1. Introduction

Lack of investment in irrigation infrastructure for more than two decades has contributed to a significant deterioration of its condition, which has reached a critical level to now. Thefts in the linear and basic facilities, strong depreciation of the intake and distribution network, water losses in irrigation systems amounting to 70-80% are one of the reasons for the development of a "Common Strategy for Management and Development of Hydro melioration and Protection against Harmful Effects of Water". It identifies as an important priority the rehabilitation and modernization of irrigation and drainage infrastructure in our country and the necessary capital expenditures for this are more than one billion euro [1].

For this reason, it was urgent to draw up a proposal from the team of World Bank staff and consultants for a framework, programming and prioritization of funding from the European Agricultural Fund for Agricultural Rural Development and the Rural Development Program (RDP). The main aim of this project is to contribute to improving the competitiveness of agriculture, together with promoting effective water consumption and increasing the environmental sustainability of irrigated areas [2].

Based on this project, the most favorable impacts are expected to be achieved within RDP Area 5A Increasing agricultural water efficiency, namely: Measure M4 Investments in tangible assets, Sub-measure 4.3 aimed at supporting investments in irrigation and drainage infrastructures [3]. For the purpose of programming and defining priority irrigation systems, it is recommended to use a multi-criteria assessment to allow the ranking of a list of rehabilitation and modernization projects for irrigation systems.

Beneficiaries of the Sub-measure 4.3 will be Regional Public Hydro-melioration Enterprises (it is expected that the Irrigation Systems Company will be restructured into such), Irrigation Associations (According to the Irrigation Associations law) and Municipalities, which there are at least one Irrigation Association on their territory and apply for financial support with the associations.

Good practices analyzed related to the construction of irrigation infrastructure show that project management in this area is essential to the qualitative and effective achievement of the ultimate goal. The project management process groups include planning processes, implementation processes, monitoring and control processes and completion processes. Interaction between the management processes is shown in Fig. 1.

The purpose of this report is to analyse the group of planning processes at the construction stage of certain rehabilitation and reconstruction projects for irrigation infrastructure for the different areas of management (time, cost, quality, human resources, communications, supply and risk) [4].

2. Results and discussion

The planning process group at the irrigation infrastructure construction stage aims at establishing the overall scope of the activity, defining and refining the objectives and developing an action plan in each management area (Fig.2).
2.1 Planning in the time management area

The planning processes in the time management area for the irrigation infrastructure construction stage are mainly limited to:

- Definition and decomposition of the activities for the implementation of the construction stages of the site, including preparation of the construction site, main construction and finishing works
- Choosing the resources needed to implement the activities, including human resources, construction mechanization, materials
- Determination of the sequence of execution of individual works and elaboration of working calendar (linear or network model) with critical path analysis and certain time reserves for the respective types of works
- Assessment of the duration of the execution of the construction works and the optimization of the working schedule if necessary

Effective time planning will ensure consistency of costs and time for building the site; availability and coordination of resources used; possibility to predict contingencies; clarity for the execution of the site within the agreed deadline.

2.2 Planning in the expenditure management area

The planning processes in the expenditure management area are:

- Planning the financial means according to the budget envisaged for the implementation of the site during the design phase and the working calendar schedule
- The analysis and evaluation of the financial charts are the term of construction – an integrated and differential flowchart of cash funds.

The cost estimate is designed to be controlled over time, provide funding during site construction, resource allocation

Based on the preliminary planning of the funds for the individual decomposed activities for the construction stage of the site, the baseline framework of costs over time is established and approved.

2.3 Planning in the supply management area

Planning processes in the supply management area include:

- Preparation of a supply management plan – the plan provides a description of how the procurement processes will be managed – from supplier selection to the completion of the contractual relationship with them. Selected suppliers will need to equip irrigation systems with water meters, water level controllers, gates, management and control systems, pumps and the other.
- An outline of delivery work – the information contained in this process may include technical specifications of deliveries; quantity; requirements for: quality level; delivery and installation time; warranty terms; technical support during the operation of the site, etc.
- Delivery documents – these documents include a statement of the supply work, including and binding clauses of contracts with suppliers; technical capabilities of the selected suppliers, production capacity, etc.

The supply planning processes are closely related to the working calendar schedule. For this reason, the decisions made in the delivery of the supply management plan should be integrated with the schedule preparation processes.

2.4 Planning in the quality management area at the stage of construction of the irrigation infrastructure

Quality planning in the construction of the irrigation infrastructure is limited to ensuring the quality of the site construction works and the quality of the management process. For this purpose, it is necessary to have clear technical specifications for the implementation of the site, use of Bulgarian and European standards regarding building materials, experience of the construction company in building similar sites, use of skilled labor and modern construction machinery.

2.5 Planning in the human resources management area

The planning process in the human resources management area at the irrigation infrastructure construction stage involves the development of a human resources plan on the basis of which the posts, responsibilities and relationships between human resources are planned; their working hours, wages, needs, technical safety of work, etc.

2.6 Planning in the communications management area

The planning process in the area of communications involves the planning of communication channels and the process of exchange of information between participants in the construction process. The Communication Management Plan provides stakeholders’ requirements for the type and manner of dissemination of the information; the deadlines and frequency of transmission of the requested information; restrictions on communication usually imposed by regulatory or company policies, etc.; a schedule for project team meetings, etc., which would improve communications.

2.7 Planning in the risk management area

The planning processes in the area of risk management are:

- Identifying possible sources of risk
- Analysis and assessment of possible consequences when the risk occurs
- Analyzing and assessing the possibilities for mitigating the effects of the risk development of a risk control and management plan

The planning processes in each area build up the project management plan and its documentation. During the implementation period, additional planning may be required due to the accumulation of additional information or the clarification of certain features. Significant changes that occurred during the implementation of the site triggered the need to review some of the planning processes and to gradually detail the project management plan. The update resulting from the approved changes during the construction of the sites may significantly affect parts of the project management plan. Updating these documents provides greater precision in terms of calendar planning; the spending of the funds for the implementation of the site; preventing risks or minimizing their impact, etc.

3. Conclusion

In line with the state of the irrigation systems and facilities, the priorities and measures formulated in the current programming period 2014-2020 under the Rural Development Programme as well as those developed by the World Bank and endorsed by the Council of Ministers in August 2016, a “Common Strategy for Management and Development of Hydro-melioration and Protection against Harmful Effects of Water” give us reason to expect the preparation, implementation and management of investment hydro-melioration projects concerning construction, reconstruction and modernization of irrigation systems and facilities. The restore of irrigation
infrastructure will not only increase the competitiveness of farms but shall also ensure effective, rational and environmentally sound management of available water resources.

For this reason, the beneficiaries of the selected priority projects for the reconstruction and modernization of irrigation systems and facilities need to focus on effective planning of the building construction stage in all areas of management, namely: time, cost, quality, human resources, communications, supplies and risk. All this will lead not only to the qualitative and timely implementation of the projects but also to the efficient spending of the financial resources under the Operational Programme.

4. References


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