

5.2 Legal science support in securing forestry sustainable development: the EU experience

The issues of legal support of forestry sustainable development are presently of considerable significance in the sphere of science and approximation of current Ukrainian legislation to that of the European Union concerning forest management, due to Ukraine having chosen for itself the development of integration into the European economic environment as strategic direction.

The implementing of forestry sustainable development principles in the scientific research sphere is intended primarily to ensure an acceptable level of economic and social well-being for the population of Ukraine, inexhaustible consuming of the country's natural resources, forests protection and restoration being the main goal of sustainable development, which can be only achieved on condition of their conservation and augmentation.

The sustainable development Strategy "Ukraine – 2020" outlines the goal, for achieving of which the sustainable development of the state should be maintained through implementing structural reforms resulting in a raise of living standards. Ukraine is to become a state with a powerful economy and advanced innovations. To this effect, it is necessary first of all to restore the macroeconomic stability, to ensure a constant economic growth through inexhaustible modes of natural resources use in terms of ecology, to form favorable conditions for business practices and a transparent tax system. In addition, the Strategy provides for ensuring of guaranteed security for the state, the business, and the citizens, protection of investments and private property.

The "*sustainable development*" term is translated into Ukrainian as "viable development", or stable, comprehensively balanced, harmonious development.

According to the definition by the UN Commission on Sustainable Development, its goal is to satisfy the needs of present-day society in such a manner as not to endanger the ability of future generations to satisfy their needs.

Sustainable development is a controlled development. The basis of its controllability is the systematic approach and modern information technologies that

enable a rapid modelling of various development vectors, to predict their outcomes with great accuracy, and to choose the optimal one.

Among the viewpoints concerning the environment, two main approaches regarding the idea of sustenance can be singled out. The currently prevailing neoclassical economic model is an economy of sustainable growth. According to another theoretic approach reflecting the institutional direction in economic science (in particular the ecological economy approaches), the goal of human development is a stable economy (Deineka A.M., 2008).

Sustainable development can also be characterized as a process of ensuring the operation of a territorial system with preset parameters in certain conditions for a needed period of time that leads to harmonization of production factors and life quality improvement for the present and future generations with environment conservation and its gradual restoration. The object of stimulation is sustainable development of regional socio-ecological and economic systems. Prior to attaining sustainable development of a region, the system has to arrive to the state of equilibrium, harmony, balance, stability, competitiveness, and security. The extent of achieving the state of dynamic balance will be determined by a number of parameters. Each of the parameters will be characterized by certain numerical values, achieving or not achieving which by a system will mean corresponding attaining or not attaining of sustainable development. Nevertheless, the mechanism of a regional socio-ecological and economic system stimulation through forming the motivation for the system's intraregional self-organization to achieve sustainable development of a region remains uncertain (Polischuk V.G. & Zhogol O.V., 2014).

Sustainable development in the broad sense of this term supposes subordination of economic goals to environmental ones at a certain stage in social and productive forces' development. This change in goals priority is only possible when a society: a) has realized all the negative consequences of natural resources exploitation by the previously applied consumption systems based on depletion of natural resources and growing scales of environment pollution; b) possesses sufficient financial resources needed for implementing the new approaches in nature management based on radical

change in the structure of natural resources consumption, the use of resource-saving technologies and utilizing of all the wastes produced in the process (Deineka A.M., 2008).

To accomplish some of the mentioned goals, the Law of Ukraine “On Basic Principles (the Strategy) of Ecological Policies of Ukraine till 2030” was developed, its key tasks being to systemize ecological challenges and threats and diminish their number, and first of all, to introduce changes in public management with subsequent forming of new ecological policies. Thus, the main principles of ecology-related state policies are declared:

- conserving such a state of the climatic system that would eliminate the worsening of risks for people’s health and environment well-being;
- accomplishment by Ukraine of the Sustainable Development Goals (SDG) approved at the 2015 United Nations Summit;
- facilitating the balanced (sustainable) development through balancing the development components (economic, ecological, social), orienting at the balanced (sustainable) development priorities;
- integrating of ecological requirements into developed and approved documents concerning state planning, industrial (sectoral), regional, and local development in the course of decision-making on prospective operation of objects that can significantly affect the environment;
- inter-sectoral partnership and involvement of interested stakeholders;
- prevention of natural and human-caused emergencies through analysis and prognostication of ecology-related risks based on the results of ecologic assessment, the environmental impact assessment, as well as comprehensive monitoring of the state of the natural environment;
- fostering ecological safety and maintaining ecologic balance on the territory of Ukraine;
- raising the ecological safety level at the (Chornobyl) exclusion zone;
- ensuring inevitable liability for environmental legislation violations;

- application of the principles of caution and prevention, of priority in eliminating the sources of damage to the environment, “the polluter pays”;
- charging executive power bodies and local authorities with providing accessible, timely and accurate ecological information;
- state stimulating of national businesses that decrease greenhouse gases emission, lower their energy- and resources consumption, work on production modernization aimed at curtailing their negative impact on natural environment, including improvement of the ecological tax for environment pollution and rental payments for using natural resources;
- introduction of modern forms and means of communication and efficient information policies in the environment protection sphere.

To return to the issue of conserving and restoring the forests as a global factor influencing the state of environment, it became of special urgency following “the Earth Summit”, the UN conference on environment and development that took place in Rio-de-Janeiro in 1992. This UN conference, called “Rio-92” for brevity, developed the basic principles and ideas that serve as foundation for outlaying requirements for the use of natural resources that ensure sustainable development for all the states in this century. The main documents concerning the forests are “The Forest Principles” and the “Convention on Biological Diversity” (Deineka A.M., 2008).

Its main provisions were reflected in the documents titled “Agenda 21” and “The Forest – Principled Statement”.

It was declared that:

- all the states participate in the greening of Earth by planting and conserving forests, and are entitled to use the forests for their socio-economic development on the basis of the national forest policies that correspond to the sustainable development principles, as well as to form sustainable production and consuming structures that ensure ecologically safe use of forests;
- the use of forests is to be targeted at satisfying social, economic, ecological, cultural, and spiritual needs of the present and future generations;

- the national forestry development programs are to ensure protection of unique forests that are of cultural and historic value;
- to provide assistance to the states that plant new and protect the existing forests;
- to ensure the panning of ecologically safe technologies of maintaining forestry business; to procure pollution control of wastes that damage forests, etc.

The sustainable forestry business (SFB) concept is considered as a component of the overall sustainable development concept and the forestry balanced development strategy. The content and the idea of the SFB concept are permanently improved. The Montreal process and the Ministerial Conference on Protection of Forests of Europe (MCPFE) attest to this effect. At the international level, in Europe in particular, the SFB concept is formed by the states and non-governmental organizations that participate in the Ministerial Conferences on Protection of Forests of Europe, the so-called pan-European process. The set of criteria and indicators of SFB as well as forests protection have been agreed upon by member-states and are gradually implemented at the national and the regional levels in many European countries (Saharnytska L.I., 2014).

The MinistersialConference on Protection of Forests of Europe (MCPFE, 1993) formulated the following definition of the term of sustainable forestry business (SFB): this is management and use of forests and forested lands in such a manner and at such a rate that ensures the conservation of their biological diversity, productiveness, viability, and self-restoration, as well as their potential to fulfil at present and in future the related ecological, economic, and social functions at the local, the national, the international, and the global levels without damaging other, non-forest ecosystems. In recent years, considerable attention is paid to strengthening and support of socio-cultural functions of forest. At the Earth Summit in Johannesburg in 2002, it was accentuated that to ensure humankind's sustainable development, the socio-cultural functions of forest should be augmented (Saharnytska L.I., 2014).

Besides the above, the European Union Forest Industry Strategy approved on January 30, 1997 should be mentioned. It proclaimed counteracting to erosion,

deforestation, fires, and biodiversity degradation, the need in financial support of sustainable forestry development, implementation of efficient stimuli targeted at agricultural forestry development.

The European parliament has expressed its concern about the state of public-owned forests, as well as negative consequences of environment pollution, forest fires, and felling of tropical forests. In its resolution, special attention is paid to the need in fostering forest-related education and science, increasing the territory of forested areas, and raising the forest resources quality.

The most deep-rooted from the historic perspective are the ideas of sustainable forestry development in Germany, whose legislation obliges to conduct sustainable forest business in all forests regardless of ownership. In 1996, Germany introduced into business practice the “Sustainable forestry timber” trademark. In 1998, a group of German specialists jointly with the World Forestry Council prepared the document titled “The Directives on Sustainable Forestry” that provides for certifying forests on the FSB principles adapted to Germany conditions. This document stipulates, inter alia:

- the movement of transportation means in a forest by roads only;
- conservation of the unique trees; refusal from using chemicals in forestry;
- utilizing the materials which do not decompose;
- avoiding the formation of the same-age forest plantations;
- targeting at the natural restoration of forests;
- prohibiting clear cuttings;
- using timber within the limits of yearly yield, free gathering of forestry by-products.

In the forests of Germany, an estimated forest plot is used only by 50% because the national wood-harvesting covers only 30% of the needs in wood, the other 70% of wood materials being imported from abroad. In the last two years, the state of forests in Germany has improved due to a decrease in environment pollution.

In Belgium, the law was passed in 1999 that obliges to carry out forestation of all the low-production and unused lands regardless of ownerships. The state purchases

such lands from private owners for further forestation. Within the EU program, 50 thousand hectares of such lands are to be forested.

Expenditures on forestation are partially reimbursed to forest owners. Funds are allotted on forming shrubbery boundaries between agricultural lands and forests. For each three hectares of forested lands the state awards 2,000 Belgium francs, and for 30 ha – 12,000 francs. Also, funds are allotted on forests cultivation and on compensations of the lost incomes to land owners.

Scandinavian countries refrain from cultivating plantation-type forests (with the exception of those planted for scientific purposes). Forestry policies in Finland are targeted at prohibiting clear cuttings and intensive forest thinning. The local legislation obliges to restore forests following timber harvesting and sets forth the minimum requirements for forest care. It is prohibited to destroy forests and damage the processes aimed at forests restoration.

In Finland, yearly plans of forests restoration are compiled, which include forest owners of all forms of property. The state provides concessional loans for measures aimed at improving forests condition and forest roads construction. Efficient forestry policies have led a small northern country to the first position in the world concerning forest products exports that amounts 36% of the world supplies. The Finland's forestry policies are targeted on integrating the forest industry with businesses, trade, tourism, and hunting. Despite Finland's location in the north of Europe, the forests ever more often become the resting places, especially forests close to cities and towns. The state and numerous communities create well-equipped resting areas in such places.

And does the forestry of Ukraine comply with the sustainable development principles and criteria? (Liubchych, A., Savchuk, O., & Vrublevska-Misiuna, K., 2020). The forests unmarked by human activities comprise only 59,000 ha, semi-natural – 4,974,000 ha, forest plantations – 4,425,000 ha. The same-age forests comprise 88% of forest areas, and those of different ages – 12%. Ukrainian forests are regularly damaged by fires, strong winds, wild animals, insects, and diseases.

In Ye. V. Mishenin's opinion, the principles of achieving the optimal ecological, economic, and social conditions for sustainable development of forest industry include:

- the maximum and priority use of environment-protection and environment-transformation functions of forest ecosystems from the perspectives of the national and international interests;
- attaining ecologically-oriented (maximum) territories forestation;
- an integrated, complex, and economical resource-oriented forest use;
- considerable decrease in the levels and scales of anthropogenic (industrial and inter-sectoral) impact on forest ecosystems' condition;
- formation of ecologically-orientated business mechanism of nature use and eco-systematic forestry management;
- ecological certification of forestry business systems; organizing and maintaining of forests monitoring; development of ecological education (Mishenin Ye.V., 1998).

Currently, a number of institutional, organizational, and management foundations of forestry sustainable development are being formed in Ukraine, which are simultaneously aimed at the use of natural resources, the quality of life improvement, and environment conservation. The rational use, conservation, and sustainable exploiting of all kinds of forests is the most important element in economic and social development, environment conservation, as well as sustenance for the planetary life-supporting system. Forests play a vital role in supporting the atmosphere in a healthy state, as well as in the biologic diversity, soil and water resources conservation. Therefore, they are an inseparable element of the sustainable development process and are of extremely great importance for humankind.

Strategic directions of Ukrainian forestry development are to be based on the international aspects of ecologically balanced forest use and forests restoration policies, as well as on the ideas of sustainable development in terms of forest problematics determined in Lisbon (1998), and all-European criteria of forest use. The following sustainable development criteria of the forestry sector of Ukraine should be considered:

- conservation and increase of forest resources and their contribution to the global carbon cycle;

- conservation and support of forests production functions (tree-plants and non-wooded plants);
- support, preservation, and broadening the biological diversity in forest ecosystems;
- augmenting forests' protective and other socio-economic functions in the course of running forestry business.

In connection with establishing of the new economic relations in Ukraine and the need in overcoming the contradictions among the ecological, economic, and social goals, the implementing of forestry sustainable development is vital for increasing the forests areas (Melnik V.V., 2016).

In order to ensure the Ukrainian forestry sustainable development and raising the role of forest sector, the Concept of forestry reforming and development and raising the role of forest sector was elaborated and approved by the Cabinet of Ministers of Ukraine decree of 18.04.2006. No. 208.

The main goals of the Concept are:

- improvement of regulatory legal framework in the forestry sphere and its harmonization with the international principles of forestry sustainable development;
- optimizing the structure of forestry enterprises and organizations;
- increase in the territory of forested areas to the scientifically substantiated optimal level;
- the forests resource and ecological capacity-building;
- conservation of forest ecosystems' biodiversity;
- enhancing forest ecosystems resilience to the environmental negative factors, growing anthropogenic load, and climate changes;
- solving regions' forestry-ecological problems;
- efficient use of forest resources on market principles;
- improvement of the economy-and-finance arrangements;
- increasing forestry profitability in forest-supported regions;
- facilitation of solving local communities' socio-economic problems;
- strengthening legal protection of forest security employees;

- development of forest-related science and education;
- enhancement of international cooperation;
- informing public on the state of forestry, involving them into decision-making concerning the use of forests natural potential; ecological education.

It is highlighted in the Concept that the material base of forestry science and education does not correspond to the world standards. It also defines as the key moments, in terms of scientific complexity, the need in increasing forest cover to a scientifically substantiated level; improvement of science and human resources; enhanced cooperation with science and education organizations, conducting of joint research. Also, in terms of financial security, expanded forest reproduction and agro-forest-melioration is envisaged at the state budget expense in the steppe and forest-steppe natural zones, as well as maintenance of the nature reserve territories and objects, forests protection from fires, illnesses and pests, forest care cuttings, etc.; the development of forestry science and education, fostering and propagation of ecology culture (development and support of school forestry groups, organizing measures on public-supported forests planting, publishing activity, informing public through mass media, etc.).

The ways of solving the mentioned tasks have been agreed on by joint efforts of scientists and specialists in the field.

Scientific research work in the forest industry is carried out by two science-research institutions: the Ukrainian Science and Research Institute of Forestry and Agro-melioration named after G.M. Vysotskiy and the Ukrainian Science and Research Institute of Mountain Forestry named after P.S. Pasternak.

The research financed by the state budget were carried out on 23 topics, by orders of the sectoral industry enterprises – on 80 topics (amounting to nearly one million Ukrainian hryvnias). Its subject matter includes ecology-forestry expertise of forest roads construction projects, development and adjustment of technical documentation on forest roads fulfilled by the Pasternak Mountain Forestry Institute on the request of and financed by the industry enterprises.

Among the areas of the forestry institutes' research are forestry, forests restoration (forest cultures and agroforestry melioration), forests protection, forest ecology, forest soils science, forest plant species selection, monitoring and certifying of forests, new information technologies, economy and forestry organization, and hunting study.

According to the European Forestry Institute, among the research areas of 63 forestry research institutes from 36 European countries prevail (in the order of descending) forestry, forest protection, forest ecology, forest soils science, forest genetics, physiology and pathology, forest economy. It can be seen that the same research areas prevail at our [Ukrainian] institutes as well, with the exception of forest physiology and pathology. Nevertheless, this research will hopefully be soon renewed after the needed equipment base is formed.

One of the priority tasks of forestry science is to revision the standards that regulate the forestry business operation. Therefore, the standards on thinning and sanitary felling account for the need in biological and landscape diversion conservation, determine the specialization and target orientation of forestry activities in concrete conditions.

Considering the need in natural forests protection, biodiversity increase, and raising forest ecosystems resilience it is recommended to foster the introduction of gradual, selective, and combined methods of felling in forestry practices by the improved and modern technologies, to facilitate forming natural plantations of main forest species. These are the guidelines set forth in the regulations developed by the sectoral institutes' scientists.

To accomplish the principles of non-extensive forestry business operation it is necessary to implement modern inventory and monitoring technologies, distance methods of assessing the forests' conditions, and geo-information technologies. These issues are studied by the scientists at laboratories of forests monitoring and certification, and of the new information technologies at the G.M. Vygotskiy Research Institute of Forestry and Agro-melioration (Savchuk O. & Liubchych A., 2019).

Ukraine takes part in the Ministerial Conference on Forests Protection in Europe (the pan-European process) and, according to the signed L2 Resolution, it undertakes to develop the national system of criteria and indicators of sustainable forestry and forest use operation (CI-SFO) adjusted to the corresponding pan-European criteria and indicators. The mentioned Research Institute of Forestry and Agro-melioration has developed the draft project of this system harmonized with the international standards, the sectoral and supra-sectoral legal framework of Ukraine.

The two institutes participated in the development of 14 draft regulations needed for ensuring non-extensive forestry operation. Among them are: the Forests restoration rules; the Rules on improvement of forests qualitative composition; the Procedure for forests categories and allotment of specially protected forest plots; the Procedure for special use of forest resources; the Procedure for issuance of special permissions for using forest resources; the Instruction on allotment and taxation of felling plots in forests; the Manual on harvesting of secondary timber and carrying out the secondary forest use; the Manual on the use of forests' beneficial properties; the Rules for inspecting the sites of forest resources use; the Final felling rules; the Rules for accounting, storage, filling, issuance, and cancellation of logging and forestry tickets; the Manual on forests formation and rehabilitation felling; the Procedure for organizing and carrying out of forests certification; the Procedure for monitoring the forests.

The P.S. Pasternak Science and Research Institute of Mountain Forestry has developed new sectoral documents concerning designing and construction of forest automobile roads. They include in particular:

- the functions of the head scientific organization of the State Forestry Agency of Ukraine on the issues of forestry transportation (approved on 21.02.2007.);
- recommendations on implementing the numerical system of forest commercial roads identification;
- the Procedure for carrying out of forestry-ecological expertise and registration of technical documentation on forest roads construction and reconstruction (following the testing and adjustments, the final version has been passed to the State Forestry Agency of Ukraine);

- the Procedure for acceptance into operation of the newly constructed (reconstructed) forest roads;
- Requirements for organizing of the newly constructed forest roads operation;
- the Procedure for road network planning, designing and constructing of forest roads on the territory of the forest fund of Ukraine (following the coordination, the final version has been passed to the State Forestry Agency of Ukraine).

The scientists have also: substantiated the principles of organizing and carrying out of the national inventory and monitoring of the Ukrainian forests; the technology of forming the forestry information system based on the geo-information database is being developed along with the remote screening methods.

The prospects of applying the Czech geo-information Field-Map in forestry operation, forests monitoring and inventory, felling plots allotment and taxation have been identified.

The national account on the outcomes of Ukrainian forests monitoring has been prepared and passed to the Coordination Center of the International Co-operation Program of Forests Monitoring (ICP Forests) at the Institute of the Forests of the World at Hamburg.

The methodological foundations for carrying out the national sample-statistical forests inventory on the basis of advanced technologies of data gathering and processing have been set. Models for assessing the greenhouse gases emissions and absorption in forestry have been developed. The third edition of the sustainable forestry operation criteria and indicators for carrying out the voluntary forests certification has been prepared. The materials for the national account on qualitative indicators of forestry sustainable operation have been prepared for the Ministerial Conference on Forests Protection in Europe to be held in Warsaw (by 30 indicators). The fulfilment by Ukraine of its obligations to the mentioned Conference concerning biodiversity protection has been analyzed.

The international cooperation in the sphere of science plays an important role in fostering the balanced forestry management. Thus, the sectoral institutes participate in

the international projects and processes. The Ukrainian Research Institute of Forestry and Agro-melioration takes part in 4, and the Ukrainian Research Institute of Mountain Forestry – in 5 such projects (work within the EUFORGEN International program on forest plant species biodiversity is joint for both the institutes).

The Ukrainian Research Institute of Forestry and Agro-melioration participates in:

- The International Co-operation Program of forests monitoring in the UN European Economy Commission region (ICP Forests).
- The Holland-Ukrainian project “Facilitating Balanced Forest Management”.
- The “Responsible Forestry for Non-Extensive Development. Romania, Bulgaria, Ukraine, WWF” joint project.
- The EUFORGEN International program on forest plant species biodiversity.

The next phase of the TechInLis (the transfer of advanced methods and technologies in forests inventory and monitoring) project is planned to be initiated.

The Science and Research Institute of Mountain Forestry participates in:

- The “FORZA” Swiss-Ukrainian project on Trans-Carpathian forests development, solving the applied issues of implementing modern forestry methods in mountain territories.
- The joint project with the Swiss Federal Institute of Forest, Snow, and Landscape (WSL) for studying the structure of virgin forests in Ukrainian Carpathians.
- The project “Instruments for Regional Forest Management Planning in Ukraine” jointly with the Czech Institute of Forest Management.
- The EUFORGEN International program on forest plant species biodiversity.
- The Temporary Secretariat of the Carpathian Convention.

Besides, the sectoral scientific institutions cooperate with various European forestry organizations for the purpose of information exchange.

The Ukrainian Research Institute of Forestry and Agro-melioration:

- with the International Agency on Atomic Energy and the Institute of Radiation Protection (Paris, France);
- with EFI, the European Forest Institute, Finland;

- with the IUFRO work groups on legal issues of sustainable development, forest pests and illnesses control, etc.;

- with the Reginal Directorate of state forests in Lublin with the purpose of studying the financing and supplying forestry enterprises with special equipment and mechanisms;

- with the Forest Institute at the Belarus National Academy of Sciences.

The Science and Research Institute of Mountain Forestry:

- with the Polish Forest Research Institute, the Polish scientific organization “Hemipan” (Warsaw), and the Department of Forest Protection at Bialystok Forest Technical Institute concerning the use of pheromone insecticides;

- with the Urals division of the Russian Academy of Sciences Botanical Garden concerning the issues of researching the genetic differentiation in the common pine in Ukrainian Carpathians;

- with the Lublin Catholic University for the purpose of studying the climatic and anthropogenic factors influencing the changes in forest ecosystems;

- with the BilDIPROLIS for the purpose of developing prospective plans for territories’ transport development.

Despite a significant role of science in the forestry sustainable development and scientists’ considerable achievements in development of priority areas in science and solving important industrial tasks, there are many serious problems that have to be dealt with immediately to avoid losses in scientific potential.

First of all, the science research efficiency is determined by personnel. The situation with the scientific workers remains stable for the time being. As of the beginning of this (2021) year, the number of the sectoral research institutions employees was 793, of which 329 specialists were directly involved in science-and research work. Among the employees, 177 persons are scientists, of which 9 are doctors of sciences and 46 are candidates of sciences. For succession, postgraduates and aspirants are trained: at the Research Institute of Forestry and Agro-melioration 31 postgraduates study, 8 of them combining study with work, and 23 studying full-time;

also 23 aspirants study there. In 2007, five post-graduates completed their course of study, and 7 post-graduates were admitted.

The state should cherish the qualified personnel and the forestry scientific schools, to prepare timely the succession represented by the best members of the talented youth. Qualified personnel is cherished when they are devoted to science and when they are interested in fulfilling their work even despite a deficit in equipment, chemical reagents, or transportation means observed in Ukraine. Ukrainian scientists often have to purchase books, publish their articles and monographs and attend scientific conferences on their account.

For that reason, some qualified scientists look for employment in other positions, in particular in teaching vacancies where with a lesser workload and smaller working hours they are slightly better paid and can devote free time to scientific work. Lack of housing for non-resident scientists and non-existent perspectives of obtaining it handicap involvement of talented youth in science. The need to keep their families compels young scientists to take additional part-time jobs, which decreases the quality of the main work and causes staff turnover. This is to say that in Ukraine the acute problem of scientists' low salaries and providing them with housing remains unresolved.

To arrange experiments and carry out full-fledged research of all the forest ecosystems' components, the scientists have to stay in the forest for the most part of the vegetation period. The recommendations will be sufficiently substantiated only when the experiments are held in a wide range of geographic and forest-plant areas with obligatory use of reference plots. Despite the annual increase in financing the research, the funds for business trips, consumables, publishing activity, and vehicles maintenance are very lean.

The pilot coverage of a large area of the country in various climatic zones is to a large extent facilitated by the availability of a well-developed research stations network. The Complex Program of Sectoral Science Development for 2006 – 2015, formed and approved by State Forestry Agency order, contained some measures to increase the area of scientific institutions' research base.

Presently, the draft State Strategy of Forest Management in Ukraine till 2035 has been developed. As a separate area of accomplishing the strategic goals, it provides for the issues of research and education support. In particular, the main goal is qualitative training of forest industry personnel; the network of scientific institutions and enterprises that carry out research in forestry need modernizing; the priority is the development of the set of measures to improve population's ecology awareness both in terms of forestry activities and concerning the forests value in general as a living ecosystem.

The higher forestry education and science at the present stage should be incorporated in the forestry policies, be an inherent part of mutual relations between state governing bodies in forestry issues, the public, and forestry enterprises. The chief priority in future specialists training is forming their vision and principles, equipping them with sufficient theoretical knowledge and corresponding practical skills related to sustainable forestry management, particularly fulfilment of the whole complex of forestry maintenance and other measures that form resilient and productive forests under conditions of climate changes and other unpredictable challenges in the future on the basis of applying information technologies and the latest scientific knowledge on the nature of forest ecosystems.

To improve the forestry education system it is planned to:

- increase the quality requirements for educational programs of training bachelors and masters in forestry, in particular as to academic and professional qualification compliancy assessment of the science-and-pedagogical workers involved in teaching the training disciplines;
- establish efficient cooperation between universities and forestry enterprises for implementing scientific developments and the best international practices in production;
- form conditions needed to improve investment attractiveness of sectoral scientific institutions' research, technical, and innovative activities;
- develop the modes of efficient introduction of the latest scientific achievements to forestry production;

- form a modern technical base to support scientific activity at a due level.

Currently, a considerable area of testing sites has been laid for research by scientists in the sectoral enterprises forests. Presently, there are more than 1,100 such object with the area of more than two thousand hectares. Regrettably, forestry enterprises are not always “happy” to accommodate scientific research. All the forestry enterprises managers should realize that scientists work for the benefit of the country’s forest industry and facilitate carrying out of scientific research, let alone entering into business agreements. It is about paying the slightest attention to scientists who go in the field to set experiments, carry out measurements, take soil samples for analyses, and so on. They often have to get by suburban public transport, get to the testing areas on foot, and to catch the last bus going in town. It would be desirable if all forestry enterprises had guest rooms for scientists who come to conduct experiments on the site for them to have some place to put a sleeping bag, to heat some water, etc. One has to work in the forest from early in the morning till late at night for understanding the complicated processes taking place there.

The scientific value of stationary research facilities grows with time. More than one generations of scientists will work there. Therefore, it is proposed to grant an appropriate protection status to the most important science- and research facilities located on the territories of forestry enterprises.

Another problematic issue is forestry enterprises’ interest in implementing the scientific research results. There are scientific developments that are always needed by forestry-based production. These are the developments linked with forest protection, growing quality planting materials, the use of automated workplaces, etc. On these issues forestry enterprises always confer with scientists, sign business agreements, seek for specialists’ advice on the latest achievements in the field.

Other scientific developments, as experience shows, can only be implemented through a coercion in the form of an order by the State Forestry Agency. This concerns, for instance, the forestry business technologies. Without an order, enterprises would not purchase genetically improved planting materials or seeds due to their higher price

and the 50-year time lag when their advantages will be noticeable. This is to mention just one of many examples.

Therefore, it is necessary that science workers jointly with regional forest administrations work out an efficient, economically sound procedure for implementing developments that will provide for not only implementation itself, but also the authors' supervision and rendering consulting services by the research organization.

Publishing of the completed scientific developments is a component of scientific institutions' edition work. The number of publications per scientist keeps growing in recent years. The "Forestry and Agro-melioration" journal is published regularly. It features the articles by not only sectoral research institutions workers, but also forestry departments' university teachers, and production workers. Also, scientific works and recommendations by the Research Institute of Mountain Forestry are regularly published. The materials on scientific work of the two Institutes can be found on the State Forestry Agency site.

In conclusion, it should be emphasized that presently the forest industry requires qualitative and prompt scientific support more than ever before.

However, the forest science should not only catch up with solving the current problems, though this is needed as well. One of scientists' main tasks is a clear vision of the perspectives of forestry development, substantiation of future priorities and challenges for making efficient managerial decisions and ensuring a balanced forest industry operation.