting energy efficiency. Furthermore, enhanced energy efficiency could be supported by a Carbon Sequestration programmes such as CDM (Clean Development Mechanism), future REDD or voluntary carbon markets by replacing (larger) heating systems from fossil fuels to renewable fuels (wood biomass) or through becoming more energy efficient. This could be supported through carbon credits generated by e.g. public or other large buildings that have switched from fossil fuels to renewable wood biomass and/or have become more energy efficient. A programme could focus for example to all primary and secondary schools in an area.

For further information refer to: PUB_18-PES options Kosovo, *'Potential PES for carbon and other supportive scheme for wood biomass production and consumption',* NRS, CNVP, under the WB-PROFOR SFM PES project, September 2013.

5. List of publications

The following publications are available at the project website: **www.cnvp-wbprofor.org** and were used as reference in this summary document.

Documents
PUB_01-Inception part I final, 'Inception phase report *General Project Albania and Kosovo'*, under WB-PROFOR SFM PES project, April 2012
PUB_02-Inception part II final; '*Inception phase report part II Albania Ulza Watershed case*' under WB-PROFOR SFM PES project, April 2012
PUB_03-Inception part III final; '*Inception phase report part III Wood biomass case*' under WB-PROFOR SFM PES project, April 2012
PUB_04-Report on Plots Establishment, '*Experts Report on methodology of establishment erosion control plots and social aspects of farmer selection and coaching*', Todorov V, Petrovski S and Kampen P., CNVP and Blinkov I., Forestry Faculty Skopje University, under the WB-PROFOR SFM PES project, January 2013
PUB_05-Occorrence of Landslides and Flooding, '*Occurrence of Landslides and Flooding, past and current*', Diava and CNVP, under WB-PROFOR SFM PES project, July 2013
PUB_06-Description of Ulza Watershed Boundary, '*Description of Ulza watershed boundary*', Blinkov, I., Faculty of Forestry, Skopje, Republic of Macedonia under the WB-PROFOR SFM PES project
PUB_07-Bathymetry and Lifespan Analysis, '*Ulza Reservoir Bathymetry and Lifespan Analysis*', Trendafilov A. and Mincev I., Faculty of Forestry, Skopje, Republic of Macedonia under the WB-PROFOR SFM PES project, August 2013
PUB_08-PES Characteristics and Examples; '*Payment for Environmental Services: Characteristics and Examples, an Overview*' prepared by Iskra Konevska, Wageningen University under the WB-PROFOR SFM PES project, August 2013
PUB_09-PES Scheme in Ulza, '*Designing Potential Payment for Environmental Services (PES) schemes for watershed protection in Ulza, Albania*', Marianne Meijboom and Peter Kampen, CNVP under the WB-PROFOR SFM PES project, August 2013
PUB_10-Energy Efficiency Building Cases, '*Feasibility Study for Energy Efficiency of Buildings in three selected cases*', Julije Domac, Tina Opalic and Hrvoje Maras, Mihaela Mihadzic and Adam Babic, REGEA, under the WB-PROFOR SFM PES project, July 2013
PUB_11-Erosion Monitoring Ulza, **'***Monitoring and modelling erosion and runoff in the Ulza sub-watershed*', Blinkov, I., Faculty of Forestry, Skopje, Republic of Macedonia under the WB-PROFOR SFM PES project, August, September 2013
PUB_12-Wood Biomass Value Chain, 'Analysis of biomass supply chain, production and utilisation of wood biomass for Energy Production, Julije Domac, REGEA and Sasho Petrovski, CNVP, under the WB-PROFOR SFM PES project, April-September 2013
PUB_13-Wood biomass Consumption Household survey, '*Study on firewood and other wood biomass use by population, Household Survey*', Tina Opalic and Luka Safar, REGEA, Sasho Petrovski, Haki Kola and Peter Kampen, CNVP, under the WB-PROFOR SFM PES project, summer 2013

PUB_14-Forest Practices, '*Forest Practices in the Ulza Watershed*', Trendafilov, A, Blinkov, I., Mincev, I., Faculty of Forestry, Skopje, Republic of Macedonia and Omuri, I, CNVP under the WB-PROFOR SFM PES project, August 2013
PUB_15-Forest practices Kosovo, '*Forest Management Practices, supporting wood biomass production*', Haki Kola, CNVP, under the WB-PROFOR SFM PES project, 2013
PUB_16-Stakeholder analysis, '*Ulza Downstream and Upstream Stakeholder Analysis*', Diava, CNVP, under the WB-PROFOR SFM PES project, 2013
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CONNECTING
NATURAL
VALUES &
PEOPLE

Working together to grow a canopy of trees providing home, shelter, food, a livelihood as well as a place to wander

CNVP is a legacy organisation of SNV in the Balkans. Established through a legal demerger, CNVP will continue the SNV forestry and rural development programme in the Balkans and beyond.

CNVP envisions:

- Local communities achieving their own development goals;
- Maximising the production and service potential of forests through Sustainable Forest Management and locally controlled Natural Resource Management;
- Forests contributing to equitable local economic development supporting rural livelihoods;
- Forests contributing to wider societal interests and values including biodiversity conservation and wellbeing;
- Connecting natural values and people!

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