

Scientific report

Short Term Scientific Mission (STMS)

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Economic Potential of Non-Wood Forest Products (NWFP) of Plant Origin: Innovative Aspects for Sustainable Use

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I. Background

The STSM work at University of Padova (Italy) was a part of work within the European Cost Action FP1203.

The research plan and programme of the work carried out within this STSM was relevant to the objectives and main activities of the COST Action, and particularly of its working packages (WP): **WP3** – on understory plants of Non-Wood Forest Products (NWFP) and innovative approaches to solving problems of their sustainable use.

II. Purpose of the visit.

The main purpose of developing a better understanding of how to advance sustainability of NWFP, with the ultimate objective of producing a joint paper in the light of the COST Action.

Besides, the main objectives of the visit were the following: carrying out scientific discussions, in particular with Prof. Davide Pettenella “Value added forest products: their role in rural areas development”, getting acquainted with experience and scientific accomplishments of the University researchers (associated professors Laura Secco and Elena Pisani) and organizing the interdisciplinary seminar.

III. Description of the work carried out during the STSM

During the visit to the host institution, the University of Padova, Italy, a number of scientific discussions were carried out with researchers and PhD students, and a scientific seminar (15.05.2015) was organized to deliver a presentation on “Innovative approaches to sustainable use of Non-Wood Forest Products: methodological problems and possibilities”.

IV. Description of the main results obtained

All research contacts and review of literary sources represented in the library of the University of Padova provided the possibility to focus on the following innovative aspects for sustainable use of NWFP:

1. Economic potential of Non-Wood Forest Products (NWFP) depends on forest ecosystems that produce natural goods and services. Therefore, Complex Forest Natural, Social and Economic Systems (CFNSEs) were chosen as the object for research, being spatial components of the terrestrial biosphere.

2. Innovative approach to accounting of natural capital of non-wood forest products should be based on the transdisciplinary physical-economic methodology for research of complex natural, social and economic processes occurring in the terrestrial space of the biosphere. Taking of physical parameters of this space into account provides the possibility of forming a new evaluation system in forest economic science and practice.

3. Awareness of the real value of Non-Wood Forest Products (NWFP).

The real economic value of forest products, including all their biological and social functions and a full range of forest management, should be identified, shown and taken into consideration. It is necessary to establish a system of collecting data and information, which covers all functions of forests, non-wood forest products (NWFP), services and their transactions to maximize forest profitability, as well as evaluation of the forest products' role for rural development. In this context a model of maintenance mechanism for the purpose of sustainable forest management is proposed.

At present separate components of forest and its functions stand out as independent objects of assessment (Fig. 1.).

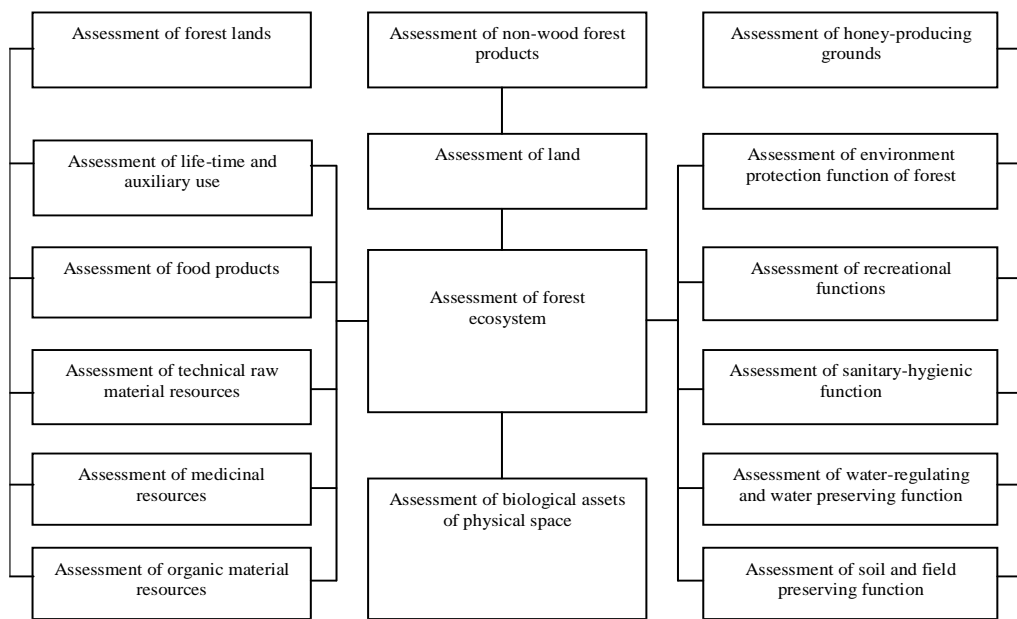


Fig. 1. Complex assessment of forests and their components

The total and comprehensive assessment of biological diversity of NWFP, in our opinion, must be carried out for the following purposes:

- to stimulate sustainable use of non-wood resources;
- to determine effectiveness of forestry management measures aiming at protection and reproduction of forest;
- assessment of the amount of losses inflicted on forests by natural phenomena or irrational methods of forest exploitation;
- to substantiate amounts of payment for the use of beneficial properties of forest and for establishing equal conditions for economic management of the subjects of economic activity who are using various resources;
- to create financial incentives and enhance interest in increasing productivity of forests and improving their quality;
- to ensure economic regulation of the processes of the use of forests and forest restoration.

4. The Non-Wood Forest Biodiversity in Ukraine.

The non-wood forest biodiversity is the national wealth of Ukraine, conservation and non-exhaustive use of which is considered a priority of the governmental natural resource, environmental safety and conservation policy, and an unavoidable condition of environmental improvement as well as of sustainable social and economic development.

In Ukraine, there are no forest landscapes unchanged by human economic activity. The marginally changed landscapes constitute 12.7% of the territory. First and foremost these are secondary forests, swamped areas, natural reserve areas and other conservation territories.

There are four general causes of forest biodiversity reduction: the inefficiency of markets, the inefficiency of governmental regulation and of institutions, as well as a low level of environmental culture.

Ukraine's biota includes over 70 thousand species today, of which over 27 thousand belong to flora and micobiota (fungi and slime moulds – 15 th., algae – 5 th., lichens – 1.2 th., mosses – 800, vascular plants – 5.1 th.)

According to the 1994 Forestry Codex of Ukraine, forests of Ukraine are in state ownership. The Land Codex of Ukraine declares that lands in Ukraine can be a state, municipal and private property. Accordingly, forests can have state, municipal and private owners as well.

The analysis of the world forestry experience suggests that transformation of state forests ownership may be premature for Ukraine. Deep transformation of state forests ownership leads to negative environmental and economic consequences and distortions of sustainable forest governance. Ukraine has to legislatively affirm the priority of state ownership over forests. The parcels of no more than 5 hectares of area, separated from large forest area borders, and adjacent to farms, could appropriately pass into private ownership.

The restitution and privatization experience of Central and Eastern European countries affirmatively suggests that processes of privatization have to be preceded by the creation of appropriate institutions capable of providing proper services and consulting private owners as well as assuring of control over silvicultural activities.

The area of forest-covered land in Ukraine has increased by 1,6 million hectares over the last 30 years, while the forest wood stock increased by 1 billion cubic meters, i.e. by 2.3 times.

Since 1989, a forest monitoring system is implemented in Ukraine, active in 14 regions. The monitoring system is run by the Ukrainian Research Institute of Forestry and Forest Melioration according to the European ICP Forest principles in conjunction with the U.S. Forest Health Monitoring program (FHM).

Nearly 15 million hectares of land are eroded in Ukraine, which is related to high share of ploughed land. Only in the recent 5 years, 37 th. hectares of anti-erosion forest plantations and 5 th. hectares of field-protecting forest belts were created by the State Forestry Committee enterprises. This leads to a decrease in the amount of non-wood forest products (NWFP). Estimation of their economic potential is a particularly topical issue today, relevant to their sustainable use and accounting planning, as well as to the budgetary transfer planning concerning levies for a special use of forest resources.

5. The concept of ecological supply

Supporting the productive function of forest ecosystems which include wood and non-wood forest products is a priority task on the path towards sustainability. Annual production of living matter is an important indicator of the forest ecosystems productivity, which has to be taken into account as a basis for evaluation of forest ecosystem services. This evaluation must be object oriented and grounded on a transdisciplinary physical-economic methodology.

Each forest area is a landscape with a specific volume of biological productivity. This productivity is expressed as the annual production of living matter (according to V. Vernadsky, 1977, Ukraine). For example, while being equivalent to 76.5 tons per hectare for meadow grasslands, it amounts to 1.22 tons per hectare for birch forest and to 1.3 tons per hectare for beech forests. Anthropogenic and economic pressure upon rural areas should be formed correspondingly.

Our concept of CFNSE systems' ecological supply based on their living matter's negentropic function evaluation is justified.

The innovative research approaches to environmental indicator development for sustainability, and to valuation of the NWFP's natural capital function, its consumption and conservation, are based on taking into account energy requirements of natural capital reproduction in the terrestrial biosphere. This gives the possibility to make managerial decisions on path to sustainability (Fig. 2).

Function of the ecological supply of the CFNSES [8, p. 48]:

$$Y_n = f(\text{NC}) = f(F) = f(E + T\sigma - \text{TS}_R)$$

where, Y_n – ecological supply of the CFNSES;

NC – natural capital of the CFNSES;

F – free energy of the CFNSES;

E – internal energy of the CFNSES;

$T\sigma$ – energy characteristic of negentropy of the CFNSES;

TS_R – energy characteristic of entropy.

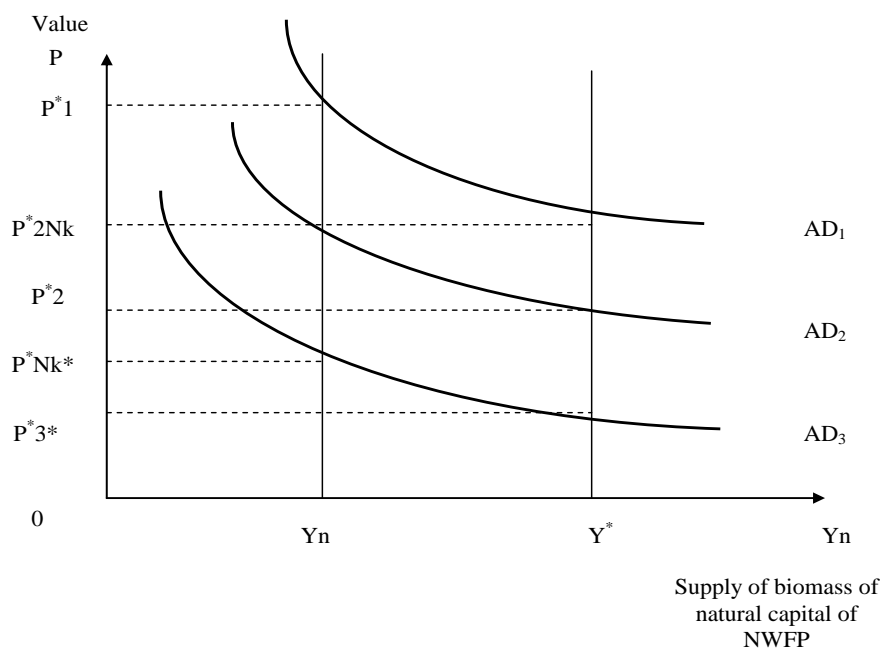


Fig. 2. Ecological supply and its effect on the value of forest natural capital of NWFP in the long term

6. The organization of education about forests and NWFP

Management of traditional and new activities in the woods should be based on education, which would include and contribute to a full review of numerous forest functions to solve problems that arise. There should be permanent learning which is an important element of sustainable forest management and implementation of the full NWFP economic potential. Such a system will facilitate the regular knowledge update on biodiversity conservation and environmentally friendly consumption of NWFP.

7. Innovation and expansion of partnership

New markets can and should be mastered through innovative scientific products and services that have contributed to the formation of forest sustainable development economy. We need joint efforts with the specialists in other fields who work over the issue of renewable energy, water and clean food, logistics of green-tourism and rural areas.

8. Effective use of non-wood forest products (NWFP)

Investments are necessary in the new and green technologies and innovations that will make the industry more efficient and competitive. We must use the full economic potential of non-wood forest products (NWFP), and its recreational and social functions.

9. Sustainable energy

In many countries, it is precisely forests that constitute the main source of renewable energy. Energy based on forests and NWFP is also important for life in rural areas, contributing to eradication of poverty. Use of energy based on non-wood forest biomass, which is renewable and carbon neutral, is particularly important. It is impossible to bring up the issue of intensifying the use of NWFP due to vital functions of forests.

10. Identification of principles and institutional framework for sustainable use of NWFP

Strengthening of law, security, land tenure system, information sharing and public participation should be based on a set of principles and values agreed at the national, as well as at the international level.

11. Removing the threats to forests. Sustainable use of NWFP

It is impossible to refer to the forests from the consumer perspective only. Only healthy forests can consistently represent non-wood goods and services, making a significant contribution to the 'green' economy in the long term.

VI. Future collaboration with the host institution

The ongoing research collaboration provides the possibility to develop the EU Horizon 2020 framework programme project proposals under Societal Challenges priority area, in the fields of Food Security, Sustainable Agriculture, Bioeconomy and Physical Economics; possibility of carrying out new scientific seminars of COST.

VII. Foreseen publications/articles resulting or to result from the STSM

The purpose of the publication is addressing the methodological problems, comparative analysis and evaluation of the NWFP economic potential in the context of the sustainable development of rural areas in European Union, Italy and Ukraine.

VIII. Confirmation by the host institution of the successful execution of the STSM.

IX. Other comments

I would like to thank the COST Program for providing financial support to cover the expenses of my visit and research at the University of Padova, Italy.

I also would like to express many thanks to Prof., Dr. Davide Pettenella, As. Prof. Dr. Laura Secco and As. Prof. Dr. Elena Pisani for their guidance, hospitality and kind support during my Short Term Scientific Mission to the University of Padova.

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