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## Theoretical and Methodological Foundations of Provision of Well-Balanced Development of Forest Sector of Economy under the Conditions of Climatic Changes and Increase of Anthropogenic Stress

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**Abstract:**

*Current climatic changes are a threat to effective development of forestry under the modern economic conditions, which is aggravated by increase of anthropogenic stress in the sphere of forest use. Formation of strategies of well-balanced development of forestry supposes not only analysis of popular methodological approaches but formation of organizational mechanism for managing this sphere, the realization of which is aimed at preventive elimination of emerging threats. Provision of well-balanced development of economic system is viewed from the positions of the theory of management. The authors substantiate the use of complex approach which takes into account tendencies of functioning of forest sector, as a constant process of using forest resources, their preservation and renewal. Complexity will provide the study of the managed sub-system of forest complex (forestry) as totality, consisting of separate interconnected spheres of activities which possess their own functions and goals, with ordered and interconnected activities. Preventive approach will ensure timely revelation of key problems and threats to provision of well-balanced development of forest complex. Reflection will allow choosing the most effective instrumentarium for prevention (levelling) of emerging threats on the basis of existing experience. Balance of development is viewed as a feature peculiar for all structural components of economic system. It is advisable to distinguish the following factors which influence well-balanced development of region: group of natural and ecological, socio-political, economic, and social factors. Key components of provision of well-balanced development of economic system (forestry) could be presented from the positions of study, firstly, of managing and managed sub-systems; secondly, from the position of sub-system of forecasting, monitoring, identification, and evening-out of threats to well-balanced development.*

**Key Words:** forest sector, preventing management, well-balanced development.

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## **1. Introduction**

Formation of strategies of effective development of forestry and, as a result – increase of economic security of national economy in the sphere of forest use, based on reduction of climatic risks of development of forestry – supposes development of scientific methods of evaluation of risks, vulnerability, and potential advantages of predicted climatic changes in view of natural and geographic, economic, social, and other peculiarities of specific region or sphere of economy, as well as formation of differentiated multi-level mechanism of management of forestry, implementation of which is aimed not only at evening-out of emerging threats but at their preventive elimination. Under the modern conditions of economy, climatic changes are aggravated by strengthening of anthropogenic stress in the sphere of forest use (Konstantinov, 2014; Konstantinov, 2014).

The strategy of well-balanced development of forestry supposes not only analysis of well-known methodological approaches but formation of organizational mechanism of forestry management, implementation of which is aimed at preventive elimination of emerging threats (Osmanov et al., 2015).

## **2. Methods**

Generally, approaches to provision of well-balanced development of economic system, as to the management on the whole, are a totality of basic components: goals, principles, methods, and tools. For the purpose of this research, we shall view the provision of well-balanced development of economic system from the positions of the theory of management.

It should be noted that well-balanced development of forest sector supposes progressive qualitative and quantitative increase of indicators which characterize the functioning of key components of forest sphere of economy for satisfying needs of current and future generations in long-term on the basis of harmonization of interests of state, society, and nature. In this case, a very important role belongs to complex development of forest resources as a part of industrial (consumption of forest resources in agriculture and industry), recreational (park belt is a powerful reserve of clean air for a city; forest provides a visible recreational effect), and ecological (water protection, sanitary and therapeutic, field and soil protection) components (Zinovyeva, 2014).

Process approach. According to this approach, provision of well-balanced development is a constant process of managing the activities of forest complex. Functioning of forest complex could be presented as a constant process of use of forest resources and their recovery. On this basis, provision of well-balanced development requires revealing the tendency of system development, necessary expenditures of resources and time for effective use of forest, and its recovery. An important component for the use of this approach is revealing key processes in functioning and forecasting of dynamics of

development of forest sector. This very approach to management will allow determining relations and interdependencies in the development of forestry. This is caused by the fact that the quality of provision of effective functioning at one stage (for example, formation of saplings) will ensure effective development of economic system at the following stages (recovery forest fund – use of forest fund).

Systemic approach. Study of the possibility of providing well-balanced development requires not only consideration of the process of system functioning, but taking into account all factors that influence the development. In this case, forestry should be viewed as totality of interconnected elements (theory of management views departments, functions, processes, and methods). Regarding provision of well-balanced development of forest sector of economy, there are two variants of components: managing (public authorities and forest resources' users) and managed sub-systems (forest resources and forest resources' users – for public authorities). The second variant (narrow) supposes consideration of forest sphere as totality of sub-systems (recreational, raw materials, ecological, supplementary, etc.). The main emphasis during the use of systemic approach is put on the provision that any decision in managing sub-system, on the one hand, is determined by a range of influencing factors, and, on the other hand – will bear consequences for the whole managed sub-system (or for all components – of it is not oriented only at one of them). This approach to management, including provision of well-balanced development, allows avoiding situations when development of one component (for example, provision of effective use of timber) turns into a problem for another one (insufficient forest recovery and, as a consequence, reduction of forest area).

Situational approach. This approach emerged as the development of systemic approach which does not allow answering a question, why parameters and results of functioning differ in systems with similar structure. Situational approach supposes solving tasks of effective management, including provision of well-balanced development, from the positions of allocation and evaluation of specific situation in which the system develops. While in general theory of management, situational approach supposes concentration on situational differences, in case with forest sector of economy, an essential role belongs to two “situational” components: territorial – with two similar systems, territory on which forest areas are situated is very important (areas of forest resources location or regions in which they are used). At any rate, an important role belongs to climatic component which determines the quantity of existing forest resources (geographical forest cover of territory), their quality (type of timber and features of forest resources) and volume of expenses necessary for effective development (expenses for cutting, transportation, and recovery of forest resources).

Complex approach. The conducted research showed that each of the above approaches has its advantages and drawbacks (which are advantages for other approaches). The current situation requires using the complex approach which takes into account tendencies of forest complex functioning as a constant process of use of forest resources and their preservation and recovery (from the positions of process approach). Systemic component in complex approach is necessary, as the formation of strategy of providing

well-balanced development of forest sector should take into account all components of forest sector: forestry, lumbering industry, and timber processing industry. On the other hand, implementation of systemic approach supposes accounting of the influence of maximal range of factors during formation of strategy of well-balanced development of forest complex. Situational component of complex approach supposes accounting of specific situation (in this research -accounting of the factor of climatic changes and increase of anthropogenic stress), which is very important for well-balanced development and provision of economic security.

From the positions of effective implementation of complex approach, it is necessary to use reflection. Reflexive approach supposes flexibility and reactivity, i.e., an important role belongs to system's reaction to the influence of environment and managerial decisions. Under the modern conditions of economy, accounting of this reaction is very important, as it can be unpredictable and lead to unfavorable results. It should be noted that insufficient accounting of reflexive approach might cause faults, violations, and disability of economic system.

The most important criterion of classification of approaches to management is targeted orientation of managerial decisions. According to this criterion, there are reactive, active, and preventive approaches in system management.

Preliminary analysis of implemented approaches to management allowed substantiating complex preventive management, as a key one for provision of well-balanced development of forest sector of economy – it takes into account reflection of managed sub-system. Complexity will ensure consideration of managed sub-system (forestry) as a totality consisting of separate interconnected spheres of activities which have their own functions and targeted settings, with ordered and interconnected functioning. Preventive approach will ensure timely determination of key problems and threats to provision of well-balanced development of forest sector. Reflection will allow choosing the most effective instrumentarium for prevention (levelling) of emerging threats on the basis of existing experience.

### **3. Results**

In most cases, balance of development is viewed as feature peculiar for all structural components of economic system (Uskova, 2010). In our opinion, there is a necessity for wider approach and it is advisable to allocate groups (clusters) of factors influencing the well-balanced development of region: group of natural and ecological factors; group of socio-political factors; group of economic factors; group of social factors.

Group of natural and ecological factors predetermines sectorial specialization of region, as well as spatial distribution of resources and level of expenses, necessary for socio-economic development of territory. Also, these factors determine ecological limitations for development of economy.

Socio-political factors determine the possibilities for setting connections between entrepreneurs, employees, and society for the purpose of effective decisions for well-balanced development. Also, this group of factors influences the determination of possibilities and provision of decisions, as it uses budget assets.

An important role belongs to economic factors which determine the sphere of region's specialization, influence transregional connections, possibilities of implementation of innovations and attraction of investments, and influence the possibilities of financing of enterprises, organizations, and region on the whole.

The last component of well-balanced development – social one – determines the group of social factors which are important for development, namely influence on forms of employment and income of population, labor efficiency, and possibility for reproduction of labor resources.

It should be noted that public authorities of the RF subjects can influence factors of well-balanced development and should take them into account during formation of region's policy. The group of natural and ecological factors cannot be influenced by public authorities, but they have to take them into account during formation of industrial, ecological, and social policy. Thus, well-balanced development of economic system is well-balanced development of its economic, social, and ecological sub-systems for the purpose of satisfaction of needs of current and future generations in long-term on the basis of harmonious combination of interests of state, society, and nature.

The table shows proprietary interpretation of classification of components of well-balanced development of economic system as to various features.

According to the offered classification, development of forest sector should be conducted in view of the whole complex of direction of development, providing the balance of economic, financial, social, and budget components. Character of system formation should be based on: state regulation of development of forest sector; development of business activities in the sphere of forest resources use and recovery; development of neighboring spheres and productions on territories which have a lot of forest resources. In order to implement the offered components of provision of well-balanced development of forest sector of economy, it is necessary to organize concerted work of regional authorities and business structures, aimed at preservation, effective use, and recovery of forest resources.

For the purpose of timely and flexible reaction of managerial system to changing conditions of economy (reflection), it is offered to use criteria of short-term, long-term, and mid-term planning of well-balanced development, as a classification feature.

**Table 1.** Classification of parameters of well-balanced development of economic system

Classification feature	Components of well-balanced development
1. Direction of development	<ul style="list-style-type: none"> <li>– Economic;</li> <li>– Financial;</li> <li>– Social;</li> <li>– Ecological;</li> <li>– Budget.</li> </ul>
2. Character of formation	<ul style="list-style-type: none"> <li>– Balance of development, provided in natural way;</li> <li>– Balance of development, provided through targeted state regulation;</li> <li>– Balance of development, provided as a result of work of mechanism of public-private partnership.</li> </ul>
3. Time factor	<ul style="list-style-type: none"> <li>– Long-term well-balanced development;</li> <li>– Mid-term well-balanced development;</li> <li>– Short-term well-balanced development.</li> </ul>
4. Role of subjective factor	<ul style="list-style-type: none"> <li>– Well-balanced development, achieved by objective factors only;</li> <li>– Well-balanced development, achieved by subjective influence;</li> <li>– Well-balanced development, achieved by synthesis of objective and subjective factors.</li> </ul>
5. Possibility for quantitative evaluation	<ul style="list-style-type: none"> <li>– Well-balanced development, evaluated quantitatively with the help of economic and mathematical methods;</li> <li>– Well-balanced development, evaluated on the basis of synthesis of economic &amp; mathematical and expert methods;</li> <li>– Well-balanced development, the level of which cannot be evaluated quantitatively.</li> </ul>

At that, optimal decisions require analysis of objective and subjective factors which influence development and functioning of the system (forestry) on the whole. Evaluation of efficiency of reaction of organizational mechanism of managing forestry to emerging challenges (including climatic changes and growth of anthropogenic stress) requires scientific-based methods. At that, selection of the evaluation methods will depend on specific situation and case.

Thus, we shall view well-balanced development of economic system and its structural components from the positions of the most optimal (as to conditions of climatic changes and growth of anthropogenic stress) preventive management, taking into account reflection of managed sub-system.

On the basis of these positions, structure of key components of provision of well-balanced development of economic system (forestry), in view of possible threats, could be presented as the following scheme (Figure 1).

#### **4. Discussion**

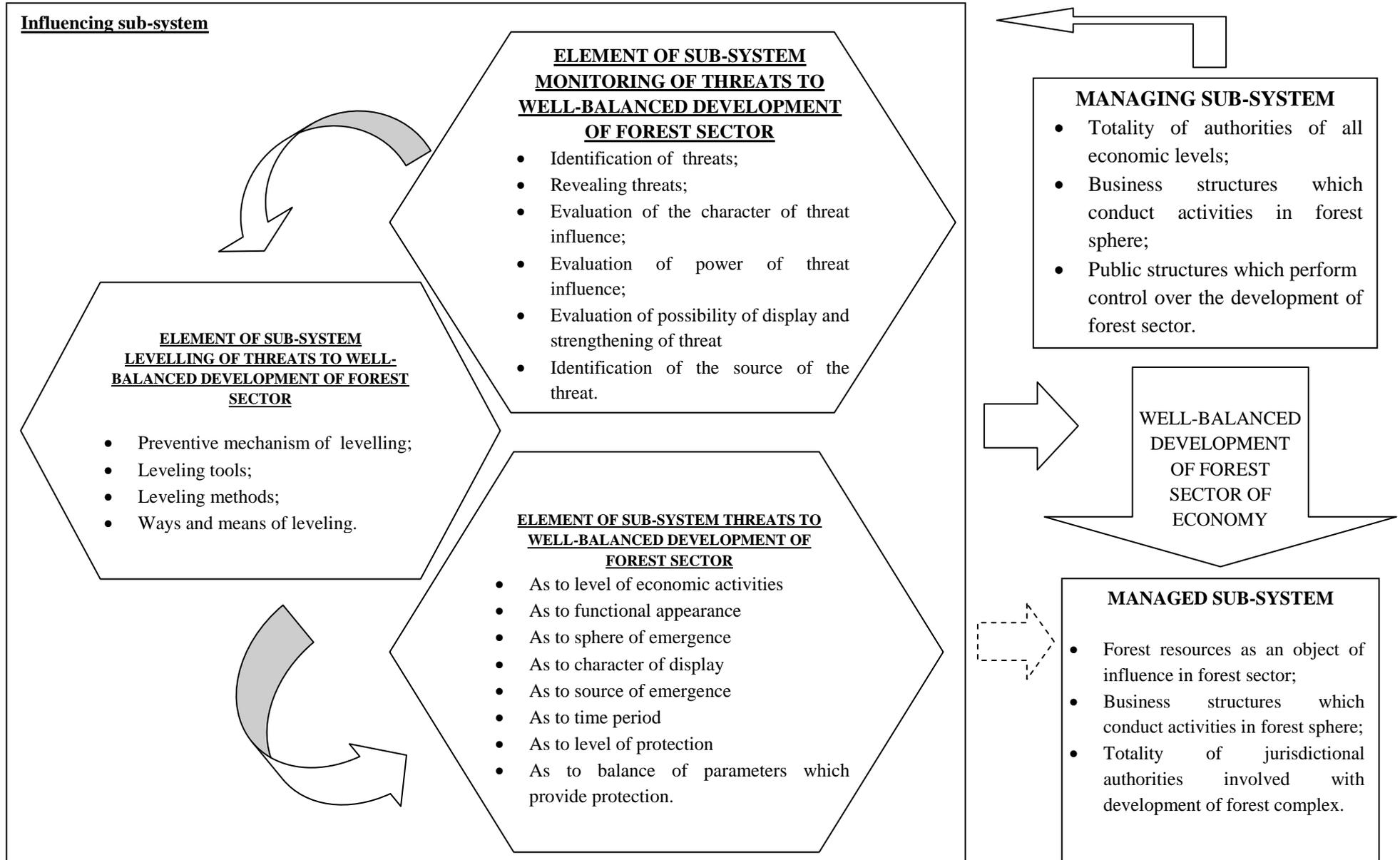
Algorithm of provision of well-balanced development of the forestry system (Fig. 1) consists of several blocks: managing sub-system which, through monitoring and regulation of elements of managing sub-system, influences the level of balance of development of forest sector of economy. It its turn, this influences the state of managed sub-system, i.e., the state of main resource base and state of things in business sector of the forest sphere.

Let us view the characteristics of its main components from the positions of necessity for provision of well-balanced development of the economic system on the whole.

Characteristics of managing sub-system. Well-balanced development of the sphere requires the creation of managerial and economic mechanisms which would lead the existing industrial and technological structure to the state that could ensure the sufficient level of social stability and economic growth, on the basis of true evaluation of natural and resource potential and in view of possible threats and determination of mechanisms of their levelling.

Characteristics of influencing sub-system. In the offered scheme (Fig. 1), the influencing sub-system is shown as interconnected structural elements: monitoring and allocation of possible threats, their structuring and possible levelling. Influencing sub-system on the whole should be viewed as managerial economic mechanism. Economic mechanism is economic system which is based on economic tools, ways, and leverages for influence on economic relations and processes which take place at corresponding level of management. Its formation and development is always connected to functioning of various organizational systems. Economic mechanism is a predetermined connected set of rules, the use of which leads to existing resources giving certain result. Despite a range of deep substantial works in the sphere of economic mechanism, many of its problems are not studied well. This is caused by the fact that economic mechanism is closely connected to the process of public reproduction in its specific historical conditions. At that, cardinal changes under these conditions significantly influence the formation of economic mechanism, thus modifying it.

**Figure 1.** Components of provision of well-balanced development of economic system (forest sector of economy)



Transition to well-balanced type of development requires implementation of corresponding economic mechanisms. Economic mechanisms in all spheres depend on economic policy of the state which is a totality of conducted measures of influence on economic processes for implementation of socially significant goals (Morkovina et al., 2014). In this case, top-priority role belongs to formation of economic mechanism of natural resource use, a sub-system of which is economic mechanism of forest management.

Economic mechanism of forest management is an open system which changes according to conditions of external environment. Elements of economic mechanism are criteria and indicators of well-balanced management of forests, information on forestry, pricing, types of rights for forest fund use, planning, stimulation, and financing. All elements are interconnected and interdependent.

One of the significant elements of influencing sub-system of characteristics of threats to well-balanced development of forest sector (managed sub-system). The factors that restrain development of forest sector are the following (Konstantinov, 2014):

- underdevelopment of transport infrastructure – primarily, absence of the network of forest roads of year-round use;
  - old and aged means of production;
  - absence of developed banking and fiscal system;
  - underdevelopment of trade infrastructure – primarily, weakness of internal market due to absence of consumer purchasing power;
  - underdevelopment of marketing for forest production;
  - low level of readiness of managing staff for work under new economic conditions;
  - defragmentation of forest fund between multiple tenants, the activities of which are aimed at export of round timber, which does not provide positive effect for economic development of regions, this hindering the investments into wood processing enterprises of the regions.
- Analysis of stated and revealed threats allows systematizing them as to the level of economic activities:
- forest resources as an object of influence in forest sector;
  - business structures which perform activities in forest sphere;
  - totality of jurisdictional authorities involved with development of forest complex.

Cooperation of various factors of well-balanced development of economic systems supposes comprehensive and harmonic state of region according to the set criteria: balance of material, labor, and financial indicators; fulfillment of obligations before state, population and partners; capability for performing expanded reproduction and long activities in view of dynamics of external environment, etc. This approach to cooperation of factors of well-balanced development has a systemic and constructive nature and is oriented at methods of coordination and management, allowing the object to ensure not only opposition to external challenges and internal risks, not only endurance and stability, but capability for deep changes, operative flexibility and adaptability to changing external and internal conditions.

This causes a single option necessity for managing factors of well-balanced development of economic systems, based on the totality of complex methods of regulation of all functional spheres and potential, aiming at preservation of necessary and sufficient reactions and transformations for provision of necessary indicators of region's existence in view of strategic perspective. Here, the main task of managing the processes of well-balanced development consists not only in bringing all risks and losses to the lowest level – this is impossible – but in forecasting and skillful use of development factors according to tendencies and regularities of external environment.

In particular, the level of well-balanced development of forest business sector is a result of combination of factors of external and internal environment of the region which positively or

negatively influence its economic activities and determine, for example, its competitiveness. When influencing sub-system directly influences the managing one (dotted arrow on Fig. 1), the issue of the well-balanced development of forest sector of economy is put into question.

Thus, during analysis of effectiveness of functioning and perspectives of development of forestry, it is necessary to pay close attention to factors which negatively influence indicators of well-balanced development of region (Goryanaya, 2013). These factors include factors of threats and factors of unpredictable nature. Provision of well-balanced development of economic systems should be viewed as solving a complex socio-economic, financial, and organizational task.

## **5. Conclusion**

Provision of well-balanced development of economic system was viewed from the positions of the theory of management. The conducted analysis showed that each of the used approaches has its advantages and disadvantages. The most optimal is the use of complex approach which included elements of all types of approaches and takes into account tendencies of functioning of forest complex as constant process of forest resources use, their preservation and recovery. Formation of the strategy of provision of well-balanced development of forest sector should take into account all components of forest complex: forestry, lumbering industry, and timber processing industry. Implementation of principles of systemic approach supposes accounting of the influence of maximal range of factors during formation of strategy of well-balanced development of forest complex. Situational component of complex approach supposes accounting of specific situation (in this research - accounting of the factor of climatic changes and increase of anthropogenic stress), which is very important for well-balanced development and provision of economic security. Sub-system's feedback to managing influence (reflection) is a necessary component of complex approach which allows evaluating its effectiveness.

The conducted analysis of implemented approaches to management in forest sector of economy that ensures well-balanced development of forest sector of economy allows substantiating complex preventive management which takes into account reflection of managing and managed sub-systems (forestry) as a totality consisting of separate interconnected spheres of activities which have their own functions and targeted settings, the functioning of which is ordered and interconnected. In its turn, preventive approach will ensure timely revelation of key problems and threats to provision of well-balanced development of forest complex, including conditions of climatic changes and anthropogenic stress. Reflection will allow choosing the most effective instrumentarium for prevention (levelling) of emerging threats on the basis of existing experience.

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