

PERFORMANCE MEASUREMENT FOR INFRASTRUCTURE PROJECT SUSTAINABILITY

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ABSTRACT

From a lean construction perspective, the role of a Public Roads Administration is to identify the value from the client's point of view and define the processes able to develop the value stream. In the long-run strategy, the public role is to be sustainable and apply the sustainability principle in the management of the portfolio of projects under the administration's control. This implies the development of a performance measurement system for sustainability. The case of the Norwegian Public Roads Administration is presented and analysed in the paper, as an example of an actor working on performance measurement for sustainability. The purpose is to evaluate the state of the art and use document study and literature to propose improvements. The research questions addressed in the paper are how sustainability is measured today for the construction portfolio in the Norwegian Public Road Administration and what are the pros and cons of the actual method (for measuring sustainability today). The proposal for improvements is made by comparing the state of the art with performance measurement theory.

KEYWORDS

Lean construction, sustainability, action research, performance measurement, and infrastructure projects.

INTRODUCTION

Among the roles of the project owner, understanding the value connected with a project is the first step to defining a committed process for managing the project with a clear vision (Fisher et al., 2017). From a public ownership perspective, the value must be identified from a societal point of view, as society is the direct client of the infrastructure work, in a lean construction perspective (Kalsaas 2017). Looking at the long-term perspective, sustainability is identified as a strategic goal for society (Samset, 2010) and it is towards this goal that the project and

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portfolio management must be evaluated. Evaluating sustainability has different implications, depending on the level of application of the requirement: a sustainable company must have a sustainable portfolio of projects, but a company with a sustainable portfolio is not necessarily a sustainable company. The focus of the paper is measuring sustainability at the project and portfolio levels. This is because having a single sustainable project could bring a not-sustainable portfolio: the investment, necessary to reach the goal at the single project level, could, for example, bring a lack of finance for other projects, already evaluated as necessary, with a consequent negative effect on society as a result for the whole portfolio. Before developing a performance measurement system for portfolio sustainability, it is necessary to understand how sustainability is measured for a single project.

The research questions addressed in the paper are

- how is sustainability measured today for the construction portfolio in the Norwegian Public Road Administration?
- what are the pros and cons of the actual method (for measuring sustainability today)?

The paper focuses on the case of the Norwegian Public Roads Administration (NPRA), as an example of a project owner with a large portfolio of projects dealing with the sustainability goal. The sustainability evaluation system used to define the construction portfolio for NPRA is compared with the chosen literature in terms of the choice of sustainability criteria. Pros and cons of the actual method are described and evaluated and a proposal for improvement is done using performance measurement theory, with a focus on sustainability performance measurement for the project portfolio.

LITERATURE REVIEW

The literature used for the article has three main branches. The first is dealing with the available literature on sustainability for infrastructure projects. In particular, the authors were investigating what the existing literature means with sustainability for infrastructure projects. The concept of sustainability is intended as a strategic measurement (Samset, 2010) for the long-term effect (Samset et al, 2022). But sustainability is also intended as the group of goals defined by the United Nations in the adoption of the Sustainable Development Goals (2015) built on the principles stated in the resolution "The Future We Want" (A/RES/66/288, 2012). These goals focus on the three pillars of economy, environment and society.

There are numerous scientific papers and publications on the sustainability topic (among 1'500'000 just in Google Scholar, searching for sustainability and infrastructures; over 2'300'000 searching for sustainability and roads), but few of them are focused on sustainability as set of criteria defined for a long-term goal. The sustainability criteria presented in the literature include economic criteria, environmental criteria, social criteria and a set of governance criteria, as for example time, innovation and seriousness of actors (Akomea-Frimpong 2022). Among the selected articles, some adopt the definition of the three pillars of sustainability (Faiz et al., 2012; Scope et al., 2021), while others investigate the sustainability topic in the infrastructure sector in a more holistic perspective (Corriere et al, 2012; Montgomery et al., 2015). Part of the investigated literature, nevertheless, especially if related to material development, limits the concept of sustainability to the environmental or climate topic (Hu et al., 2019). Like other actors operating in the infrastructure field, NPRA has adopted the broader definition, recognizing sustainability as a long-term value and building the strategy for the agency on 5 main goals that deal with the three sustainable pillars.

The second branch of the investigated literature deals with performance measurement and in particular with guidelines for performance measurement (Andersen et al., 2021). The available literature on performance measurement with a focus on sustainability is often an inherent production field (Qorri et al., 2018) and is almost always focused on the measurement

of performance at the company level, even when related to public agencies (Adams et al., 2014). Interesting considerations can be made from the study of literature on performance measurement focused on sustainability applied in different fields from infrastructures (Warhurst, A., 2002), especially on the definition of the indicators and on the importance of stakeholders in the strategic focus of the company (Silva, 2019). The application of performance measurement guidelines to the sustainability measurement of the projects and portfolio of projects for a company is a necessary step towards the measurement of the sustainability of that company: to be a company focused on sustainability, the management of the portfolios and projects needs to be focused on sustainability (while the reverse is not automatic, as a company deals with additional activities outside the portfolios of projects). Developing a performance measurement for sustainability for the projects and the projects portfolios of a company is therefore a necessary step for a sustainable organization and the analysis of NPRA's methodology for performance measurement of projects and portfolio's sustainability will be the focus of the present paper.

Chosen literature on performance measurement theory (Andersen et al., 2021) and application (Andersen et al., 2021; Koho, 2015) has been used to analyse the existing performance measurement method in NPRA and to suggest improvements.

Finally, the third branch of literature is related to sustainability and Lean. The connection between lean theory and sustainability performance is not new in the literature (Garza-Reyes, 2015; Martínez León, 2017), also in the engineering and construction field (Khodeir and Othman, 2018), but especially in the production field (Carvalho et al., 2011; Kofi et al., 2023; Mollenkopf et al., 2010). Since lean theory and the green concept have similar goals, the application of lean principles generally improves sustainability performance (Bhattacharya et al., 2019; Duarte and Cruz-Machado, 2015). The vice-versa effect is also supported in literature, since the explicit consideration of environmental sustainability, as the capacity to sustain the positive environmental effect gained in the long term (Samset, 2010), is seen as so effective from the lean perspective that sustainability is proposed by some literature (Flidner, 2008) as an additional lean principle. Several aspects of sustainability are considered in lean literature, from the environmental to the social one (Duarte and Cruz-Machado, 2015). Nevertheless, there is no agreement in the literature on how sustainability is measured.

METHODOLOGY AND RESEARCH LIMITATIONS

The paper has two areas of the research design: the first is the case study analysis, with documents and programs study; the second is the document study of chosen literature.

The case study chosen is the Norwegian public roads administration, as a relevant example of actors dealing with sustainability in several phases of infrastructure projects. NPRA has published 5-top-goals for the strategy of the agency, together with the sustainability strategic areas (Figure 1). The status of portfolio management focusing on sustainability has been investigated (Minoretti et al., 2023) and specific documents and program studies have been performed. The documents analyzed have been suggested in information-gathering meetings with key informants from NPRA. Among the analyzed tools, the program used for suggesting the prioritization of the projects in the construction portfolio, called Effekt, has been studied. The program is used in the early-stage design and is evaluating each project's performance among societal, economic and environmental goals.

The system used today to measure sustainability in NPRA, for the specific application of the Effect program, is compared with chosen literature (Haavaldsen et al., 2012) and the pros and cons are investigated, in terms of indicators and in terms of process, using relevant literature on performance measurement (Andersen et al., 2001).

For the choice of the literature used in the study, a scoping literature review has been done on the topic of sustainability and infrastructures and on the topic of performance measurement

systems. Google Scholar, Scopus and Research Rabbit are the chosen database. Using the keywords “sustainability”, “indicators”, “portfolio”, “selection”, “roads” and “projects”, no results are found in Scopus research database. The same combination allows us to find 20’900 results in Google Scholar. A systematic screening of the documents shows the scarce relevance of the literature for the research topic. Therefore, a partial combination of keywords is used and selected articles are inserted in Research Rabbit to increase the number of documents that could be interesting for the study. Finally, chosen relevant literature on the sustainability topic and on the performance measurement theory is selected from the search findings and used for the discussion.

The findings from the case study on NPRA, applying the results from the literature search, can be used to propose improvements in the performance measurement system for sustainability, both in terms of indicators and in terms of the process for evaluation. The study is used to understand the challenges in sustainability performance measurement for projects and portfolios of infrastructures, with a particular focus on the sustainability indicators used and on the process of measuring sustainability.

RESULTS

The present chapter describes how sustainability is measured today in NPRA and in the chosen literature, in terms of selected criteria and in terms of performance measurement, at the project and portfolio level. The strategic criteria for the organization are presented and a detailed description is done on the measurement and indicators used for the early phase of the investment (construction) portfolio. In particular, the tool ‘Effekt’ is taken into the analysis, since it is the only tool used by the agency to take care of the economy, environment and society in the sustainability measurement. The tool is used only in the early phase of the projects. The indicators are compared with the chosen literature and the general performance measurement system is described.

THE CHOSEN INDICATORS FOR SUSTAINABILITY

For each one of the three sustainability pillars, the specific department dealing with the concept phase for the project has defined a list of indicators that are used in a specific program called ‘EFFEKT’. The program, previously used for the analysis of the societal and economic impact, has been recently implemented to take care also of the environmental criteria.

As for the societal and economic indicators, for which the program allows to perform specific calculations and derive a defined measurable value, the climate impact has been implemented as one of the measurable indicators for the environmental impact analysis. On the contrary, other environmental indicators, for example, related to the evaluation of the impact on landscape, outdoor life, natural diversity and resources and cultural heritage, are considered separately in the evaluation and listed as non-numerical parameters. For them, an evaluation based on a level choice for the impact has been the chosen output and nine levels of consequence have been defined, from very negative to very positive.

For the priced themes (measured in money), the principles used in the evaluation are:

- utility about the benefits of a measure
- cost (or negative benefit) of disadvantages of a measure
- net benefit/net present value about the difference between benefit and costs
- socio-economic profitability (or positive net benefit/net present value) of measures where the benefits are calculated to be greater than the costs.

For the non-priced consequences (evaluated in a qualitative method), the principles used in the evaluation are positive consequences of the benefits of a measure or negative consequences of the disadvantages of a measure.

While the non-measurable indicators are listed, with the related evaluation, in a separate file, all the measurable indicators are returned in a monetary equivalent global evaluation. The evaluation is done for every proposed project and the program is used to compare the projects and to compile a list of suggested projects for prioritization. The indicators chosen in the Effekt program are listed in the following table (Table 1) and tentatively divided into the three sustainability pillars, showing the holistic perspective of the early-phase analysis that NPRA is performing.

In literature, considering the publications with a uniform concept of sustainability as based on the three pillars concept, it is possible to find a similar indicator list. The list stated in chosen literature is therefore selected (Haavaldsen et al., 2012), as specifically defined for investment projects and divided into the three sustainability pillars (Table 1). The indicators are listed in the table grouping them considering the similarity with the correspondent indicators defined by NPRA.

SUSTAINABILITY PERFORMANCE MEASUREMENT IN NPRA

NPRA is one of the actors dealing with different phases of a project, from the concept phase to the design, to the construction phase, until the use and maintenance of the infrastructure. The mentioned phases imply the involvement of different portfolios of projects internal to the organization. The concept phase may need a pre-involvement of the Research and Design portfolio of projects (not all the projects include necessarily an R&D phase). From the concept phase, the investment portfolio of projects flows to the design phase, then to the construction phase (after the necessary governmental approvals), and finally into the Maintenance portfolio.

The Public Road Administration has defined 5 strategic goals that are derived from the three sustainability pillars of economy, environment and society. The goals are: more value for money, efficient use of new technologies, contribution to Norway's fulfillment of its climate and environmental goals, vision zero -no fatalities or serious injuries-, and easier everyday mobility and increased competitiveness for business and industry. The Agency is supposed to measure its performance toward these goals, both at a company and at a portfolio level. For this purpose, a specific set of sustainability criteria has been defined by NPRA, especially tailored for the investment (construction) portfolio and the maintenance portfolio of the public administration (Figure 1).



Figure 1: the five sustainable strategic goals in NPRA, Statens vegvesen (Statens vegvesen sin virksomhetsstrategi | Statens vegvesen, 2024)

Focusing on the sustainability measurement at the portfolio level of the organization, the study has investigated, through informal information gathering meetings and documental study, the way sustainability is measured along the project process and along the different portfolios, focusing on the investments (construction) portfolio. The construction portfolio is composed by project selected by the Government that are previously analysed and prioritized by the Agency on the base of sustainability criteria and indicators. This evaluation is done in the early stage of the project, considering the three dimensions of sustainability: economy, environment and society. The department taking care of this phase is using the specific tool Effekt, previously mentioned. After the government's choice of the projects to finance, other departments are taking care of the projects and, at the present moment, the work to define specific indicators or tools for the sustainability measurement is ongoing.

Table 1: Comparison of indicators used in NPRA (Effekt program) and in chosen literature (Haavaldsen et al., 2012); the NPRA's indicators are also specified if or not priced

Criteria	Priced/ Not Priced	Indicators from Effekt program (Handbook V712, NPRA)	Indicators from chosen literature (Haavaldsen et al., 2012)
ECONOMY	P	Operator benefit	
	P	Budget consequence for the public sector	Infrastructure costs
	P	Residual value	
	P	Tax cost	Consumer costs
	P	Road user and transport users benefit	Mobility barriers
	P	Traffic accidents	Damage by accidents
			Non-renewable resources
			Accessibility
			Traffic congestion
ENVIRONMENT	P	Noise and air pollution	Noise and noise control Air pollution
	P	Greenhouse gas emissions	Climate change
	NP	Natural diversity	
			Non-renewable resources
	NP	Natural resources	Water pollution Effects of water resources
			Housing and households
			Deterioration
SOCIETY			Living standard of the local society
	NP	Outdoor life/city and rural life	Effects on health Consequence for handicapped
	NP	Landscape picture	Aesthetic
	NP	Cultural heritage	
			Equality
			Coexistence and discrimination
			Less expensive consumer products and services

The sustainability performance measurement method presented now has been evaluated in the next chapter using relevant chosen literature on guidelines for performance measurement (Andersen et al., 2021). The concepts described in the guideline to develop a performance measurement method toward a specific goal can be applied to the case of the sustainability performance measurement for the investment/construction portfolio of NPRA.

DISCUSSION

Using the principles described in performance measurement theory (Andersen et al., 2021), the NPRA's methodology for sustainability performance measurement in the early stage of the investment portfolio is analysed. In particular, the concepts of validity, reliability, completeness and coherence are discussed. The results are discussed in terms of pros and cons for both the indicators chosen and the process used to measure sustainability. Further work and improvements are proposed.

PROS AND CONS OF THE CHOSEN INDICATORS

The comparison between the indicators chosen by NPRA and the list of indicators shown in literature (Table 1), shows a discrepancy within each of the sustainability pillars. Even if both the methods shown are used within the same topic, that is infrastructures, there is no agreement on a unique set of indicators to measure the impact on each of the three criteria of economy, environment and society. This is clear also considering other literature sources from the same application field (Suprayoga, et al., 2020, Ugwu, et al., 2005).

From the perspective of measurement of performance, avoiding detailed evaluation of the specific measurement methodologies for every specific indicator and applying the general guideline considerations (Andersen et al., 2021), several considerations can be made.

The mentioned discrepancy in the indicators' list is somehow justified by the need of the actor to choose *valid* indicators. The validity of an indicator is connected to the ability of an indicator to "*correctly measure what it is supposed to measure*" (Andersen et al., 2021). Due to the different roles of the actors involved in a process and the possibility for them to gather and measure specific data, it is reasonable for them to choose indicators that they have the real possibility to control. In addition, it must be considered that the meaning of an indicator is specific for each company and specifically related to the company's activities. An example can be done also using an indicator whose use is very diffused and whose meaning has been generally agreed upon by the actors operating in the field, such as the indicator on *Emissions*. Depending on the specific role of the actor and on the data handled by the company, the same indicators could refer to different things, such as direct emissions, for example, produced by machinery, or indirect emissions, for example, related to the production of the material used, or third parties' emissions, dependent on the activities of third parties involved in the actor's activities.

The need for a specific choice for the indicators for each department has also been confirmed during the informal gathering meetings in NPRA and is traceable in the documents and tools used in the different phases of the projects. Furthermore, the literature review conducted shows that, in several fields of application, the preferred choice is to define a tailored list of sustainability indicators, especially to take into consideration the stakeholders' interest and to better support the company's approach towards sustainability (Warhurst, 2002).

This opens another consideration connected with the *reliability* of the chosen indicators, intended as "*the ability of an indicator to produce the correct value consistently over time*" (Andersen et al., 2021).

The specific departments need to define the specific indicators in the performance measurement, since these departments are connected, for example, with different phases of development of the same project, which means that, without a specific handling in the transition phases, it is not possible to check the same measurement in the next phase, characterized in practice by other defined indicators.

These specific departments' needs show a risk of compromising the reliability of the measurement along the process from the conceptual to the final stage of every single project. The possibility to transfer the measurement done on each specific indicator as an equivalent level for the related criteria in the phase stage could represent a solution for transferring the

information on the expected performance (at the criteria level) in the transition phase stage. Looking at the strategic criteria defined for the Public Administration, the sustainability criteria specified and the list of indicators used in the early-stage analysis for the investment portfolio (Effekt tool), it is clear that a specific definition of the interdependencies among the different levels of criteria and with the specific indicators is a necessary further step for NPRA to guarantee not only the reliability of the performance measurement, considering the project process from evaluation to design, construction and maintenance, but also to perform control on coherence and alignment of the projects with the governance.

A process where the performance of every phase is measured in terms of the same criteria, but with specific-phase indicators, could represent a way to guarantee both the validity and the reliability of the performance measurement system along the project process.

Finally, the *completeness* of the indicators could be discussed, in terms of the presence of the three main pillars of sustainability (economy, environment and society) in performance evaluation. The investigated literature shows, for example, a lack of focus on societal indicators (Sierra Varela, 2017). Applied practice (NPRA), shows a not coherent development of the topic along the portfolio development: while in the early phase of the portfolio (analysis of projects for prioritizing, using the tool 'Effekt'), the three pillars are clearly all present in the indicators' list, at a later stage (construction, maintenance), sustainability is confined to specific areas of interest that are not clearly covering the whole spectrum of criteria. For this purpose, it has to be specified that the 'sustainability strategy' for NPRA is under development, so further specifications are expected. In addition, the topic of sustainability in the construction phase (after the approval of the financing) for the investment portfolio is additional to the previous main control criteria method, based on time, cost and quality. If we combine the set of main goals defined by the public Agency with the sustainability strategic goals (Figure 1) recently presented by NPRA, we see that the chosen global set of criteria is within the four areas of sustainable criteria defined in some literature for performance measurement of Public-Private Partnership (PPP) Projects (Akomea-Frimpong, 2022).

PROS AND CONS OF THE ACTUAL PROCESS: THE PORTFOLIO PERSPECTIVE

The process of developing a project in NPRA (Figure 2) includes several stages from the expression of the public need to the design phase, construction phase and it concludes with the realization of the effect (object) on the society. This includes the collaboration of Private and Public actors and a transversal coherent definition and control, along the process, for the chosen criteria. This is the actual challenge for NPRA.

In the development and implementation of ongoing processes, the application of standardized approaches, like for example the DMAIC (Define, Measure, Analyse, Improve, Control) approach, often used in performance improvement programs (Koho, 2015), could be helpful for the public Agency. The goal, from a strategic long-term perspective, would be to apply the approach at the portfolio level, following the whole process for the projects. An additional consideration could be done on the separate visualization of the priced and not-priced indicators, and this could be useful also to develop the potential of the measurement system in a portfolio perspective. The validity of a measurement system itself is also dependent on the ability of the system as a whole to perform the intended measurement. While the two groups of indicators could provide information on the single measurement and globally on the countable and not-countable groups of indicators, the measurement system remains incomplete in terms of providing a single evaluation for the measurement applied for example to two different projects in the portfolio. For this reason, a system to visualize globally the measurement of all the indicators is suggested. Applying a weighing system among the single indicators and among the criteria, to reflect the relative importance in the strategic perspective, it would be possible

to use a spider diagram (Haavaldsen et al. 2012, Fischer et al., 2017) to show countable and non-countable indicators on the same graph.

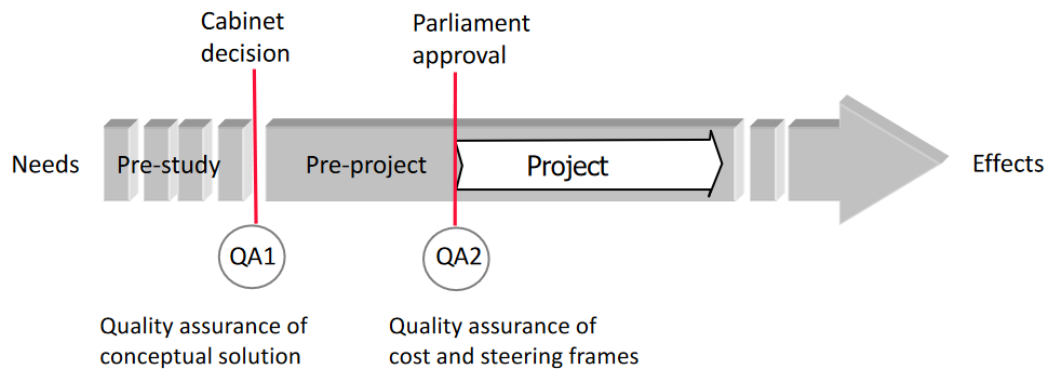


Figure 2: The Norwegian Quality Assurance regime for major public projects. Source: Norwegian Ministry of Finance. Samset and Volden (2016).

From a portfolio perspective, there is actually no consideration in the described tool of the eventual influences of a project on another. This means that there is no actual portfolio perspective, and it is therefore not possible to visualize eventual synergies for the global performance measurement in considering several projects together. Eventual synergies among different projects could give the possibility to enhance the performance of the whole portfolio for some specific criteria, always checking the effect on the global set of chosen performance criteria. A very practical example could be, for example, the possibility of treating the soil quantities in a project as a +/- requirement in a portfolio perspective: for a project that produces mass to disposal (from excavation, for example), another project could need soil for landfilling. The two parameters, that would score with a negative performance in a project perspective, would ‘compensate’ each other (in a simplified description of the topic) and not have a negative performance scoring for the environmental criteria in a portfolio perspective. The same example could be done on the possible positive consequence of different indicators if the portfolio perspective is used actively: a group of projects that could be realized with the same material would give the possibility, if managed in the same contract, to allow the market to offer a better economical offer for the same ‘quality’ (for example related to the CO₂ reduction-goals connected with material production) of the material, thanks to the possibility to buy larger material quantities. A negative score on the economic criteria for a single project could therefore turn into a positive performance score if the same project is handled in a portfolio perspective.

The need of improvement for portfolio management should be highlighted also in a multiple portfolios perspective: the actual system of sustainability performance measurement is also not consider the possible influences of the choices done on a specific portfolio on the other portfolios of the agency. For example, the possible impact of the choices made for the investment/construction portfolio on the sustainability performance of the maintenance portfolio. Another example could be the consequences of the choices made for the R&D portfolio, in terms of projects financed, for example in the future alternatives for new materials available for the infrastructures, both for the construction and for the maintenance portfolios

The performance measurement system is part of a management system (Andersen et al., 2021) and it is necessary to follow it in the various management modes, such as the strategic level, the day-to-day management and the improvements that are emerging along the management practice. As the criteria and the indicators are usually connected to different levels of management, it is fundamental to draw the connections between the different criteria and the single indicators with the specific criteria they belong to and follow the dependencies in a coherent way along the process, especially in the transition phases where different departments

or actors are involved. This is necessary also considering the timeline of a project development, to “*follow up in the whole process for the temporality of performance evaluation*” (Dalcher, 2012).

CONCLUSIONS AND FURTHER WORK

The paper is bounded on the case of NPRA as an organization focused on sustainability as strategic goal in the long-term-run. The chosen case study is one of the biggest actors in Norway, dealing with infrastructure management, involving different phases of the project development and from the concept to the design, construction and maintenance phase. Due to the long-term nature of the sustainable strategic goal, the importance of having an actor dealing with the whole project process and with an additional portfolio perspective, results in the possibility to investigate a perspective wide enough to generalize some of the conclusions. Nevertheless, additional data from similar organizations could give the opportunity to understand and share best practices, also in an international perspective.

The paper describes the sustainability performance measurement system, in terms of indicators and in terms of process, for the Norwegian Public Roads Administration, within the investment portfolio of projects, as an example of actor committed to develop the value stream in the long-term perspective. The performance measurement method applied for the construction projects and portfolio is therefore described and analyzed with respect to pros and cons, using relevant literature and performance measurement theory. The study shows that, at the present moment, the sustainability topic, as a combination of environmental, economic and social goal, is evaluated just in some phases for the project and just in a project perspective, missing possible synergies only possible in a portfolio level.

The study also highlights a lack of agreement in literature on the definition of sustainability in performance measurement. Specific focus on some of the sustainability pillars is underlined in part of the literature, while other publications adopt a more holistic perspective.

Using the findings from the performance measurement theory, applied to project and portfolio performance measurement focused on sustainability, further work is proposed for the improvement of the actual performance measurement system in NPRA. The actual choice of indicators in NPRA could be valid, reliable, and complete to measure sustainability, but the sustainability measurement is, by now, based on measurement done just in the early phase of a project and not followed up in a coherent way along the project development and construction. In addition, there is no portfolio perspective, so that all the possible synergies among the projects to enhance sustainability are lost. A general guideline could be helpful for the development of a specific performance measurement system for the infrastructure sector focused on sustainability. A dedicated tool could be designed and tested in the specific field applications, not only for the sustainability measurement of a single project but also to evaluate possible strategies in the portfolio management focused on optimizing the sustainability performance.

The challenges for the proposed improvements deserve a specific effort, especially in the general organization of the agency. To develop sustainable goals, it is necessary to implement the performance measurement system in a transversal way along the project process and in terms of portfolio management. Literature shows that the organizational structure has a great influence on the success in implementing the strategies in the portfolio (Petro, 2015). In addition, the perception of the organizational factors, in terms of transparency and performance measurement coherence and strategic alignment, is so important that can affect the performance of the agency's practitioners itself (Pellegrinelli et al., 2006), and therefore requires a dedicated endeavor.

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