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Integration of Environmental Values into the Management System of Forestry Enterprises in Accordance with the Requirements of Forest Certification

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Abstract. The relevance of the study is conditioned by the importance of proper application of forest certification as a tool for responsible forestry. The lack of integrated approaches and formalities in the implementation of forest certification requirements is unacceptable from the standpoint of the interests of society and the environment. The purpose of the study is to substantiate the theoretical and practical foundations of integrating environmental values as one of the requirements for forest certification under the Forest Stewardship Council, into the management system of forestry enterprises. General and special methods (analysis, synthesis, generalisation, and comparison), and the regulatory framework for forest certification and the quality management standard were used for the research. The paper describes the concept of environmental values in the context of its components. It is proved that system, process-based, adaptive, and risk-oriented approaches to management are the basis for integrating the concept of environmental values into the management system of forestry enterprises. It is determined that the development of processes that cover the requirements of forest certification for environmental values and their documentary support are elements of the mechanism for integrating environmental values into the management system. Such processes are related to: identification of environmental values; determination of the purpose and criteria for making decisions on them; assessment of the impact of economic activities on them; development and implementation of measures for their conservation, maintenance, and protection; monitoring of the state and measures. Procedures, monitoring methods, training programmes, standard accounting and reporting forms are components of documenting these processes. The study results will be useful for improving the management system of forestry enterprises in accordance with the requirements of forest certification in terms of planning, organisation, monitoring, and control. The implementation of the tools and practical steps outlined for this purpose will contribute to the growth of efficiency of enterprises and their competitiveness in markets, access to which is determined by the requirements for the sustainability of the origin of forest products

Keywords: environment elements, FSC standard, compliance assessment, system approach to management, process approach to management, adaptive forestry

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Introduction

Ensuring responsible forest management in the face of modern challenges as one of the tasks in the context of the Global Sustainable Development Goals requires effective tools [1]. Forest certification is a market-based tool aimed at ensuring environmentally balanced, cost-effective, and socially oriented forest management. Protection, maintenance, conservation of environmental values, avoiding the negative impact of economic activity on them is one of the components of the FSC (Forest Stewardship Council) principles, criteria, and indicators on which the FSC national standards are based [2; 3]. In Ukraine, this is the FSC National Forest Stewardship Standard of Ukraine (hereinafter – FSC national standard for Ukraine) [4]. As of October 2022, 95 Ukrainian forestry enterprises holding FSC certificates are implementing it in practice [5].

Formality in the practical implementation of the requirements of the FSC national standard, conjuncture of management and production decisions, in contrast to the systematic implementation of requirements, orientation to safety and risk-oriented approaches, are unacceptable from the standpoint of achieving the goals of responsible forestry. In terms of environmental values, the formality of management approaches can have both short-and long-term consequences that will lead to losses in environmental quality, deterioration of biodiversity, and a decrease in the potential of ecosystem services. That is why proper integration of forest certification standards, in particular, the FSC national standard for Ukraine, into the management system of forestry enterprises, systematic implementation of its requirements, focus on preventing any negative potential consequences – all this is evidence of maintaining the values of forest certification and environmental and social responsibility of forest owners and forest users.

The purpose of the study was to substantiate the theoretical and practical foundations of integrating the requirements of FSC certification in terms of environmental values into the management system of forestry enterprises.

The objectives of the study were:

– to define the concept of environmental values in FSC certification requirements;

– to systematise management approaches at forestry enterprises as a basis for responsible forestry management;

– to substantiate the mechanism for integrating environmental values as requirements of the FSC certification standard into the management system of forestry enterprises based on the development of appropriate management and production processes and procedural documentation.

The originality of the study consists in improving approaches to the management of forestry enterprises based on a well-founded mechanism for integrating forest certification requirements in terms of environmental values into the management system. Such a mechanism defines the requirements of forest certification not as additional to conventional forestry practices, but as the basis of management at the enterprise in accordance with the system, process, adaptive and risk-based approaches on which the FSC principles, criteria, and indicators of the forest management system are based.

Literature Review

A number of studies are devoted to the practical implementation of forest certification standards. They primarily reflect certain aspects of the impact of forest certification on the environment and society. For example, the authors of [6] evaluated the contribution of forest certification under the FSC scheme to biodiversity conservation using the example of such countries as Finland, Sweden, Estonia, and Latvia. Researchers argue the positive impact of FSC requirements on biodiversity conservation and their greater directivity in comparison with the national legislation of countries [6].

Using the example of forests of individual countries of South-Eastern Europe (Bosnia and Herzegovina, Croatia, Serbia, Slovenia), the authors of [7] investigated the impact of forest certification under the FSC scheme on ensuring sustainable management of state forests. Based on an analysis of the inconsistencies noted in publicly available certification assessment reports and a survey of those responsible for forest certification in forestry enterprises, the researchers concluded that forest certification has a positive impact on forest management practices and sustainable forest management, especially in terms of environmental and social aspects.

An assessment of the economic consequences of forest certification under the PEFC (Programme for the Endorsement of Forest Certification) scheme on the example of Spain is carried out in [8]. Although the researchers have not confirmed the impact of forest certification on improving financial performance, it is noteworthy to quantify the impact of forest certification on the profitability and turnover of companies.

The participation of communities in the management of FSC-certified and non-certified forest plantations on the example of Mozambique is considered in [9]. In general, the results show the importance of forest certification as a market tool for ensuring responsible forestry management.

P.G. Lemes, J.C. Zanuncio, L.A.G. Jacovine, C.F. Wilcken, S.A. Lawson assessed the impact of a number of certification schemes, including FSC, on the practice of integrated pest protection using the example of Australia [10]. In particular, they focused on the requirements for chemical pesticides prohibited by FSC. The researchers noted the positive impact of FSC certification on the integrated plant protection system against pests and emphasised the costs that accompany compliance with certification requirements.

The authors of [11] concluded that forest certification under the FSC scheme has a positive impact on fauna biodiversity based on a study conducted in Peru. The researchers made a conclusion based on a comparison of such effects in reference FSC-certified sites and those that did not have this status.

The impact of FSC certification on the Italian forest industry was investigated in [12]. The researchers considered such a tool in the context of responsible forest management and traceability of product origin. For a number of reasons for the introduction of FSC certification by Italian forest industry enterprises, the researchers noted the possibilities of expanding business relations between enterprises with an increase in product sales volumes in the future. This allows partially compensating for the operating costs of enterprises necessary to ensure compliance with FSC requirements.

A number of studies were devoted to FSC certification of ecosystem services [13-15]. In particular, the study [14] explored the capabilities of key stakeholders of the FSC certification system in terms of their ability to integrate forest ecosystem services: the capabilities of auditors for conformity assessment, national partners of FSC – for training activities, holders of FSC certificates – in terms of their experience in managing forest ecosystem services.

The paper [13] presents the results of a study of the demand for FSC certification of forest ecosystem services, considering the benefits and costs of certification of such services. The authors identified a number of factors that are important for stimulating the development of certification of ecosystem services (for example, price premium, expanding access to the global market, etc.), and outlined the challenges that are associated with this.

It is also worth noting the line of research that concerns the assessment of compliance with the requirements of forest certification standards. This area is important for continuous improvement of farming practices, considering the results of the assessment [16-18]. In particular, the authors of [16] determined factors affecting the characteristics of non-compliance with FSC requirements identified during the certification audit process. Such a study is important in terms of improving the effectiveness of FSC certification procedures and improving their quality.

The study [17] analyses non-compliance with FSC requirements identified by certification bodies in the audit process at the level of forestry management units in Indonesia. The researchers focus on finding the characteristics of forestry management units that affected the classes of corrective action requests and the time required to close them.

The study described in [18] concerns the field of activity of auditors who assess FSC compliance with the Brazilian standard. The researchers, among other things, draw attention to the significant number of minor non-conformances with the FSC standard for Brazil found in certified enterprises, especially in terms of social, legal, and environmental indicators. The conclusions of the study [18] relate to the areas of improving the quality of certification in terms of the process of assessment by certification bodies of compliance with the requirements of FSC standards, considering their regulatory framework.

Despite the best practices on forest certification, system approaches to the implementation of its standards based on the establishment of appropriate management and production processes and their proper support (documentary, organisational, etc.) require attention.

Materials and Methods

The study was based on general and special methods. In particular, methods of analysis, synthesis, generalisation, and comparison were applied to perform tasks in terms of defining the concept of environmental values in the requirements of FSC certification. The system analysis is used to outline approaches to management at forestry enterprises in accordance with the principles of responsible forestry. Based on the process approach, the management and production processes necessary for integrating environmental values into the management system of forestry enterprises are substantiated.

Obtaining scientific results required the following sequence of actions:

– generalisation and systematisation of requirements for environmental values as a component of the FSC national standard for Ukraine [4], which are reflected both in Principle 6 and in other principles of the standard in the context of avoiding negative impact on them, preventing and minimising risks;

– analysis of basic management approaches required for FSC-certified forestry enterprises (system, process, adaptive, risk-based) as a theoretical basis for making decisions on integrating environmental values into the management system;

– substantiation of the components of the mechanism for integrating environmental values into the management system of forestry enterprises at the managerial and production levels;

– identification of processes and their documentation on the example of environmental values as an element of integrating requirements into the management system of forestry enterprises.

The study was based on the requirements of the FSC National Forest Stewardship Standard of Ukraine [4]. The theoretical basis of the international standard ISO 9001:2015 "Quality Management Systems" is also used in terms of its process approach, the PDCA cycle ("Plan–Do–Check–Act") [19], and risk-based thinking, which is important for ensuring a results-based system.

Results

To substantiate the principles of integrating environmental values into the management system of forestry enterprises, first of all, it is necessary to outline the essence and content of the concept of such values. In particular, in the FSC national standard for Ukraine, environmental values are understood as elements of the biophysical and human environment, which include: ecosystem functions; biological diversity; water resources; soils; atmosphere; landscape values (in particular, cultural and spiritual values). The concept of environmental values implemented in this standard is aimed at protecting, maintaining, and conserving all components of such values.

According to the FSC national standard for Ukraine, the concept of environmental values consists in [4]:

– identifying and assessing environmental values;

– determining and evaluating the impact of economic activity on environmental values;

– preventing negative impacts of economic activity on environmental values, mitigating and correcting the impacts that have occurred.

The concept is implemented at the following stages: management planning; practical implementation of the plan in terms of reforestation, use of forests, their conservation and protection; monitoring. The concept covers the processes of analysis, evaluation, adjustment and adaptation of farming in accordance with the results obtained (the consequences of implemented decisions) and considering changing conditions (Fig. 1). The concept of environmental values is based on a risk-based approach and the precautionary principle in decision-making.

Achieving the goals for elements of environmental values requires appropriate economic measures both in forests that have operational (commercial) significance, and in relation to specific objects that have a protected status and are part of the conservation areas network of forestry enterprises. In the context of the concept of environmental values, such measures will contribute to the maintenance and conservation of values:

– ensuring sustainable forest use (both in terms of wood and non-wood forest resources);

– timely restoration of vegetation cover after harvesting and the use of ecologically well-adapted species to the conditions of the site, including native species;

– application of forestry practices that meet forest conditions and management goals (for example, leaving dead and decaying biomass in areas after harvesting and conserving forest structure).

The conservation areas network includes those areas for which conservation is the primary or sole purpose. Such a network is established from representative sample areas, conservation zones, protection areas, connectivity areas, and high conservation value areas. In addition to the territories that make up such a network, the FSC national standard for Ukraine defines approaches to their identification by enterprise, protection, conservation, management, and monitoring. At the same time, the standard provides for the active conservation and maintenance of the territories that make up the conservation areas network based on preventive measures within the framework of economic activities. If necessary, passive conservation is also applied (in particular, the prohibition of economic activity), if this is required either by the protected status of the territory or object defined by law, or by the selected regime for the components of the network in accordance with a certain purpose in relation to them.

Interaction with stakeholders (informing and engaging in decision-making) is an integral part of the concept of environmental values. For example, stakeholder consultations are seen as a source of the best available information to identify environmental

values (e.g. rare and threatened species and their habitats; native ecosystems; high conservation values). Stakeholder engagement is provided for the process of developing strategies and measures to maintain and/or enhance high conservation values and monitor them [20-22]. At the same time, holders of FSC certificates in accordance with the requirements of the FSC national standard for Ukraine have obligations to interact with interested parties within the limits within which the activities of enterprises affect the rights of these parties. Thus, interested parties can express their interests in relation to the activities of an FSC-certified enterprise and demand compliance with their legal rights. However, they may not require the right to grant, modify, or suspend or revoke a business permit by a certified enterprise [22].

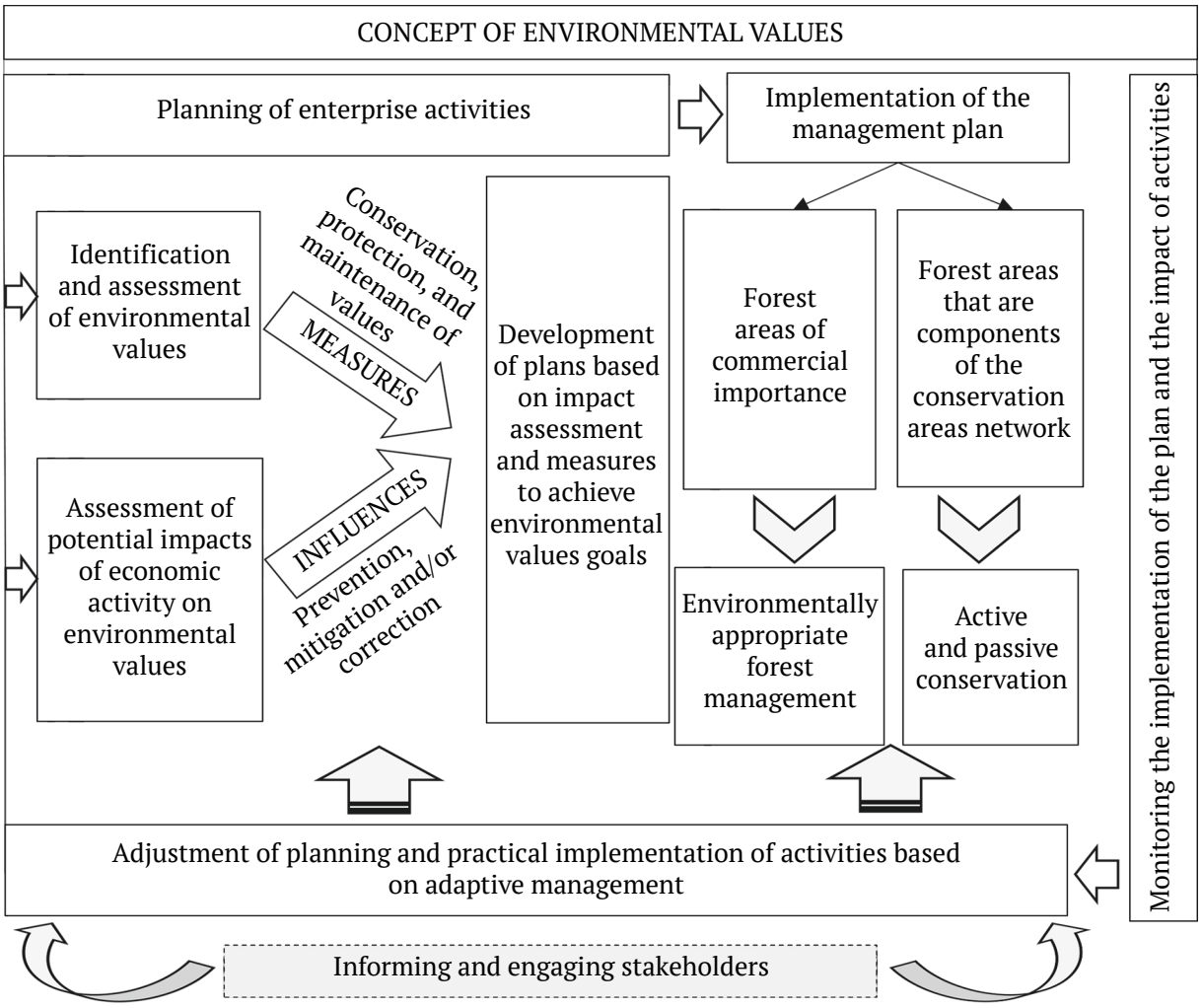

Figure 1. The concept of environmental values in the FSC National Forest Stewardship Standard of Ukraine
Source: developed by O.P. Pavlishchuk based on [4]

Thus, the above review of the concept of environmental values shows that its proper practical implementation requires both appropriate production practices and management approaches in forestry enterprises (Figure 2).

In terms of production activities, all its stages should be guided by the requirements of the FSC national standard for Ukraine, namely, in the process of reforestation, care of forest stands, harvesting, and protection of forests from pests and diseases. The requirements that need to be guided in production activities, among other things, relate to preventing negative impacts on environmental values, ensuring their conservation and protection. This is especially relevant for rare and threatened species and their habitats; representative sample areas; native species and genotypes (as opposed to alien species that may have invasive impacts); and natural watercourses and other

water bodies. The standard attaches importance to the issues of minimising and/or avoiding the use of fertilisers, pesticides, and biological control agents. The development of infrastructure and the transportation process should also consider the need to protect and conserve environmental values. Thus, the practice of forestry should be consistent with the goals of forest management, be responsible and close to nature.

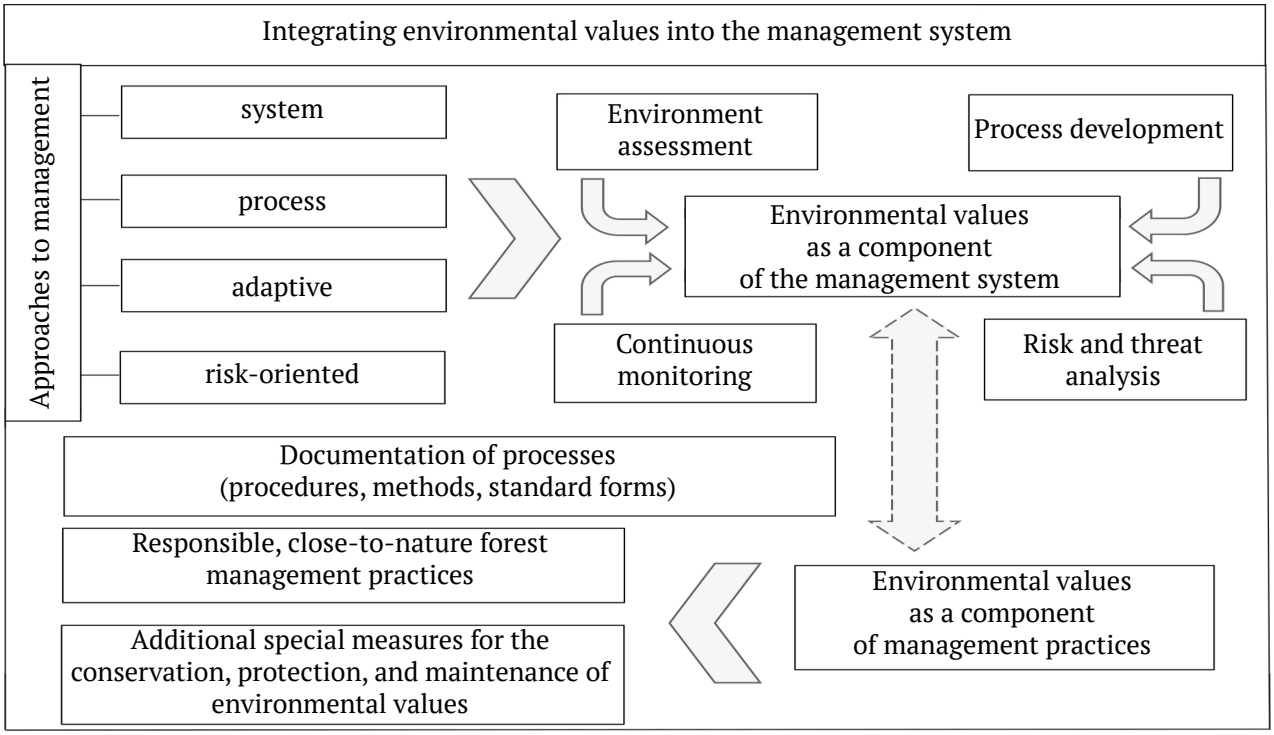

Figure 2. Components of the mechanism for integrating environmental values into the management system
Source: developed by O.P. Pavlishchuk based on [4]

As for the management component, first of all, the proper implementation in practice of the principles, criteria, and indicators of the FSC national standard for Ukraine requires enterprises to have an appropriate management system based on system, process, adaptive, and risk-oriented approaches. The use of the precautinary principle in decision-making is a tool to avoid negative impacts on environmental values during economic activity.

Regarding the theoretical foundations of integrating environmental values into the management system, it is worth noting first of all the importance of a system approach in the management of forestry enterprises. According to this approach, forestry enterprises are considered in the unity of their components – factors of the internal environment (goals and objectives, structure, technologies, resources) and in relation to the external environment. Interdependence of elements of the enterprise environment (external and internal), understanding the contribution of each of them to the characteristic of the whole and orientation on achieving goals under changing conditions is the basis of a system approach. Transformation of resources obtained from the external environment on the basis of appropriate internal processes is carried out in order to obtain economic, social and other results of activity.

These theoretical foundations confirm the importance of constant analysis of factors of the external and internal environment of enterprises in their interrelation, assessment of the impact of changes, determination of potential consequences of strategic, tactical, and operational decisions to preserve the integrity of the system and ensure its efficiency and effectiveness.

Integration of environmental values into the management system requires the use of a process approach in enterprises, which consists in presenting them as an integral system through the prism of interrelated processes. To achieve the planned result, it is necessary to define and implement appropriate processes at the management and production levels and consider their interaction and resource support.

The process approach is the basis of the international standard ISO 9001 "Quality Management

Systems" [19]. PDCA cycle (*Plan–Do–Check–Act*) – according to this standard, is a tool for managing processes and the system in general. The implementation of the process approach requires defining the goals of the system, developing processes, determining the necessary resources for obtaining results, identifying, analysing, and assessing risks. A component of the process approach is monitoring, analysing and evaluating processes and performance from the standpoint of the company's policy and plans. Adjusting plans, identifying opportunities and ways to improve the future, considering the business environment of enterprises, is also a component of the process approach in management. At the same time, the quality result depends on the quality of each process: from collecting initial information to implementing the plan and evaluating its implementation with further adjustments.

A risk-based approach is essential to prevent undesirable consequences. It is necessary to better understand the business environment and identify factors that may have negative impacts on processes and the management system in general. This approach increases the effectiveness of the system by avoiding potential negative impacts on it.

Integration of a risk-based approach into the management system is carried out at the stage of planning and implementing processes to reduce the negative impact of uncertainty, increase the capabilities of enterprises, and increase the efficiency of their activities in a dynamic environment.

An adaptive management approach is important for the proper response to the dynamism of environmental conditions. A component of this approach is the analysis and assessment of the company's business environment, its strengths and weaknesses, threats and risks. According to the adaptive approach, the company's activities, results, and processes should be constantly monitored. Based on the analysis and assessment of the environment and monitoring, decisions are made on the appropriate modification of the management system, adjustment of decisions to achieve the goals set.

The stages of adaptive management are: planning, implementation of activities, monitoring, evaluation and, if necessary, appropriate adjustment of management plans and practices. The key to adaptive management is the openness and transparency of the decision-making process through the participation of stakeholders at all stages.

Adaptive management is especially important in the context of climate change, which requires appropriate adaptation both in terms of management and forest use practices. For example, these questions are the subject of study by many researchers, in particular, J. Hörl, K. Keller, R. Yousefpour (exploring adaptive forest management strategies in the context of climate change) [23], J. Thomas, M. Brunette, A. Leblois (focusing on the decision-making process of private forest owners regarding the adaptation of forestry to climate change) [24].

Thus, the success of the implementation of FSC principles, criteria and indicators of responsible forestry in general, depends on the orientation of the company's management to the approaches described above, aimed at establishing a sustainable and viable system. Successful integration of environmental values as a requirement of the FSC national standard for Ukraine into the management system will require its appropriate modification in terms of processes, procedures, responsibility, and documentation.

Thus, the components of the mechanism for integrating environmental values (the element of the FSC national standard for Ukraine) into the management system are:

– establishment of management of forestry enterprises based on system, process, adaptive, and risk-based approaches, which are the basis for making effective and efficient decisions aimed at the long-term development of enterprises;

– development of processes covering applicable requirements for environmental values at the management and production levels;

– documentation support, in particular, the development and implementation of procedures and methods that determine the sequence of actions, responsibility, and other components necessary for the protection, conservation, and maintenance of environmental values to be systematically implemented in the practice of the enterprise.

As for the first component of the mechanism, it is important to realise that the long-term development of forestry enterprises requires their orientation to ensure environmentally balanced, cost-effective, and socially useful forestry, considering a wide range of forest values and their importance in countering global environmental threats. This requires a transformation of conventional approaches and an informal approach to forest management in compliance with applicable legislation, where specific practical solutions consider economic, environmental, and social components.

According to the second component of the above-mentioned mechanism, the implementation of the concept of environmental values requires the

introduction of appropriate processes at the management and production levels of forestry enterprises, which cover, in particular:

1. Identification of elements of environmental values.

2. Definition of a goal for elements of environmental values, considering the requirements of the standard for their conservation, protection, maintenance, and/or enhancement.

3. Determination of decision-making criteria for elements of environmental values that correspond to the set goal.

4. Assessment of elements of environmental values (for example, for their vulnerability, sensitivity to various types of impacts, rarity, etc.).

5. Assessment of the impact of economic activities on environmental values, identification of threats and risks to them from anthropogenic, abiotic, and biotic factors.

6. Development of strategic, tactical, and operational measures to achieve certain goals regarding the elements of environmental values with their reflection in the company's plans (implementation of measures in the planned activities of the enterprise).

7. Implementation of measures to achieve the goals of elements of environmental values at the strategic, tactical and operational levels at various stages of forestry activities (implementation of measures in forest management practices).

8. Monitoring the state of elements of environmental values, implementation of strategic, tactical, and operational measures and their effectiveness in achieving certain goals.

9. Reviewing, adapting, and adjusting strategic, tactical, and operational measures to conserve, protect, maintain, and/or enhance elements of environmental values in accordance with the monitoring results and considering changing conditions (both at the planning and business operations stages).

10. Informing and engaging stakeholders in activities related to identifying, evaluating, developing measures and monitoring environmental values (the process of interaction with stakeholders).

An integral part of the processes of developing and implementing measures at different levels regarding environmental values is to prevent negative impacts of economic activities on them, or to mitigate or correct those impacts that have already occurred. In addition, one of these measures should be to prevent illegal or unauthorised activities (for example, collecting rare and threatened species, poaching, etc.).

All the above-mentioned processes actually complement those that are more general in nature and are related to appropriate practices for the use of forests, their regeneration, protection, conservation. Notably, processes regarding environmental values relate to both forest and non-forest ecosystems (for example, the requirements for identifying native ecosystems, their representative areas and implementing appropriate measures for them are set out in Principle 6 of the FSC national standard for Ukraine [4]).

As for documenting the integration of environmental values into the management system, the current practice of forestry enterprises contains only some of its components. In particular, such components include: forest management plan and other forest management materials; files of forest mensuration; provisions and protection obligations for nature reserve fund objects of Ukraine (those located on the territory of a forestry enterprise); nature chronicles for nature conservation agencies, whose land border on the territory and / or located within the management unit without removal from the permanent user (this applies to national nature parks, biospheric, nature reserves, etc.). Moreover, documentary support covers materials of environmental impact assessment, which is carried out by forestry enterprises in accordance with the law of Ukraine "On Environmental Impact Assessment" [25]. However, this and other industry documentation of forestry enterprises do not provide proper documentary support for the integration of environmental values into the management system in accordance with the requirements of the FSC national standard for Ukraine. Thus, additional documentation is required, namely:

– the procedure for assessing environmental values (among other things, it should define the goals and objectives in this area, regulate the responsibility of employees, outline the methodology for identifying and evaluating environmental values with the necessary level of detail sufficient for further monitoring of the impact of activities);

– the procedure for assessing the impact on environmental values (among the general components, such as the goal, objectives, should contain the procedure for employees to assess the impact on values with the regulation of responsibility of each of them; appropriate lists of typical economic measures that may have a potential impact on environmental values, a description of typical impacts, and measures aimed at preventing and mitigating them);

– the standard forms necessary to reflect: the list of values, their characteristics, compiled based on

desk and field study; the results of assessing the potential impact of economic activity on environmental values at a reasonable level (forest plot, compartment, etc.) indicating the degree of such impact, and a description of the necessary measures to avoid or mitigate it; the results of monitoring the state of environmental values, the effectiveness of implemented measures for them in accordance with the goals set; the results of interaction with stakeholders on issues related to environmental values.

Documenting the integration of environmental values into the management system also requires appropriate training programmes that promote the proper professional competence of employees. The procedure for the engagement of stakeholders in planning and monitoring the management activities of a forestry enterprise is important.

Proper integration of environmental values into the management system of forestry enterprises is a testament to their responsibility to society and the environment, and a guarantee of increasing their contribution to mitigating global threats. At the same time, the FSC national standard provides opportunities for forestry workers to reach their potential in terms of making decisions about environmental values, without imposing specific options for action, defining only the framework of permitted and necessary activities. The systematic practice of implementing requirements for environmental values makes them an integral part of responsible management and evidence of commitment to forest certification values.

Discussion

The study results should be considered in the context of existing developments of researchers in the field of forest certification. Most scientific research in this area concerns the impact of forest certification on certain elements of the forest management system of enterprises that hold certificates, and related to the general impact of forest certification on the environment and society. In particular, the practical implementation of FSC certification requirements is considered in the context of economic, environmental, and social aspects of forest management: biodiversity conservation [6; 11], ecosystem services [13-15], integrated plant protection against pests [10], ensuring traceability of the forest product supply chain [12], relationships with stakeholders as participants in the forest certification system [21; 22].

The positive impact of forest certification on the competitiveness of forest industry enterprises, which is demonstrated on the example of Italy [12], generally allows asserting the possibility of improving the image of certified enterprises as environmentally and socially responsible organisations, including the possibility of expanding their sales markets for forest products, for which the independent party has confirmed the constancy of origin. This is an economic advantage of forest certification. Positive are the opportunities for forest certification based on the relevant requirements of FSC principles, criteria and indicators [2; 3] to influence the increase of public awareness about forests and forestry management, strengthening the engagement of stakeholders in the planning and monitoring processes at forestry enterprises, as discussed in [21; 22]. This is considered by the researchers as a social component of the practical implementation of forest certification requirements for conflict prevention in relation to forests and forestry management.

Considering the requirements of the FSC principles, criteria, and indicators [2; 3], it is possible to generalise the environmental benefits of their implementation by enterprises, which include: maintenance and conservation of biodiversity, forest ecosystem services and other elements of the environment, ensuring the sustainability of forest use, avoiding or minimising the negative impact on the environmental values of economic activity. The social benefits of forest certification, in addition to those mentioned earlier, also include ensuring compliance with the legal rights of workers, occupational health and safety in forestry, and avoiding gender inequality and discrimination on various grounds. Strengthening engagement with stakeholders, particularly local communities, is an element of socially beneficial management as a goal of forest certification.

Attention in scientific research to the procedures for assessing compliance with the requirements of forest certification standards, as done in [16-18], is conditioned by the importance of this component in the context of ensuring the integrity, openness, and transparency of the certification system. The context of these publications emphasises that the assessment of compliance with FSC requirements in the framework of certification audits, in addition to the control function, plays an important role in identifying weaknesses in the forest management system and contributes to the development of specific areas and actions for improving responsible forestry practices.

Thus, all these areas of scientific research are important both in general for improving the forest certification system at the level of its various participants (certificate holders, stakeholders, certification

bodies, national partners of FSC in countries), and for the proper practical implementation of the requirements of FSC principles, criteria, and indicators [2; 3]. However, most studies consider forest certification as a market tool for responsible forestry in the context of its external influences on the environmental, economic, and social components of the forestry management system. At the same time, existing studies focus to a lesser extent on the role of forest certification as a tool for improving the management system of forestry enterprises in terms of processes, procedures, and methods. They should be considered as components of the internal environment of forestry enterprises, which strengthen it and contribute to the production of positive internal and external effects.

This paper, as well as the studies by the above-mentioned researchers, concerns the possibilities of the positive impact of forest certification under the FSC scheme on the conservation, protection, and maintenance of environmental values. However, in this study, unlike others, forest certification is considered as the basis of management of forestry enterprises, considering system, process, adaptive, risk-oriented approaches and other elements of the mechanism for integrating its requirements into the decision-making system. The precautionary principle in FSC principles, criteria, and indicators [2; 3] determines the appropriate process of making managerial and production decisions, taking into account the possible impacts of economic activity, and estimated potential risks for achieving goals. Appropriately developed, implemented, and documented processes for planning and organising the activities of forestry enterprises, monitoring, evaluation, and adaptation would contribute to the growth of the contribution of FSC certified forestry enterprises to ensure environmentally appropriate, economically viable and socially beneficial forest management for present and future generations.

Conclusions

The presented substantiation of the principles of integrating environmental values into the management system of forestry enterprises in accordance with the requirements of forest certification allows drawing the following conclusions:

– the concept of environmental values is an integral part of the FSC principles, criteria, indicators, and the FSC national standard for Ukraine developed on their basis; reflecting the environmental component of responsible forestry, this concept defines the necessary areas of activity for the conservation, protection, and maintenance of various elements of environmental values both within the framework of general forest management practices and within the framework of those special additional measures necessary to achieve their goals;

– the implementation of the concept of environmental values in the context of its components to identify such values, assess them, determine the potential impact of economic activity on them and, accordingly, the development and implementation of measures to prevent such impacts or mitigate them, conserve and maintain values, requires appropriate approaches to both the management system and practical activities;

– the mechanism for integrating environmental values into the management system is based on such basic approaches to management as system, process, adaptive, risk-oriented, which create the basis for making and implementing effective and effective decisions in management;

– the possibilities of modifying the management system and forest use practices in terms of integrating environmental values are determined by: systematic analysis of the external and internal environments of the enterprise in the relationship of their factors; flexibility of management and production processes developed in accordance with the set goals; systematic assessment of potential risks and threats to the implementation of these processes; constant monitoring of the company's activities;

– the development of processes in accordance with the applicable requirements of forest certification for environmental values at the management and production levels, and their documentary support in the form of procedures, methods, standard forms of accounting and reporting are integral components of the successful integration of requirements for environmental values into the management system and practice of the enterprise;

– the processes regarding environmental values, considering the applicable requirements in the FSC national standard for Ukraine, should reflect the identification of environmental values, assessment of the impact on them, development of measures in accordance with the goals set for their conservation, maintenance, protection, monitoring their condition and measures, and adjustment if necessary;

– proper interaction with stakeholders as one of the processes related to environmental values will contribute to the balance of environmental, economic, and social interests, avoiding social tension and possible conflict situations around issues related to environmental values.

The research prospects are further related to the assessment of the requirements of the concept of environmental values in accordance with the principles, criteria, and indicators of forest certification in the context of applicable country legislation. It is also necessary to substantiate the principles of better integration of the concept of environmental values into forestry practices at the level of specific measures for elements of such values.

References

[1] Sustainable development goals. (n.d). Retrieved from https://www.un.org/sustainabledevelopment/.

[2] FSC Principles and criteria for forest stewardship FSC-STD-01-001 V5-2. (2015). Retrieved from https://connect.fsc.org/document-centre/documents/resource/392.

[3] International generic indicators FSC-STD-60-004 V2-0. (2018). Retrieved from https://connect.fsc.org/document-centre/documents/resource/262.

[4] The FSC National Forest Stewardship Standard of Ukraine FSC-STD-UKR-01-2019 V 1-0. (2019). Retrieved from https://fsc.org/en/document-centre/documents/resource/428.

[5] FSC Facts & Figures in Ukraine. (2022). Retrieved from https://ua.fsc.org/ua-en/fsc-facts-figures-in-ukraine.

[6] Lehtonen, E., Gustafsson, L., Lohmus, A., & Stedingk, H.V. (2021). What does FSC forest certification contribute to biodiversity conservation in relation to national legislation? *Journal of Environmental Management,* 299, article number 113606. doi: 10.1016/j.jenvman.2021.113606.

[7] Malovrh, Š.P., Becirovic, D., Maric, B., Nedeljkovic, J., Posavec, S., Petrovic, N., & Avdibegovic M. (2019). Contribution of forest stewardship council certification to sustainable forest management of state forests in selected Southeast European Countries. *Forests*, 10(8), article number 648. doi: 10.3390/f10080648.

[8] Zubizarreta, M., Arana-Landín, G., Wolff, S., & Egiluz, Z. (2023). Assessing the economic impacts of forest certification in Spain: A longitudinal study. *Ecological Economics*, 204(A), article number 107630. doi: 10.1016/j.ecolecon.2022.107630.

[9] Degnet, M.B., Werf, E., Ingram, V., & Wesseler, J. (2022). Community perceptions: A comparative analysis of community participation in forest management: FSC-certified and non-certified plantations in Mozambique. *Forest Policy and Economics*, 143, article number 102815. doi: 10.1016/j.forpol.2022.102815.

[10] Lemes, P.G., Zanuncio, J.C., Jacovine, L.A.G., Wilcken, C.F., & Lawson, S.A. (2021). Forest Stewardship Council and Responsible Wood certification in the integrated pest management in Australian forest plantations. *Forest Policy and Economics*, 131, article number 102541. doi: 10.1016/j.forpol.2021.102541.

[11] Campos-Cerqueira, M., Mena, J.L., Tejeda-Gómez, V., Aguilar-Amuchastegui, N., Gutierrez, N., & Aide, T.M. (2020). How does FSC forest certification affect the acoustically active fauna in Madre de Dios, Peru? *Remote Sensing in Ecology and Conservation*, 6(3), 274-285. doi: 10.1002/rse2.120.

[12] Galati, A., Gianguzzi, G., Tinervia, S., Crescimanno, M., & Veca, D.S.L.M. (2017). Motivations, adoption and impact of voluntary environmental certification in the Italian Forest based industry: The case of the FSC standard. *Forest Policy and Economics*, 83, 169-176. doi: 10.1016/j.forpol.2017.08.002.

[13] Jaung, W., Putzel, L., Bull, G.Q., Guariguata, M.R., & Sumaila, U.R. (2016). Estimating demand for certification of forest ecosystem services: A choice experiment with Forest Stewardship Council certificate holders. *Ecosystem Services*, 22, part A, 193-201. doi: 10.1016/j.ecoser.2016.10.016.

[14] Jaung, W., Putzel, L., Bull, G.Q., Kozak, R., & Elliott, C. (2016). Forest Stewardship Council certification for forest ecosystem services: An analysis of stakeholder adaptability. *Forest Policy and Economics*, 70, 91-98. doi: 10.1016/j.forpol.2016.06.004.

[15] Savilaakso, S., & Guariguata, M.R. (2017). Challenges for developing Forest Stewardship Council certification for ecosystem services: How to enhance local adoption? *Ecosystem Services*, 28, part A, 55-66. doi: 10.1016/j.ecoser.2017.10.001.

[16] Hălălisan, A.-F., Popa, B., Heras-Saizarbitoria, I., Boiral, O., Arana-Landin, G., Nicorescu, A.-I., & Abrudan, I.V. (2021). Procedural factors influencing forest certification audits: An empirical study in Romania. *Forests*, 12(2), article number 172. doi: 10.3390/f12020172.

[17] Hermudananto, R.C., & Ruslandi, P.F.E. (2018). Analysis of corrective action requests from Forest Stewardship Council audits of natural forest management in Indonesia. *Forest Policy and Economics*, 96, 28-37. doi: 10.1016/j.forpol.2018.07.012.

[18] Piketty, M.-G., & Drigo, I.G. (2018). Shaping the implementation of the FSC standard: the case of auditors in Brazil. *Forest Policy and Economics*, 90, 160-166. doi: 10.1016/j.forpol.2018.02.009.

[19] ISO 9001:2015. Quality management systems – Requirements. (2015). Retrieved from https://www.iso.org/standard/62085.html.
[20] Kravets, P.V. (Ed.). (2021). *Manual on the practical implementation of the FSC national forest stewardship standard of Ukraine*. Kyiv: FSC Ukraine.
[21] Pavlishchuk, O.P., & Kravets, P.V. (2020). Interactions with interested stakeholders in accordance with the FSC national forest stewardship standard of Ukraine. *Ukrainian Journal of Forest and Wood Science*, 11(1), 55-65. doi: 10.31548/forest2020.01.055.
[22] Pavlishchuk, O.P., & Storchous, O.V. (2021). *Forest certification according to FSC national forest stewardship standard of Ukraine: opportunities for stakeholders*. Kyiv: FSC Ukraine.
[23] Hörl, J., Keller, K., & Yousefpour, R. (2020). Reviewing the performance of adaptive forest management strategies with robustness analysis. *Forest Policy and Economic*s, 119, article number 102289. doi: 10.1016/j.forpol.2020.102289.
[24] Thomas, J., Brunette, M., & Leblois, A. (2022). The determinants of adapting forest management practices to climate change: Lessons from a survey of French private forest owners. *Forest Policy and Economics*, 135, article number 102662. doi: 10.1016/j.forpol.2021.102662.
[25] Law of Ukraine № 2059-VIII "On Environmental Impact Assessment". (2017, May). Retrieved from: https://zakon.rada.gov.ua/laws/show/2059-19#Text.

Інтегрування цінностей довкілля в систему менеджменту підприємств лісового господарства згідно з вимогами лісової сертифікації

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Анотація. Актуальність дослідження зумовлена важливістю належного застосування лісової сертифікації як інструменту відповідального лісогосподарювання. Відсутність інтегрованих в систему менеджменту підприємств підходів та формальності у реалізації вимог лісової сертифікації є неприйнятними з погляду інтересів суспільства та довкілля. Метою дослідження є обґрунтування теоретичних та практичних засад інтегрування цінностей довкілля, як однієї з вимог лісової сертифікації за схемою Лісової опікунської ради (Forest Stewardship Council), в систему менеджменту підприємств лісового господарства. Для дослідження використані загальні та спеціальні методи (аналізу, синтезу, узагальнення та порівняння), а також нормативну базу лісової сертифікації та стандарту менеджменту якості. В статті охарактеризовано концепцію цінностей довкілля у розрізі її складових. Обґрунтовано, що системний, процесний, адаптивний та ризик орієнтований підходи до менеджменту є основою інтегрування концепції цінностей довкілля в систему менеджменту підприємств лісового господарства. Визначено, що формування процесів, які охоплюють вимоги лісової сертифікації щодо цінностей довкілля та їх документальне забезпечення, є елементами механізму інтегрування цінностей довкілля в систему менеджменту. Такі процеси пов'язані з: ідентифікацією цінностей довкілля; визначенням мети та критеріїв прийняття рішень щодо них; оцінюванням впливу на них господарської діяльності; розробленням та впровадженням заходів для їх збереження, підтримання, охорони; моніторингом стану та заходів. Процедури, методика моніторингу, навчальні програми, типові форми обліку та звітності є складовими документального забезпечення зазначених процесів. Результати дослідження будуть корисними для удосконалення системи менеджменту підприємств лісового господарства згідно з вимогами лісової сертифікації в частині планування, організації, моніторингу та контролю. Реалізація окреслених для цього інструментарію та практичних кроків сприятимуть зростанню ефективності підприємств та їхній конкурентоспроможності на ринках, доступ до яких визначають вимоги щодо сталості походження лісопродукції

Ключові слова: елементи середовища, FSC стандарт, оцінювання відповідності, системний підхід до менеджменту, процесний підхід до менеджменту, адаптивне лісове господарство