

# Developing an Integrated Monitoring and Evaluation Flow for Sustainable Investment Projects

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## ABSTRACT

*Under the circumstances of certain weaknesses in the monitoring and evaluation processes of sustainable investment projects, the paper aims to develop a general integrated flow, encompassing both a project monitoring system and also a project evaluation system for the investment projects involving economic objectives, as well as cross-cutting social and environmental targets. The whole approach is being presented as a flowchart, which highlights the intimate relationship between the monitoring and evaluation processes, and provides a formal framework for performing a logical monitoring and evaluation process, taking into account simultaneously the economic, social and environmental perspectives, within an investment project. Last, but not least, the article states both the estimated advantages and the disadvantages of such a managerial tool, opening new perspectives for developing further improved models and systems.*

**KEYWORDS:** *evaluation, flow, investment projects, monitoring, sustainability.*

**JEL CLASSIFICATION:** *H43, O22, Q01.*

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## INTRODUCTION

The majority of projects incorporate, beside economic interests, certain social and environmental features, which may prove powerful sources of competitive advantage.

However, assuming social and environmental objectives among the economic targets of an investment project is not enough, as it is necessary for those objectives to be monitored and evaluated during the entire life cycle of a project. If monitoring and evaluating the economic performance achieved within an investment project is not such a difficult challenge, monitoring the overall success of a project, taking into account also the social and environmental impact of that project, is a more difficult and challenging issue. In order to get a full view regarding a sustainable project, the project manager should focus on developing adequate monitoring and evaluating mechanisms.

In the present paper, the author defines a *sustainable investment project*, as being a project whose objectives encompasses both economic and social goals, as well as environmental targets.

Therefore, when developing a sustainable investment project, the monitoring and evaluation processes should present certain particularities, given the difficulty of quantifying both the social and the environmental impacts of a project.

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The concepts of monitoring and evaluation are usually approached together, as a function of project management, which provides a real perspective upon the stage of the financed project, in order to make all the adjustments necessary in the project implementation process.

Monitoring and evaluation are regarded as core tools for enhancing the quality of project management, taking into account that in short and medium run managing complex projects will involve corresponding strategies from the financial point of view, which are supposed to respect the criteria of effectiveness, sustainability and durability (Dobrea et al., 2010). Monitoring activity supports both project managers and staff in the process of understanding whether the projects are progressing on schedule or meet their objectives, inputs, activities and deadlines (Solomon & Young, 2007).

Therefore, monitoring provides the background for reducing schedule and cost overruns (Crawford & Bryce, 2003), while ensuring that required quality standards are achieved in project implementation. At the same time, evaluation can be perceived as an instrument for helping planners and project developers to assess to what extent the projects have achieved the objectives set forth in the project documents (Field & Keller, 1997).

Even if the monitoring and evaluation processes are complementary and are part of the same project management function, they are regarded separately (Pollack, 2007). Monitoring is based on a current management practice with a focus on improving day-to-day project operation, while evaluation uses a research framework to evaluate the extent to which project objectives have been met or surpassed (Sheperd, 1994).

The differences between monitoring and evaluation, approached as basic complementary components of project management, are shown in *Table 1*.

**Table 1. Comparative analysis between monitoring and evaluation processes within project management**

	<b>ASSESSMENT CRITERIA</b>	<b>MONITORING PROCESS</b>	<b>EVALUATION PROCESS</b>
1.	Essence of the process	<i>“What happened during the project?”</i>	<i>“Why did it happen or not happen during the project?”</i>
2.	Attitude towards the project statements	Accepts the project design as given.	Challenges design of the project
3.	Focus	Focuses on efficiency, execution, compliance with procedures and achievement of inputs, outputs and purpose.	Focuses on causality, unplanned change, policy correctness and causal relations among outputs, purpose and goals.
4.	Feedback	Provides a continuous, based on activities and intern achievements feedback, on short run.	Uses a milestone approach, based on results, achieved over a long term frame.
5.	Results adjustments	Involves adjustments in implementation plan.	Involves adjustments in project strategy.

*Source: Author*

Thus, developing a successful project usually involves the development of monitoring and evaluation systems and workflows. (Yaghootkar & Gil, 2011). By including monitoring and evaluation from the pre-project stage, both the project manager and the project team will be providing themselves with thorough and ongoing feedback systems (Stead & Stead, 2003) that will allow them to make timely management decisions without waiting for the results of an evaluation.

## 1. LITERATURE REVIEW

Sustainable investment projects play an important role in the development process of economies. As a result, they have been described as the building blocks of development. Although a general accepted definition of a sustainable investment project has not been defined, certain features can be said to characterize any project.

According to Fortune & White (2006), a sustainable investment project may be described as a discrete investment activity, with a specific starting point and a specific ending point, intended to accomplish specific economic, social and environmental objectives simultaneously. It comprises a well-defined sequence of investments, which are expected to result in a stream of specific benefits over time.

World Bank Group (1996) defines a project as a capital investment for developing facilities in order to provide goods and services, while United States Environmental Protection Agency (2002) states that a project involves the utilization in the near future of scarce or at least limited resources in the hope of obtaining in return some benefits over a long period of time.

Even if we adopt a classical or a modern point of view, a project life cycle involves, as a rule, a **monitoring and evaluation work breakdown structure**, which provides real time information about the progress of the project.

Monitoring is being regarded by one of the most important project financing bodies, World Bank, as *the continuous assessment of project implementation in relation to agreed schedules and use of inputs, infrastructure, and services by project beneficiaries* unlike **evaluation**, which is regarded as the *periodic assessment of relevance, performance, efficiency, and impact assessment (expected and unexpected) of the project in relation to stated objectives*.

There are three main types of monitoring which are susceptible to be associated with the life cycle of a project or program (Sadler & Davies, 1998), and especially with the monitoring of the social and environmental non-quantifiable objectives.

The first category of monitoring refers to **baseline monitoring**, which is regarded as the measurement of economic, social and environmental variables during a representative pre-project period to determine existing conditions, ranges of variation, and process of change (Reeve, 2002).

The second category of monitoring is regarded as **impact monitoring**, encompassing the quantification of social and environmental variables during project development and operation, to determine changes that may have been caused by the project (Sadler & Davies, 1998), while the last category of monitoring, is regarded as **compliance monitoring** and takes the form of periodic sampling and/or continuous measurement of levels different economic or social parameters (Wiersma, 2004).

Similarly, evaluation involves the application of rigorous methods to assess the extent to which a sustainable investment project has achieved its defined impact objectives

(Pollack, 2007). Evaluation is being regarded as a set of activities aimed to determine as systematically and objectively as possible, the relevance, effectiveness, efficiency and impact (both intentional and unintentional) of a project in the context of its stated objectives. Just as monitoring, the evaluation process can be divided into three types of evaluation: **ex-ante evaluation**; **mid-term evaluation** and **ex-post evaluation**. Each of these types shows that evaluation is a continuous process, as well as monitoring.

According to the classical approach, monitoring and evaluation are clearly defined as distinct activities (Stackenbruck, 1981), while the modern approach deals with the two activities as inseparable components of the same system. In *Table 2* are shown the main differences between the classical and the modern approach of monitoring and evaluation processes within a project.

**Table 2. Comparative analysis between classical and modern view regarding monitoring and evaluation processes**

TRADITIONAL (CLASSICAL) VIEW	MODERN VIEW
Monitoring and evaluation are clearly defined and are regarded as distinct activities.	Monitoring and evaluation are intimately related activities.
Monitoring can be defined as a collection of regular information on inputs and outputs.	Monitoring includes the collection of information on purpose level achievements as well as information on inputs and outputs.
Evaluation takes place once or twice during a project life cycle.	Evaluation should be an integral part of effective project management and should be supplemented by special studies and periodic impact analysis, as needed.
Monitoring and evaluation are used for assessing a project's efficiency	Monitoring and evaluation are used as continuous improvement tools, which are susceptible to provide effective feedback for project management teams, in order to develop a pro-active procedure for implementing further investment projects.
Monitoring and evaluation are regarded as auxiliary activities within a project	Monitoring and evaluation are being regarded as project management functions, which are just as important as project planning or project implementation.
Monitoring and evaluation are focused mostly on project's objectives and budget	Monitoring and evaluation are focused on all components of a project: objectives, activities, deadlines, budget, results, project management team, risks etc.

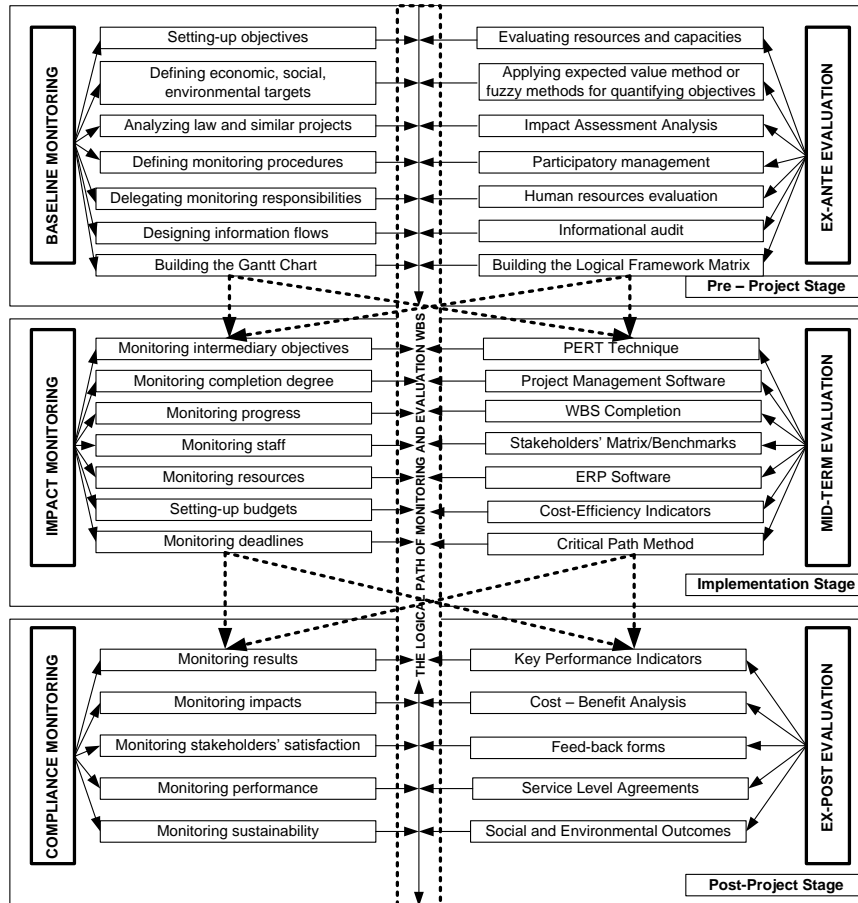
Source: Author

Therefore, monitoring and evaluation are part of the same process, which is being conducted through all the stages in the project life cycle and covers all the knowledge areas identified in the *Project Management Body of Knowledge* (PMBOK) produced by the *Project Management Institute*.

**2. RE-DESIGNING THE MONITORING AND EVALUATION FLOW**

The paradigm shift from the classical view of monitoring and evaluation activities, towards the modern view, which approaches the two activities as part of the same process, usually proves to be a difficult challenge, as there are no scientific tools to describe a manner of integrating the two activities in a coherent framework.

Moreover, in the last years, modern project management approaches are characterized by another paradigm shift, from a logical framework approach (LFA), focused on monitoring the implementation processes, to a **result framework approach**, which is mostly focused on tracking results, and which involves, in the same extent, monitoring and evaluation techniques. Under these circumstances, we present, in *Figure 1*, a flowchart which illustrates a project – parallel work breakdown structure, encompassing only monitoring and evaluation activities, integrated in a holistic and logical framework.



**Figure 1. The complete cycle of monitoring and evaluation flow**

Source: Author

The flowchart refers to the extent in which the decision makers can monitor and evaluate sustainable investment projects, being a complete tool for assessing also the social and environmental objectives of a project.

The flowchart emphasizes the connexions between the three types of monitoring (*baseline monitoring*, *impact monitoring* and *compliance monitoring*) and the three types of evaluation (*ex-ante evaluation*, *mid-term evaluation* and *ex-post evaluation*), describing a full map of the monitoring and evaluation process during the entire life cycle of a project.

The monitoring and evaluation processes are approached as a whole, for each stage of the project being presented specific methods, techniques and processes for performing the monitoring and evaluation processes. For each stage of the project life cycle, the monitoring and evaluation processes present specific characteristics, being performed with different intensity.

The processes involved by each stage of the project must also be approached as a whole, starting from Pre-Project Stage, where baseline monitoring along with ex-ante evaluation should be able to match as many criteria as possible from issues mentioned below:

- the monitoring and evaluation flow should start from setting-up project's objectives by evaluating the constraints enforced by the resources and capacities which are/might be available for the project; according to these constraints, the project management team might define the economic, the social and the environmental targets of the project, as core component of a sustainable investment project;
- the monitoring and evaluation flow involves setting-up specific targets in accordance with the objectives, by applying scientific methods such as expected value method or fuzzy method, in order to get a fully featured view on the benefits the project might provide;
- the monitoring and evaluation flow should be able to provide baseline data describing the possible problems that might occur during project implementation; for example these data might be collected by *analyzing law and similar projects processes*; as stated in *Table 2*, monitoring and evaluation are used as continuous improvement tools, which are susceptible to provide effective feedback for project management teams, in order to develop a pro-active procedure for implementing further similar investment projects;
- the monitoring and evaluation flow focuses on human resources as key factors for implementing, monitoring and evaluating a sustainable investment project; as a consequence, the flow states the assumption that the process of *defining monitoring procedures*, as well as the process of *delegating monitoring responsibilities* (which are corresponding to a participatory management approach completed with a human resources evaluation) lead to a consensus among the main stakeholders of a project on the specific indicators to be used for monitoring and evaluation purposes;
- the monitoring and evaluation flow involves, before entering the Project Implementation Stage, an informational audit, in order to effectively redesign the information flows taking into account the types and sources of data needed and the methods of data collection and analysis required based on the indicators; afterwards, the Pre-Project Stage ends up with the Gantt Chart and the Logical Framework Matrix, which are still the most useful instruments for performing an impact monitoring and a mid-term evaluation (which are the two stages of monitoring and evaluation processes, corresponding to the Project Implementation Stage).

The Pre-Project Stage and the initial stage of a project highlight the necessity to set a baseline value for each of the indicators which are going to be taken into account during the project.

Unless a baseline value is being established, the indicator levels collected during the implementation period cannot be compared to a meaningful referential; therefore, it is not possible to decide whether the economic, social and environmental impacts have improved or unimproved.

As stated before, in *Table 2*, the modern view regarding monitoring and evaluation processes states that monitoring and evaluation are focused on all components of a project: objectives, activities, deadlines, budget, results, project management team, risks etc.

The impact monitoring focuses on most of these components (*intermediary objectives, completion degree, project progress, staff, resources, budget and deadlines*), excepting the ones that either could not be monitored until the completion of the project or their monitoring is not relevant during the project implementation. Such issues include: results, impacts, stakeholders' satisfaction, or sustainability.

The mid-term evaluation performed upon the impact monitoring processes encompasses a variety of methods and techniques for assessing the efficiency of a sustainable investment project, such as PERT, Project Management Software (Microsoft Project, Primavera), WBS completion, Stakeholder's Matrix, Benchmarking, ERP Software, CPM, etc.)

The Post-Project Stage involves a compliance monitoring process, which focuses on monitoring results, impacts, stakeholder's satisfaction, performance and sustainability. These elements are taken into account when collecting feedback regarding a project, when defining Service Level Agreements for further similar projects or even when deciding if an investment project might be regarded as sustainable or not, by analyzing the social and environmental outcomes generated by the project.

The main differences between the impact monitoring (mid-term evaluation) and compliance monitoring (ex-post evaluation) are presented in *Table 3*.

**Table 3. Comparative analysis between impact monitoring and compliance monitoring**

<b>IMPACT MONITORING (MID-TERM EVALUATION)</b>	<b>COMPLIANCE MONITORING (EX-POST EVALUATION)</b>
Impact monitoring and mid-term evaluation should be used rather during project implementation stage	Compliance monitoring and ex-post evaluation should be used rather during post-project stage
Using impact monitoring in pre-project stage is useless, while using it during post-project stage is irrelevant	Using compliance monitoring in pre-project stage is impossible, while using it during implementation stage is irrelevant
Impact monitoring is used for corrections on the project during its implementation	Compliance monitoring is used for corrections on other similar projects, which are susceptible to be developed by the project management team
Impact monitoring provides a forecast for the expected results of the project, in each phase of its implementation	Compliance monitoring provides a background and additional data for baseline monitoring in other similar sustainable investment projects
Impact monitoring is synchronous and permanent	Compliance monitoring is asynchronous and periodical

Impact monitoring is mostly based on quantitative techniques and methods	Compliance monitoring combines the quantitative techniques and methods with qualitative techniques
Impact monitoring means traceability of the implementation process	Compliance monitoring means finding out the added value (economic, social or environmental) generated by a sustainable investment project

Source: Author

The entire monitoring and evaluation flow should be based on a set of assumptions, which should be strictly respected in each of the three stages of the monitoring and evaluation process. These assumptions refer to the necessity of:

- reaching an agreement on how the information generated will be used;
- defining the format, the frequency and the repartition of the reports;
- reaching a consensus regarding the monitoring and evaluation schedule;
- reaching an agreement when assigning responsibilities for monitoring and evaluation;
- providing an adequate budget for monitoring and evaluation.

By combining the monitoring and evaluation activities and following the succession of the combined results for both processes, the decision maker obtains the **logical path of the monitoring and evaluation work breakdown structure**.

This logical path ensures a coherent and complete monitoring process, being able to provide, in real time, a full description upon the project completion stage.

As well, the flowchart reveals a larger **diversity** of monitoring and evaluation tools and activities during the pre-project stage and a larger **volume** of monitoring and evaluation tools and activities during the implementation phase. However, the diversity of the monitoring and evaluation tools in this stage is lower, as most of the actions involve a routine approach.

With regard to the post-project stage, both the diversity and the volume of the monitoring and evaluation processes are lower, but the **importance of the achieved results** is more important.

Taking into account the three pillar structure of the sustainable investment projects (economic, social and environmental), the flow includes techniques for assessing impacts, but does not provide a full methodology for quantifying the qualitative social and environmental objectives.

### 3. ADVANTAGES AND DISADVANTAGES OF RE-DESIGNING THE MONITORING AND EVALUATION FLOW

Approaching the monitoring and evaluation processes as a whole, as shown in *Figure 1*, within a coherent, formal framework, will attain certain benefits in terms of efficiency and effectiveness regarding a project implementation. However, the approach has some major limits, which are susceptible to counterbalance those benefits.

These limits could be eliminated by practicing project management, as a result of previous experiences within project management teams. The main difficulties in



obtaining better results when using the monitoring and evaluation flow refer to:

- the lack of experience in applying most of the project management tools mentioned in *Figure 1*;
- the insufficient budget for monitoring and evaluation activities;
- the mentality of most project managers regarding the fact that monitoring and evaluation are bureaucratic activities, which claim lot of time and are useless, being performed as such;
- the inappropriate mix of methods and techniques, which are being used by project managers, without taking into account the three stages of monitoring and evaluation related to the project life cycle; as stated in *Table 3*, using impact monitoring in pre-project stage is useless, while using it during post-project stage is irrelevant and using compliance monitoring in pre-project stage is impossible, while using it during implementation stage is irrelevant;
- the lack of clearness in stating measurable objectives for the project and its components, which leads to the impossibility of defining performance indicators;
- the lack of a structured set of indicators, covering the economic, social and environmental outputs generated by the project and their impact on beneficiaries;
- the lack of a coherent methodology for collecting data and managing project record, so that the data processed are compatible with previous statistics and are available at reasonable costs;
- the lack of concern of the project managers to use in their baseline monitoring processes information gathered from other similar project's compliance monitoring processes.

**Among the multiple advantages of applying a re-designed monitoring and evaluation flow**, as shown in *Figure 1*, we could mention that it:

- ⇒ *emphasizes the delays and unconformities in the project design and execution plan, making possible a rapid reactive attitude to the unconformities which could not be foreseen;*
- ⇒ *reveals certain methods and techniques for assessing unquantifiable social and environmental objectives, especially during the ex-post evaluation stage;*
- ⇒ *provides information about whether the project is being carried out according to the Gantt chart, by monitoring the deadlines, the resources and the staff;*
- ⇒ *provides a permanent feed-back regarding the risks, which could be used for further similar projects, in order to define a more precise ex-ante evaluation, as well as a more strict baseline monitoring;*
- ⇒ *provides information about the resources' consumption and the likelihood of output achievement, during the impact monitoring processes;*
- ⇒ *provides background data for performing forecasts regarding the extent in which the project goals will be achieved or not;*
- ⇒ *identifies recurrent problems that need attention and recommends schedule changes, if necessary;*
- ⇒ *assesses the quality, quantity and deadlines of the project input;*
- ⇒ *identifies operational constraints within the projects, improving the success probability of the implementation;*
- ⇒ *enhances risk management mechanisms and provides information regarding the necessity of activating contingency plans;*
- ⇒ *reveals the compliance with certain standards and/or environmental/social values;*

- ⇒ supports the financing bodies' interests, by meeting donor accountability requirements;
- ⇒ identifies potential problems at an early stage and propose possible solutions for them, ensuring the development of a pro-active attitude during project management lifecycle;
- ⇒ provides guidelines for further similar sustainable investment projects, emphasizing the issues which generated problems during project implementation;
- ⇒ reveals the strengths and weaknesses of a project during ex-post evaluation and compliance monitoring processes;
- ⇒ provides a complete understanding of the stakeholder's view regarding the project;
- ⇒ allows action to be taken regarding budgeting and cost, as a result of unconformities;
- ⇒ ensures a systematic selection of indicators for monitoring project performance;
- ⇒ enables project managers to ensure the traceability of project completion and adjust the project components in order to ensure the compliance with the performance criteria.

The monitoring and evaluation flow obviously serves the interests of the financing bodies, of the project management team and of all the project beneficiaries, including the civil society. However, some fears may cause resistance to project monitoring and evaluation, and therefore, to applying the flow described above. **The main fears are generated by:**

- ✦ the lack of experience in working with clear defined responsibilities and formal procedures;
- ✦ the difficulty of quantifying some of the project impacts, only by using the flow described above;
- ✦ the change resistance for many project teams, which are not accustomed to use integrated monitoring and evaluation tools and mechanisms;
- ✦ the mentality of certain project managers, who rather apply a *laissez-faire* management style or a "learning by doing" management style than a rigorous formalized approach within project management.

Under these circumstances, is difficult to assume that on short run such a monitoring and evaluation instrument could become a common project management tool, such as Logical Framework Matrix, for example, which has also its contesters.

## CONCLUSIONS

Assuming that, on one hand, monitoring provides the background for reducing schedule and cost overruns, while ensuring that required quality standards are achieved in project implementation and, on the other hand, the evaluation can be perceived as an instrument for helping planners and project developers to assess to what extent the projects have achieved the objectives set forth in the project documents, we could identify a close connexions between these two processes, which should be approached as functions of project management.

Moreover, monitoring and evaluation functions of a project are encompassing many processes, which present clear interdependencies which require them to be performed in essentially the same order.

The paper states this close relationship between the monitoring and evaluation processes within project management, as well as the intimate connexion between these processes and the project life cycle.

The relationships can be summarized by using a flowchart, in order to present the monitoring and evaluation processes as a single function of project management, which follows a parallel work breakdown structure, strongly related to each phase of the project work breakdown structure.

The necessity of applying a formalized monitoring and evaluation flow is being supported by many international studies, which revealed that most projects are facing serious problems before completion and part of them are being abandoned after important amounts of money had already been invested.

Thus, in up to 19 of 20 cases, there were reported communication problems between the project's stakeholders, the completion terms were overlapped, the objectives were not completely reached and the project management teams frequently called for more money, in order to complete the project activities. Applying the monitoring and evaluation flow as described before is susceptible to suggest solution for most of these problems.

By applying a coherent monitoring and evaluation flow, the project developers will be able to increase the effectiveness of their projects, in term of goals' achievement, resources and deadlines compliance and will be able to assess the economic, social and environmental impacts of their sustainable investment projects.

Each feature included in the monitoring and evaluation flowchart needs further development and specific procedures and methodologies, aimed to describe the circumstances under which it should be used and the expected impacts of its currently use.

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## **REFERENCES**

- Crawford, P. & Bryce, P. (2003). Project Monitoring and Evaluation: A Method for Enhancing the Efficiency and Effectiveness of Aid Project Implementation, *International Journal of Project Management*, 21(5), 363-373
- Dobrea, R. C., Ciocoiu, N. & Tipa, S. (2010). Investments Characteristics in Infrastructure Industry, *Economia. Seria Management*, 13(1), 204-210
- Field, M. & Keller, L. (1997). *Project Management*, Andover, Thomson Learning, Emea
- Fortune, J. & White, D. (2006). Framing of Project Critical Success Factors by a Systems Model, *International Journal of Project Management*, 24(8), 53-65

- Pollack, J. (2007). The Changing Paradigms of Project Management, *International Journal of Project Management*, 25(3), 266-274
- Reeve, R.N. (2002). *Introduction to Environmental Analysis*, John Wiley and Sons Ltd Publishing House, San Francisco
- Sadler, B. & Davies, M. (1998). *Environmental Monitoring and Audit: Guidelines for Post-Project Analysis of Development Impacts and Assessment Methodology*, Centre for Environmental Management and Planning, Aberdeen University, Aberdeen
- Sheperd, A. (1994). *Post Project Impact Assessment and Monitoring: Environmental Methods Review: Retooling Impact Assessment for the New Century*, The Press Club, North Dakota
- Solomon, P. & Young, R. (2007). *Performance Based-Earned Value*, John Wiley and Sons Ltd Publishing House, San Francisco
- Stackenbruck, L.C. (1981). *The Implementation of Project Management*, Project Management Institute, PA, John Wiley and Sons Ltd Publishing House, San Francisco
- Stead, W.E. & Stead, J.G. (2003). *Sustainable Strategic Management: Strategic Management*, ME Sharp INC, New York
- United States Environmental Protection Agency, (2002). *Guide for Measuring Compliance Assistance Outcomes*, Washington D.C.
- Wiersma, G. B. (2004). *Environmental Monitoring*, University of Maine, CRC Press Publishing House, Orono, Maine
- World Bank Group, (1996). *Design Project Monitoring and Evaluation*, Retrieved from: <http://www.adpc.net/pdr-sea/eval/file39.htm> on 20.03.2011
- Yaghootkar, K. & Gil, N. (2011). The Effects of Schedule-Driven Project Management in Multi-Project Environments, *International Journal of Project Management*, In Press, Corrected Proof