

**COST Action STSM FP1203: European Non-Wood Forest Products (NWFPs) Network**

**Short Term Scientific Mission Report**

**ROLE OF NON-WOOD FOREST PRODUCTS  
FOR MOUNTAINS FOREST-DEPENDENT COMMUNITIES' WELL-BEING**



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## Content

Summary .....	3
1. Background .....	4
2. Introduction .....	4
3. Purpose of the STSM .....	4
4. Description of the work carried out during the STSM .....	5
(a). What NWFPs forest dependent communities in mountain regions usually utilize? .....	6
(b) Access to NWFPs for local people in Ukraine and Italy .....	8
(c) How NWFPs influent on well-being of forest dependent communities in mountain regions .....	9
Future collaboration with host institution and foreseen publication .....	12
References .....	12

## Summary

Literature analysis illustrates that NWFPs in forest-dependent communities often contribute critically to local people's well-being. Use and management of NWFPs are important parts of SFM because they provide tangible economic and social benefits to rural communities. From a socio-cultural perspective, the use of NWFPs has a long tradition in many forested countries and therefore reflects local knowledge and social practices that are worth conserving. The potential of NWFPs to generate income and jobs could increase with the orientation of society and forest management towards sustainability. Social trends towards conserving traditions and using natural medicinal products could support the marketability and profitability of NWFPs.

NWFPs provide direct benefit to local people, especially to low income social groups in developing countries like Ukraine. To protect the interests of forest dependent communities, NWFPs should be included into the forest management planning, and recommendations for management of NWFPs need to be developed. Multiple-use forest management plans to ensure that timber and NWFPs are managed in a complementary manner need to be developed. NWFPs trade has the potential to contribute to rural well-being. Value-added processing of NWFPs has thus great potential to contribute to locals well-being, providing jobs and more revenue compared to sales of raw resources in both developed and developing countries. But in the developed and developing countries in rural mountains area it is needed:

- to create employment in rural areas
- to qualify and consolidate existing employment in rural areas
- to improve the attractiveness of rural areas for residents, enterprises and tourists
- to improve tourism in rural areas
- to promote the utilisation of energy potentialities, located in rural areas, in order to develop multifunctionality and diversification of agricultural holdings and
- sustainable use NWFPs&S and develop SMEs networks, to implement rural development policies based on income generation from nature-based activities Pettenella and Maso (2011).

## **1. Background**

NWFPs consist of goods of biological origin other than wood, as well as services derived from forests and allied land uses (FAO, 1999). NWFPs are defined as goods of biological origin other than wood, derived from forests, wooded lands and trees outside forests (FAO, 1999)

In recent years there has been huge interest in the recognition of the value of NTFPs and their role in supporting the livelihoods and well-being of many people. Rural people use NWFPs for food, income and farm inputs but also for social, cultural and religious functions.

Also during last year a strong movement observed towards promotion of NTFP production and marketing as a source of sustainable income-generation, especially for ensuring forest dependent communities well-being. Through the experience of forest communities the great importance of NWFPs (ranging from food, fruits and fibres, dye stuffs, flavours and medicines) have recently rediscovered for meeting people's needs. In recent years, a growing number of scientific researchers have suggested that given certain basic conditions, NWFPs can help communities to meet their needs without destroying the forest resource and increase their well-being.

## **2. Introduction**

Human well-being toward sustainable development is vitally dependent upon Earth's ecosystems. According to Millennium Ecosystem Assessment, 2003 "... well-being includes basic material needs for a good life, the experience of freedom, health, personal security, and good social relations. Together, these provide the conditions for physical, social, psychological, and spiritual fulfilment." Well-being of forest-dependent communities has been discussed long time in the context of community sustainability. Forests provide a broad array of essential services across all scales, from local communities to much broader scale. The mountain forests are important source for economic and social development (wood and non-wood products, renewable energy resource, and recreation) and ecological significance (watershed protection, erosion control, biodiversity conservation), a first priority now in many countries in particular in Ukraine and Italy.

## **3. Purpose of the STSM**

The purpose of the mission was to understand how NWFPs influence on well-being of forest dependent communities in mountain regions and how non-wood forest products can increase level of well-being of these communities. The STSM also aimed at reviewing the actual research results and scientific papers about NWFPs and forest dependent communities' well-being and other relevant literature.

According to the Work plan the following questions have been analysed:

- What NWFPs forest dependent communities in mountain regions usually utilize?
- Is access to collect NWFPs for local people in Ukraine and Italy free?
- How NWFPs influence the well-being of forest dependent communities in mountain regions?

#### 4. Description of the work carried out during the STSM

The Short Term Scientific Mission (STSM) related to the COST action FP1203 European Non-Wood Forest Products was at the University of Padua, Department of Land, Environment, Agriculture and Forestry, Legnaro, Padova, Italy between the February, 15 and March, 15, 2015. The scientific supervisor – Prof. Davide Pettenella. Also I had an opportunity to consult with the researchers from the same Department Enrico Vidale and Ricardo Da Re.

During the STSM relevant scientific publications and results of scientific projects were analysed and review of literature have been carried out. The STSM was conducted according to the Work plan and few additional tasks have been fulfilled.

- 1<sup>st</sup> week – studying scientific papers about NWFPs and forest dependent communities well-being, work with electronic library (especially from Scopus database) with literature relevant with the topic, beginning of the literature review;
- 2<sup>nd</sup> week – studying the questions: **a.** What NWFPs forest dependent communities in mountain regions usually utilize? **b.** Is the access to collect NWFPs in Ukraine and Italy free for local people?

Also during this week the Statistics course for PhD students on using the SW R have been fully attended. This short but very useful course covered the fundamentals in the design and analysis of observational and experimental studies. The participants instructed on how to decide what kind of analysis is most appropriate given the hypothesis of interest and how to interpret their results. Each lecture (3 hours) consisted of a theoretical part and practical PC exercises using the open-source software R, for a total of 5 lectures.

- 23 February - 14.00-17.00 - Basic concepts (Lecture 1 and Practical 1),
- 24 February - 09.00-12.00 - Introduction to statistical hypothesis testing (Lecture 2 and Practical 2),
- 25 February - 14.00-17.00 - Analysis of Variance (Lecture 3 and Practical 3),
- 26 February - 09.00-12.00 – Regression (Lecture 4 and Practical 4),
- 27 February - 14.00-17.00 – Synthesis and applications (Lecture 5).

Declaration about the statistics course attendance attached.

- 3<sup>rd</sup> week – studying of the questions: **c.** How NWFPs influence the well-being of forest dependent communities in mountain regions. Also during this week the relevant to STSM topic abstract for “*Perth III Conference: Mountains of Our Future Earth*” in co-authorship with my PhD dissertation supervisor in Ukraine Dr. Ihor Soloviy: “Rural forest-dependent communities' well-being nowadays: focus on the Ukrainian Carpathian Mountains region” have been submitted. The Centre for Mountain Studies together with the Mountain Research Initiative (MRI) and the Global Mountain Biodiversity Assessment (GMBA), all members of the Mountain Partnership, are organising this conference

<http://perth.uhi.ac.uk/specialistcentres/cms/Conferences/Perth2015/Pages/About.aspx>

- 4<sup>th</sup> week – seminar-meeting with the researchers at the Department of Land, Environment, Agriculture and Forestry at the University of Padova. In order to share knowledge and experiences between Ukraine and Italy in the non-wood forest products sector, a lecture on “Forest-dependent communities’ well-being: a case study in the Ukrainian Carpathians”. was presented.

Also during the last week design for a survey on NWFPs collection in Ukrainian Carpathians have been prepared (with the assistance of Ricardo Da Re). The main questions for this survey have been discussed.

The draft paper about NWFPs role in well-being of local forest-dependent people in Ukraine and Italy has been prepared during the last week and literature analysis relevant with the topic of proposed paper has been done.

The brief answers on the main questions of STSM are below. More detail these questions will be described in future publication.

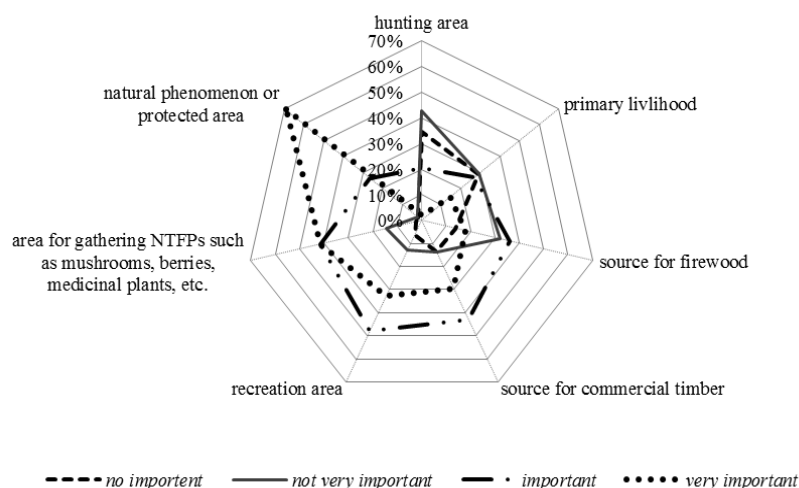
**(a). What NWFPs forest dependent communities in mountain regions usually utilize?**

Presently, estimates indicate that 80 % of the population in developing countries uses NWFPs to meet some of their nutritional needs and provide herbal medicine (FAO, 1999). NWFPs are the main ecosystem services from forests for local people.

In mountains regions local population use different NWFPs; for instance, in Albania most important are MAP and berries; in Bosnia and Herzegovina MAP, mushrooms, berries; in Montenegro mushrooms, berries and MAP, in Republic Serbia mushrooms, berries, MAP, animals; in Macedonia MAP, mushrooms, berries, lichens.

In **Ukraine** in mountains regions local people utilize berries and mushrooms, these give the main part of the communities’ revenue from forest. The most common forest product by value in Carpathian regions is blueberries (near 43% of locals - results of the FLEG Programme survey in 2014, Chernyavskyy et al., 2011). Villagers collect them both for sale and for family consumption (making jam, freezing for future use, drying in small quantities, in baking and consuming raw in summer) and also as gifts for friends and relatives in cities. Mushrooms (from 25% till 37% of locals) occupy the second place. They are collected for sale, own consumption (to prepare mushroom dishes and dry and can for the winter) and also as gifts. The fresh mushrooms are sold during the summer and autumn season as well as dried mushrooms during winter. People sell more than consume. Blueberries are the most popular product for sale and own consumption, because it is a traditional forest product for which there is always a big demand. Blueberries are delicious berries that are rich in vitamins and, thus, are bought and it doesn’t matter how high their price is. Other berries are also used for own consumption and for sale: wild strawberries, blackberries and raspberries. All these forest berries are tasty and rich in vitamins and that is why they are very popular.

In Ukraine during the FLEG-Programme survey community members reported that very important forests role for forest-depend community well-being as natural phenomenon or protected area (69.4% of respondents), area for collecting NTFPs - mushrooms, berries, medicinal plants, etc. (41.7%), recreation area (32.6%), source for commercial timber harvesting (29.4%), firewood (18 %), primary livelihood (14.6%) and hunting area (only 2% of respondents). More than two-thirds of the respondents said that it is very important to protect forests and survey results confirmed the hypothesis about the importance the role of forest resources and forest ecosystem services for forest dependents communities (Fig. 1).



**Fig.1.** Meanings that forest represents for local community

**In Italy**, like in other European countries, population does not depend heavily on NWFP for basic subsistence and nutrition. Most important NWFPs in Mediterranean countries:

- Pine nuts: Spain and Portugal; total production: 2-3  $10^6$  kg/ year (20-30 €/kg),
- Chestnut: Italy, Portugal and Spain; total production: 90  $10^3$  ton/year (600 €/ton),
- Acorns: Spain and Portugal as a livestock (for Iberian pig).

In Italy most important NWFPs are: chestnut, pine seeds, mushrooms, truffles, walnuts, blueberries, strawberries, raspberries, and acorns, bark (Cesaro, 1995). Other forest edible products: mushrooms (*Tuber*, *Lactarius*, *Boletus*) and berries (*Vaccinium*, *Prunus spinosa*, *Rubus*) are important in Mediterranean countries (Italy, Spain) and Northern (Finland) countries. Cork, mushrooms and honey are the main individual NWFPs encountered in Mediterranean countries (Merlo and Croitoru, 2005), but several others can be identified in smaller amounts. Resins, medicinal plants and herbs, lightwood, animal fodder, fibrous materials and bark, of the root of heather (*Erica arborea*) for the manufacturing of smoking pipes, seeds for use in tree nurseries, or for consumption (pine nuts) were the first important NWFPs used in the forests; mushrooms, berries, forest fruits, flowers, Christmas trees, medicinal plants, truffles and honey production are the ones being currently the most interesting for consumers (COST, 2007).

NWFPs play a remarkable economic role in stabilising income from forest ownership and are important niches in many rural contexts, especially in disadvantaged areas. In these countries individual activity connecting NWFPs picking can be divided in traditional (rural) and recreational (urban).

NWFPs have recreational and social value for local people in Europe especially as a mushrooms and berries picking. As shown us the results of NEWFOREX, project mushrooms and berries picking in mountain regions in Italy people estimate as a recreation activity. Also mushrooms and berries picking are quite frequent among the mountain users, as well as natural photography (see Figure 2).

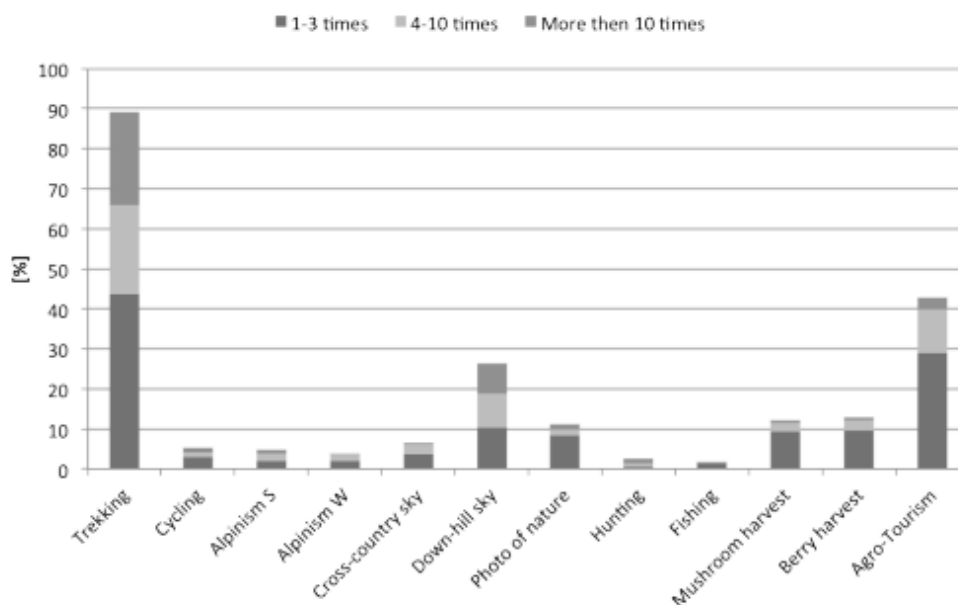


Fig. 2. Use of mountain in Veneto Region, Italy: frequency graph (the total number of respondent on this table is 369)

According to the NFI, 2% of the forest area was specific for production of NWFP and 0.2% of total forest area were classified as forests with prevalent touristic–recreational function.

### (b) Access to NWFPs for local people in Ukraine and Italy

NWFPs are an important source of food for the local inhabitants. However, the importance of NWFPs has been changing and collecting became more a recreational activity important for a broader circle of users. On the other hand, the pressure for economic income has forced forest owners to consider NWFPs as an important part of forest outcomes, which increased the production pressure of NWFPs. In many parts, collection of NWFPs for personal use still prevails; therefore policy measures targeting the sustainability of personal use are of high importance. However, the increasing popularity of collecting NWFPs among forest users in some parts of the Mediterranean has exceeded the level of “personal” needs, which triggered conflicts among the users and forest owners. These conflicts are more distinctive when the damage due to collecting is being caused to the owners or when the owners want to gather NWFPs for commercial use. Several forest policy instruments have been developed to manage such conflicts, e.g. subsidies for forest owners, limitations of free access, regulated access in favour of the owners or local inhabitants, local and lawful tolerances for the gathering of a modest amount of products. In the last years, contract mechanisms, licenses or permits for the use of NWFPs, issued by forest owners have been implemented in some parts of the Mediterranean countries (e.g. Italy and France).



In **Italy** for instance, for gathering mushrooms governmental bodies (Provinces, Mountain Communities, Municipalities) sell daily or seasonal permissions for collection (prices for daily permissions for collection no more than 2 kg range from 4 to 7 € per person). In some regions permission is for free and residents can be favoured (reduced fee, largest quantities allowed etc.). The law contains specific limits for amount and time of collection for selected species. In some regions, e.g. in Piedmont the regional law states, that money from picking permits has to be transferred to land owners. Collection of natural products is generally forbidden in private gardens, forests near houses or when cultivation is professional and licensed (e.g. truffle). Restrictions usually do not apply to forest owners; they may pick up unlimited quantities without permit or a permit free of charge (Mantau et al., 2001). For local people there free access to berries. Villagers collect them for family consumption (making jam, freezing for future use, in baking).

From the NEWFOREX report (<http://www.newforex.org/>) we derive that in Italy the overall forest output is low in terms of timber profitability but very valuable for the externalities produced. For instance, wild mushroom collection occurs and in many cases Non-Timber-Forest-Products (NTFPs) harvesting is more profitable than timber production. For an increasing number of NTFPs specific regulations have been introduced to keep sustainable levels of harvesting, in the same time allowing the transformation of NTFPs from public to club or private goods.

In **Ukraine** many people depended both directly and indirectly on the continued use of forests for livelihoods. Especially in rural areas in Ukraine people often don't have permanent jobs and they heavily depend on subsidiary agricultural products and NWFPs. Villagers collect mushrooms and berries for the following reasons: in Ukraine there is free access to non-timber forest products – almost all forests are owned by the state and mushrooms and berries can be collected (on protected areas collecting is allowed in certain places). A “forest ticket” must be obtained in order to collect NWFPs for sale (commercial use – if people need berries and mushrooms for sale - they should pay for it to the forest enterprises which should receive a permit - a special ticket). Forest products are in demand and they may be sold at the market or acquired by procurement centres in villages. In Ukraine, a lot of mushrooms and berries are traditionally consumed and they are an important source of seasonal income for the pickers

### **(c) How NWFPs influent on well-being of forest dependent communities in mountain regions**

In **Italy** as in other Mediterranean countries, the social and economic role of non-wood forest products (NWFP) is traditionally of high importance for local communities.

In developed countries NWFPs were important factors for locals and now continue to provide important social and cultural values for local households (Kardell 1980, Janse and Ottitsch 2005, Forest Europe 2011, Stryamets et al. 2012). Community living in the forest areas in and around them, often relies on non-wood forest products for the purpose of personal existence. Non-wood forests products have an important role in the livelihoods of many rural communities, particularly in developing countries, where they provide a broad range of subsistence and commercial livelihood opportunities. NWFPs are a resource of vital importance for the personal use in the time of natural disasters, but in the last period are becoming more and trademarks. In

the past the economic role of forests was linked essentially to wood production, but NWFPs in fact play a notable role as economic stabilisers, even though they are used for the purpose of home consumption or for small local markets (Cesaro, 1995). For instance, forests of Caucasus and Central Asia keep the rich pantry of wild-growing fruits, berries, nuts. These valuable alimentary and medicinal raw materials are a source of vitamins, carbohydrates, proteins, organic acids, aromatic, mineral and other materials necessary for the human well-being. The collecting and preparation of non-wood forests production can considerably increase productivity and efficacy of forestry, material well-being of local population and even to influence on the economy of the state. (Non-Wood Forest Products in Central Asia and Caucasus, 2006).

In Europe population does not depend heavily on NWFP for basic subsistence, health and nutrition. In Mediterranean as an industrial activity popular are cork, pine nuts, resins, and grazing. NWFPs have recreational and social value for local people in Europe especially as a mushrooms and berries picking. That's why, nowadays the definition by FAO concerning NWFPs is extended to cover also services related to the multiple use of forests like nature tourism, recreation, nature and landscape services (i.e. 'non-wood forest services', NWFS) (Maso et al., 2011). In Mediterranean Europe, around the southern-central Alps, high population density, poverty and low wood productivity of forests have traditionally stimulated an intensive use of all potentially available sources of food, fodder and raw materials. However, the non-wood forest products and services (NWFP&S) sector only began to be developed as a properly constituted economic sector in quite recent times. Indeed, its growth became apparent about two decades ago, at the same time as the decrease in conventional wood production (Pettenella et al., 2006).

Recreation in forests and related activity is the sector in which we found the greater number of private stakeholders, linked to the development of different structured activities (e.g skiing resorts, biking trails, provision of leisure activities in general). Forestry and mountains tourism as the major and developing economic sectors and main sources of employment and additional income are directly based upon ecosystem services such as wood or recreational resources (Melnykovich et al., 2011). The status of those resources has a great impact on the development of those economic sectors and therefore on socio-economic stability. But in Ukraine like in other developing countries recreation is not developed yet. People often use NWFPs as a source of food and additional income. In Ukraine selling NWFPs for making profits and the recreational and cultural aspect of collecting NWFPs are important.

In **Ukraine**, at present, NWFPs are not included into the forest management plans, in spite of this being important for implementing SFM including ecological, social and cultural, ecological. But NWFPs may provide important resource niches to forest-dependent people, especially in countries in transition. Additionally, NWFPs have potential to contribute to local livelihoods, providing resources for value-added products such as jams, extracts for medicines, vitamins, and antioxidants.

Commercialization and value-added processing of NWFPs could improve the contribution to household income, harvesting of NWFPs may find a niche role in development through ecotourism, in which collection activities are regulated and income is largely generated by providing services and valued products to tourists. However, there are many challenges to balance production of NWFP and wood as this is still economically the most important resource provided by forests and the increasing demand for NWFPs from the European forests.

Commercialization of non-wood forest products has become a means, promoted by researchers, conservation and development organizations, and, more recently, governments, to achieve rural livelihood improvement in an environmentally sound way.

### **Future collaboration with host institution and foreseen publication**

The collaboration with the host institution: the publication paper with the STSM results during next few months.

### **References**

- Belcher, B. & Schreckenberg, K. (2007). Commercialisation of non-timber forests products: a reality check. *Development Policy Review*, 25(3), 355—377
- Cesaro L, Linddal M, Pettenella D. 1995. The economic role of non-wood forest products and services in rural development. *Medit W* 2/ 95
- Chernyavskyy M., Soloviy I., Henyk Y., Kaspruk O., Henyk O., Melnykovich M., Herasym H., Savka V. 2011. Problems of local population legal assess to forest resources and illegal logging in forests of the Carpathians and the Western Polissya. - Liga Press, 2011. -256 p. (in Ukrainian).
- COST Action E30 (2007)“Entrepreneurship in the forest sector in Europe”. University of Joensuu, Faculty of Forestry *Silva Carelica* 52
- FAO (Food and Agriculture Organization of the United Nation). 1999. Towards a harmonized definition of non-wood forest products. *Unasylva* 198: 63-64
- Forest Europe. 2011. State of Europe’s Forests 2011. Status and trends in sustainable forest management in Europe. UNECE and FAO. Available in: [http://www.foresteurope.org/filestore/foresteurope/Publications/pdf/State\\_of\\_Europes\\_Forests\\_2011\\_Report\\_Revised\\_November\\_2011.pdf](http://www.foresteurope.org/filestore/foresteurope/Publications/pdf/State_of_Europes_Forests_2011_Report_Revised_November_2011.pdf)
- Janse G, A Ottitsch. 2005. Factors influencing the role of NonWood Forest Products and Services. *Forest Policy and Economics* 7: 309-319.
- Kardell L. 1980. Forest berries and mushrooms: an endangered resource? *Ambio* 9(5): 241-247
- Kilchling, P., Hansmann, R. & Seeland, K. (2009). Demand for non-timber forest products: survey of urban consumers and sellers in Switzerland, *Forest Policy and Economics*, 11, 294—300.
- Mantau, U., Merlo, M., Sekot, W., Welcker, B., 2001 *Recreational and Environmental Markets for Forest Enterprises*. CABI Publishing. 541 p.
- Maso D, Matilainen A, Pettenella D. 2011. The Role of Networks in Non-wood Forest Products and Services Market Development. In G. Weiss, D. Pettenella, P. Ollonqvist and B. Slee *Innovation in Forestry-Territorial and Value Chain Relationships*. Oxfordshire, UK: CAB International, 154-168.

Melnykovych M., Henyk O., and H. Herasym. 2011. Socio-economic impacts of illegal logging and their impact on the well-being of local forestry-dependent communities. In: Environmental, Economic and Social problems of inefficient and unsustainable forest practices and illegal logging in Ukraine: Proceedings of International Scientific Conference. Lviv, December 2-3. 2010. Lviv: Green Cross Society, Liga- Press 2011, pp.. 99-106. (in Ukrainian).

Merlo, M., Croitoru, L., 2005. Valuing Mediterranean Forests. Towards Total Economic Value. CABI Publishing, Wallingford.

Millennium Ecosystem Assessment. 2003. Ecosystems and human well-being: a framework for assessment. Washington DC: Island Press.

Nijnik, M. & Oskam, A. (2004). Governance in Ukrainian forestry: trends, impacts and remedies. In: Agricultural Resour Gov Ecology 3, 116–133.

Nijnik, M. & van Kooten, C.G. (2006). Forestry in the Ukraine: the road ahead? Reply. Forest Policy and Economics, 8(1), 6–9.

Non Wood Forest Products in Central Asia and Caucasus. 2006. Forestry Outlook Study for West and Central Asia (FOWECA). Prepared by the Central Asia Regional Economic Cooperation (CAREC) Program, FAO. Available at <ftp://ftp.fao.org/docrep/fao/010/ag268e/ag268e.pdf>

Panta M., Kim K., and C. Lee. 2009. Households' Characteristics, Forest Resources Dependency and Forest Availability in Central Terai of Nepal. Journal of Korean Forest Society. Vol. 98, No. 5, pp. 548-557.

Pettenella D, Klöhn S, Brun F, Carbone F, Venzi L, Cesaro L, Ciccacese L (2005). Italy. Country studies. In: Jáger L (ed.). COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. Acta Silvatica & Lignaria Hungarica. Special Edition, pp. 383-435.

Pettenella, D., & Maso, D. (2011). Networks of small-medium enterprises operating in forestry: some Theoretical concepts and empirical Evidence. G. Weiss, D. Pettenella, P. Ollonqvist and B. Slee Innovation in Forestry-Territorial and Value Chain Relationships. Oxfordshire, UK: CAB International, 35-47.

Pettenella, D., Ciccacese, L., Dragoi, S., Hedegus, A., Hingston, A., Klohn, S., Matilainen, A., Posavec, S. and Thorfinsson, T. (2006) NWFP&S marketing: lessons learned from case studies in Europe. In: Niskanen, A. (ed.) Issues affecting enterprise development in the forest sector in Europe, University of Joensuu, Faculty of Forestry, Research Notes 169.

Stryamets N, M Elbakidze, P Angelstam. 2012. Role of nonwood forest products for local livelihoods in countries with transition and market economy: case studies in Ukraine and Sweden. *Scandinavian journal of forest research* 27(1): 74-87.

Wong, J., Thornber, K. & Baker, N. (2001). Resource assessment of non-wood forest products. Experience and biometric principles. Food and agriculture organization of the United Nations, Rome.