Internal ecological audit of environmental facilities of agricultural enterprises

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Abstract. The need for developing internal ecological audit as the most important tool for environmental safety and sustainable use of natural resources ensured by an economic entity has been justified. Special features - sectoral, technological, and organizational ones - of agricultural enterprises have been identified, and their impacts on setting and implementing the internal eco-audit system have been determined. Environmental premises and equipment of agricultural enterprises were selected as the audited entity. A comprehensive set of uniform standard procedures of internal eco-audit of fixed assets, including an audit agenda, control assessment of the assets’ availability, conditions, and movements at the enterprise, and identification of accounting areas of concern. The structure and internal regulations to audit environmental premises and equipment of agricultural enterprises have been developed. Forms of working audit documents have been proposed, and measurements have been determined. Organizational solutions to implement the internal eco-audit system for agricultural facilities have been proposed. Being implemented, the measures proposed ultimately ensure the long-term sustainability of agricultural development (without causing damage to natural resources or environment) and thereby contribute to an increase in the social significance of the agricultural enterprise, strengthening its business reputation and competitiveness.

1. Introduction

1.1 The problem background

Institutional transformations in the agro-industrial complex of the Russian Federation contribute to the formation of new organizational structures and create conditions for ensuring the food security, developing an effective import substitution policy, and strengthening the country’s economy as a whole. The food sovereignty of the Russian Federation is based on the State Program on Agribusiness Development and Regulation of Farm Produce, Raw Materials and Foodstuffs Markets [1], Food security doctrine of the Russian Federation [2], and Strategy for the Development of the Food Processing Industry of the Russian Federation until 2020 [3]. The import substitution policy in agriculture is founded on creating and stepping up farms in the Russian Federation.

Meanwhile, agriculture has a great impact on the environment. According to scientists of the Intergovernmental science-policy platform on biodiversity and ecosystem services (IPBES), more than
75% of fresh water is used for agriculture, including livestock; about 25% of land is occupied by pastures; and the production of food crops has grown by 300% since 1970 [4]. The Volgograd Region belongs to the agro-industrial regions of the Russian Federation. In 2019, agricultural land accounted for 80.8% of the entire territory of the region that was 9121.6 thousand hectares. The policy of the Volgograd Region authorities is aimed at a “breakthrough” development of the agro-industrial sector. The key areas in the regional agriculture are land reclamation, animal husbandry, and processing. Agricultural activity should be based on the principle of environmental protection, which assumes a minimum adverse impact on the ecosystem. Therefore the Volgograd region takes an active part in all regional projects within the national project “Ecology,” namely, “Improvement of the Volga-river,” “Clean country,” “Clean water,” “Integrated waste management system,” “Preservation of unique water bodies,” and “Preservation of forests” [5]. The total amount of funding for 2019 made more than 2.7 billion rubles. Growing environmental problems that are extremely important not only for the Russian, but also for the world economy as a whole necessitate economic measures to reduce the harmful impact of farms on the environment and implement multifunctional planned use of land and water resources [6]. It is necessary to promote agricultural practices that reduce the adverse impact on the environment. Environmental accounting and audit are an effective tool designed to increase the transparency and quality of information on the activities of an agricultural enterprise in the field of rational nature management, environmental protection, and safety. Organization and guideline issues of internal eco-audit and their regional standardization are actively discussed in the scientific community [7-11]. However, no procedures, taking into account specific features of agricultural enterprises, for collecting, aggregating, or processing environmental information have been developed. In this regard, there is a need for developing agricultural and organizational foundations, procedures of the internal environmental audit system for farms aimed at ensuring their environmental safety.

1.2. Purpose and objectives of the research
The purpose was to develop unified norms and rules of the internal eco-audit of environmental premises and equipment in order to ensure environmental safety, minimize the risks and threats of emergencies caused by environmental problems of the enterprise.

The objectives of the research were to find out special features—sectoral, technological, and organizational ones—of agricultural enterprises; determine their impact on setting and implementing the internal eco-audit system; justify the need for the eco-audit of assets of agricultural enterprises; work out uniform rules and a comprehensive set of consistent procedures for the eco-audit of agricultural premises and equipment, which enables the auditor to identify possible risks of environmental non-compliances and accidents; and develop a structure and content of the internal regulations of eco-audit of agricultural facilities.

2. Methods
In the research, general scientific methods of information processing—comparison, analysis, grouping, synthesis, and tabular method —were applied.

3. Research results
The legal framework for the eco-audit system is the Federal Law No. 307-FZ “On Auditing” dated December 30, 2008 [12] that lays down the principles of audit regulation and defines the requirements for auditors. Moreover, the regulatory framework for an internal eco-audit is the Federal Law No. 7-FZ “On Environmental Protection” dated January 10, 2002 [13] that defines the term “ecological audit,” establishes the powers of state authorities in this area, and other provisions related to environmental issues and, consequently, to the internal eco-audit system. The purpose of the eco-audit is to assess the impact of an economic entity on the environment, forecast its environmental consequences, establish the compliance of its activities with the requirements of the current environmental legislation, regulations, standards, rules, and decrees of federal environmental authorities, and determine trends of environmental safety in production and its efficiency [14].
The specific business activities of agricultural enterprises determine the need for developing uniform standard procedures of the eco-audit in agriculture. Environmental premises and equipment take a considerable part in the composition of non-current assets of an agricultural enterprise. In this regard, customers are interested in reliable and high-quality information generated by the accounting system on the composition, structure, market value, and amortization expenses for environmental facilities [15]. The information based on the eco-audit of premises and equipment and their movements is accurate and reliable, contributes to the timely and effective managerial solutions on their purchase and restoration, and helps external engaged users to come to an accurate conclusion about the agricultural enterprise’s impact on the environment and the agro-business’ ecological culture, environmental literacy, and education.

Laws and regulations that restrict auditing and environmental protection establish general rules and practices for the eco-audit, without its clear procedures, forms, or criteria of working documents being established. This is explained by the fact that each industry is distinguished by specific activities; therefore, the eco-auditor’s optimal procedures and working documents can be determined only through a multi-level analysis of the industry condition that reflects its specifics and the environmental effects of the industry members. The internal audit of premises and equipment consists in working out an informed judgment regarding the completeness and reliability of information on the condition, receipt, and disposal of the enterprise’s assets. To carry out the verification, the auditor applies certain audit tools and data from the enterprise’s accounting and financial reporting and notes on them [16].

The internal assets audit program for an agricultural enterprise implies procedures presented in table 1.

| No. | Intended activities | Working documents |
|-----|---------------------|-------------------|
| 1.1 | CONTROL ASSESSMENT OF THE ASSETS’ AVAILABILITY AND MOVEMENTS AT THE ENTERPRISE | IL of tractors, combine harvesters, and other agricultural machines—No. INV-1; IL of working cattle, productive animals, poultry, and bee colonies—No. INV 20-AIC; and others. |
| 1.2 | Inquiring financially liable persons (hereinafter as FLP) to confirm and analyze the inventory list (hereinafter as IL). Review of inventory reports and decisions based on their results; inspection of premises, such as machine yards, garages, cowsheds, etc.; inquiring the FLP. | Inventory reports; orders of the executive head according to the inventory results. |
| 2.1 | WORKING CONTROL OF GENERATING THE EXACT INFORMATION ON THE ASSETS’ CONDITION AND MOVEMENTS | Data of primary receiving reports (form No. PE-1; f. No. PE-3; f. No. PE-4; f. No. PE-4a; f. No. PE-6; f. No. PE-9; f. No. PE-14; f. No. PE-15, etc.) to be compared with contracts for supply, sale, purchase, leasing, and PE lease; and supplier’s invoice. |
| 2.2 | Audit of the availability of premises and equipment (hereinafter as PE) and completeness of the balance sheet disclosed. PE regulation compliance monitoring. | Civil Code of the Russian Federation (parts one and two); Tax Code of the Russian Federation (part two); Federal Law No. 129-FZ dated November 21, 1996 on accounting; Order of the Ministry of Finance of the Russian Federation No. 67n dated July 22, 2003 on the forms of the accounting of organisations; RAS 6/01 “Accounting for fixed assets,” etc. |
| 2.3 | Audit of the PE validity in the accounting (to identify the PE of the agricultural enterprise). | Accounting registers for the PE maintenance operation; cumulative records of trucks used; a logbook for the downtime of the machine and tractor fleet; a livestock book; and truck and tractor waybills of lading. |

Table 1. Internal assets audit program for an agricultural enterprise.
2.4 Audit of the agricultural PE assessment.

Item “Premises and equipment” (form No. 1); “Balance sheet” report; trial balance, general ledger, statement of financial results (form No. 2); and “cash flow statement”.

2.5 Audit of the PE financial period delimitation.

Audit of the information disclosure in the financial statements, i.e.

1) audit for compliance of the primary accounting data with the data in the accounting registers; and
2) audit for the identity of the accounting data and indices in the financial statements.

Closing statements, order journal No. 13-APC, and inventory card of perennial plantings.

2.6 Audit of the information disclosure in the financial statements, i.e.

1) ledger No. 13-AIC, 11-AIC, account 01 “Premises and equipment”; trial balance or general ledger for account 01 “Premises and equipment”; and
2) item “Premises and equipment” (form No. 1); “Balance sheet” report; trial balance, general ledger, statement of financial results (form No. 2); and “cash flow statement”.

Source: compiled by the authors.

When assessing the accounting controls for the PE availability and movements, the auditor examines the organization of liability at the enterprise; the frequency of the PE inventory; protection and soundness of assets performed by financially liable persons; document flow schedule; the degree of accounting automation; and archive-keeping.

We proposed to formalize the assessment results of the PE control system in an internal auditor’s working document “Assessment of the internal monitoring system of the assets accounting” (table 2).

Table 2. The internal auditor’s working document “Assessment of the internal monitoring system of the assets accounting”.

| Question | Answer |
|----------|--------|
| Are all premises and equipment shown in the analytical account? | yes/no |
| Are all premises equipped with fire alarms? | yes/no |
| Was the current inventory commission appointed by order of the executive head? | yes/no |
| Is the timing of the PE inventory determined in the accounting policy? | yes/no |
| When was the latest PE inventory? Were its results considered in the accounting? | yes/no |
| Are there any orders for FLP appointments? | yes/no |
| Were any full financial liability agreements with the FLP concluded? | yes/no |
| Was the PE accounting time-schedule control developed and performed? | yes/no |
| Is there an order for creating a PE review board? Are the documents for this operation approved by the executive head? | yes/no |
| Was the procedure for depreciation settlement shown in the accounting policy of the enterprise? | yes/no |
| Was the procedure for accounting the PE repairing cost presented in the enterprise’s accounting policy? | yes/no |
| Are the assets revalued? | yes/no |
| Is the accounting of PE operations computerized? | yes/no |

Source: compiled by the authors.

Correct and exact assessment of the internal control system (hereinafter as ICS) contributes to the problem accounting areas being identified and a tentative judgment on the control reliability at the enterprise, including states and structures of environmental articles of fixed assets, being formed [17]. While having practical control over generating exact information on conditions and movements of assets, we suggested to apply an internal auditor’s working document developed (table 3). Filling out this working document allows identifying the discrepancy between the amounts and correspondence of accounts that are shown in the primary documentation for PE accounting and the accounting procedure in accordance with the applicable legislation.
Table 3. The internal auditor’s working document “Control of generating exact information on conditions and movements of assets”.

| PE operation details | Procedure for PE accounting in accordance with the legal requirements | PE operations in the accounting registers of the enterprise | Auditor’s conclusion of infringements (or their absence) in the PE accounting of the enterprise («+», «-») |
|----------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
|                      | DT      | KT    | Amount, RUB | DT      | KT    | Amount, RUB | |
| Historical cost accounting of PE received as a contribution to the equity | 01 08 | 10 000 | 01 08 | 10 000 | No infringements |

Source: compiled by the authors.

The completeness and accuracy of accounting records and reports are determined by the audit. In the event of a substantial impact of any aspect, including environmental one, on the production and economic activities of the agro-industrial enterprise, this aspect is subject to analysis and verification by an internal auditor [18].

Environmental pollution by an enterprise in the course of its economic activities usually implies the enterprise’s ownership of facilities used to minimize the adverse impact on the environment [19]. The need for auditing the accuracy of environmental PE accounting is explained by the fact that a sizable proportion of the enterprise’s activities in the field of environmental management is considerably influenced by indicators characterizing environmental fixed assets.

The order of the Federal State Statistics Service No. 473 “On the approval of statistical tools for the organization of federal statistical observation of agriculture and the environment” dated August 01, 2018 contains a list of environmental facilities [20].

In order to determine the essence of articles of environmental fixed assets, a need arises to disclose the list that includes types of environmental assets, i.e.

1) protection of atmospheric air: installations and equipment for the sulfur production; barrier filters for cleaning gas-air flows; filters for dust separators; and equipment for measuring the dust concentration;

2) wastewater treatment: advanced waste treatment facilities, including sewage farms; settling tanks, oil catchers, oil traps, sand traps, sand and other filters, centrifuges; and flocculation and flotation;

3) waste management: production and consumption waste calcination facility; ash collecting installations; and enterprises for accumulation, sorting, recycling, and disposal of solid and liquid toxic industrial, household, and other wastes (except for medium and high radioactive wastes); and

4) protection and remediation of lands and surface and ground waters: terracing and flattening of slopes, ravines, and gullies; construction of shafts, dams, estuaries, water guides, spillways, bottom structures, and detention dam; protective forest belts, including field-protective belt, etc.

The primary function of the main environmental facilities is to protect the environment, which involves reducing the concentration of harmful substances and contamination in the environment, increasing the quantity and quality of usable land, forest, and water resources, etc. [21].

The purpose of the audit of fixed assets designed for minimizing the adverse impact on the environment is to control the accuracy of facilities, being operated by the enterprise. The advantage of the internal eco-audit is a decrease in the ecological tariff for environmental pollution and penalties for violating norms, exceeding the pollution limits and projected costs for pollutants and waste disposal and utilization, as well as a decrease in environmental risks and a company reputation's rise in consumers’ estimation.
In order to standardize the internal audit procedures developed, we worked out the Regulation for eco-audit of environmental facilities of agricultural enterprises. The structure of the Regulation for the internal audit of environmental facilities is presented in table 4.

Table 4. The structure of the Regulation for the internal audit of environmental facilities of an agricultural enterprise.

| Section                                                                 | Content Description                                                                                                                                                                                                 |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. General concepts                                                   | Contains terms used in the Regulation, for example, “Production and consumption waste,” “Documentation,” “Audit report,” etc. and their definitions.                                                                 |
| 2. General provisions                                                  | Provides general information, regarding the organization and internal eco-audit/control, and the regulatory and legal framework for its implementation. For example, this system is based on the Federal Laws “On Auditing Activity,” “On Environmental Protection,” etc. |
| 3. Purpose and objectives of the internal eco-audit/control system    | Dwell on the purpose of the audit of environmental facilities that is to monitor the effectiveness of the environmental facilities used by the enterprise, as well as on the objectives to audit the movement of environmental facilities recorded in the accounting of the enterprise; and check the adequacy of information on the replacement of environmental facilities, violation of environmental emission standards, and discharges during the downtime of environmental facilities. |
| 4. Bodies and persons, liable for internal eco-audit/control          | Defines the structural unit and its functional duties, including the internal audit, its tasks, organizational structure, etc. For example, the internal audit/control service.                                                                 |
| 5. Procedures of the internal audit/control department                | Contains the rights, duties, procedures, and coordination between the internal audit department and other business units.                                                                                                                                                       |
| 6. Accountability of the internal audit/control department            | Regulates the subordination of the head of the internal audit department to the owners and director of the agricultural enterprise, the frequency of reporting, etc.                                                                 |
| 7. Basic audit/control procedures for environmental facilities        | Includes sequential interrelated audit procedures, i.e. understanding the environmental specifics of the enterprise's activities; assessment of the internal control system for environmental facilities; assessment of the organization's provision with environmental facilities; health assessment of the facilities – sources of pollution – and environmental facilities; analysis of the environmental protection measures implemented. |
| 8. Audit report formation procedure                                   |                                                                                                                                                                                                                      |
| 9. Final provisions                                                    |                                                                                                                                                                                                                      |
| 10. Applications                                                       |                                                                                                                                                                                                                      |

The Regulation for the internal audit of environmental facilities of an agricultural enterprise includes 10 sections. We considered their contents in more detail.

The section “General concepts” contains terms used in the Regulation, for example, “Production and consumption waste,” “Documentation,” “Audit report,” etc. and their definitions.

The section “General Provisions” provides for general information, regarding the organization and internal eco-audit/control, and the regulatory and legal framework for its implementation. For example, this system is based on the Federal Laws “On Auditing Activity,” “On Environmental Protection,” etc.

The section “Purpose and objectives of the internal eco-audit/control system” dwells on the purpose of the audit of environmental facilities that is to monitor the effectiveness of the environmental facilities used by the enterprise, as well as on the objectives to audit the movement of environmental facilities recorded in the accounting of the enterprise; and check the adequacy of information on the replacement of environmental facilities, violation of environmental emission standards, and discharges during the downtime of environmental facilities.

The section “Bodies and persons, liable for internal eco-audit/control” defines the structural unit and its functional duties, including the internal audit, its tasks, organizational structure, etc. For example, the internal audit/control service.

The section “Procedures of the internal audit/control department” contains the rights, duties, procedures, and coordination between the internal audit department and other business units.

The section “Accountability of the internal audit/control department” regulates the subordination of the head of the internal audit department to the owners and director of the agricultural enterprise, the frequency of reporting, etc.

The section “Basic audit/control procedures for environmental facilities” includes sequential interrelated audit procedures, i.e. understanding the environmental specifics of the enterprise's activities; assessment of the internal control system for environmental facilities; assessment of the organization's provision with environmental facilities; health assessment of the facilities – sources of pollution – and environmental facilities; analysis of the environmental protection measures implemented.

4. Conclusion

Thus, we can conclude that the most effective tool for ensuring environmental safety and preserving natural systems by an economic entity is the internal ecological audit system of environmental facilities of agricultural enterprises. When developing the internal eco-audit system, we took into account the specifics of agricultural enterprises, namely, the territory occupied and company profile; diversification of the agricultural production, its implementation in different geographic areas with different levels of
environmental exposure and ecological norms. The author’s methodology and sequential procedures of the internal eco-audit of environmental facilities allow agro-industrial enterprises to solve problems of ensuring their environmental safety, minimizing the environment-related risks and threats, and thereby reducing the volume of work of the Environmental Prosecutor’s Office of the region, the Federal Service for Supervision of Environmental Management, the Committee for Natural Resources, Forestry, and Ecology and other authorities in the field of environmental security.

Acknowledgments
The work was performed under the grant of the Russian Science Foundation No. 19-76-10010.

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