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Quality assurance scheme in large public investment projects in Costa Rica

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Master of Science in Project Management
Submission date: June 2017
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Quality assurance scheme in large public investment projects in Costa Rica	Date: 11.06.17 No. of pages (incl. appendices): 162			
	Master thesis	X	Project paper	
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Abstract:

Quality Assurance Schemes are implemented by governments due to the necessity to ensure quality in the decision-making process during the front-end phase of a project. Costa Rica is also beginning to implement such schemes in their management of public projects. This research study addresses the differences between the Norwegian, British and Costa Rican schemes. It also points out the criteria considered for the choice of concept and describes the different forms of financing in Costa Rica. Three methods were chosen: a review of literature for the three countries, review of official documentation in Costa Rica and 10 interviews with mainly senior public officials in Costa Rica, responsible of managing public investment projects. The results present that the Costa Rican scheme has both similarities and differences with the British than the Norwegian models, mainly with the forms of financing. The criteria for the choice of concept in the Costa Rican system include technical, financial, legal and environmental issues, among others. The financing of projects in Costa Rica depend on the kind of institution proposing them and if it requires public debt. Finally, some recommendations are suggested to improve the system, according to the knowledge gained from the theory and the conclusions from the interviews. This pilot study provides a starting point for authorities to maintain an ongoing research regarding management of public investment projects. Besides, the thesis presents how the scheme is currently working, setting foundations for further evaluations to develop a more robust system.

Keywords:

1. quality assurance
2. public investment projects
3. front-end governance
4. Costa Rica

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Preface and acknowledgements

This research study has been conducted as the final project for the Master Programme in Project Management at the Norwegian University of Science and Technology (NTNU) and it was carried out during the spring semester of 2017.

The initial idea for developing such a project emerged from the knowledge of the Quality Assurance Scheme implemented in Norway, coupled to the questioning of the existence of a similar scheme and the desire for relevant and sustainable projects in my home country. The development of the scope of the thesis was discussed with my supervisor Tore Haavaldsen and my classmate Stavros Adamou, and it is seen from a stand of project management in civil engineering.

First, I would like to thank God, my family and friends.

I also thank the government of Costa Rica, through the Ministry of Science and Technology (MICITT), because without their help this would not have been possible.

Finally, I thank my supervisor Tore Haavaldsen and my classmate and friend Stavros Adamou for their participation in this project, as well as all the other people who were involved in this project, for as minor as their role could have been.

Trondheim, June 11th, 2017

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Esteban Alberto Castro Estrada

Summary

Governments around the world need to ensure quality in the decision-making process for public investment projects. Therefore, quality assurance schemes have been implemented, especially in developed countries. Costa Rica, a developing country, is also beginning to implement this idea of a scheme into its management of public projects.

This research study addresses the differences between the Norwegian, British and Costa Rican schemes. In addition, it presents a description of the functioning of the model implemented in Costa Rica. The research questions trying to be answered are:

- What are the main differences between the Norwegian, British and Costa Rican quality assurance schemes?
- Which aspects are considered in the choice of concept in the Costa Rican scheme?
- Which are the different forms of financing projects in the Costa Rican model?
- Which are the most relevant problems associated with the quality assurance scheme implemented in Costa Rica?

Three methods were chosen to carry out this study. First, a review of literature for the three countries, including the concepts and definitions that serve as theoretical background. Second, official documentation from Costa Rica was revised, aiming for thorough understanding of the scheme, including its background and regulations. Finally, ten interviews were conducted with mainly public officials, who are responsible of managing public investment projects, to document their experience with the scheme and their opinions about it.

The findings present the Costa Rican scheme having both similarities and differences with the ones from Norway and the United Kingdom, being the forms of financing projects the most significant. The source of financing for projects within the Costa Rican government vary depending on the kind of institution proposing them and if it requires public debt.

There is a guideline to assist the project managers with the choice of concept, in which several aspects are considered, and includes, among others, technical, financial, legal and environmental analysis.

Finally, several problems were identified regarding the current functioning of the scheme, which were identified by conducting the interviews.

After discussing the results and coming up with conclusions, some recommendations, believed as opportunities to improve the system, are presented. The most important ones are the implementation of a public investment law, employment of highly trained officials and spending more resources on front-end management.

In addition, recommendations for further research around the subject are presented, in an effort to keep the awareness on the importance of developing a well-functioning system that can bring Costa Rica back to a leading position in Latin America on public infrastructure.

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List of Acronyms

a.k.a	Also known as
AL	Legislative Assembly (acronym in Spanish)
AP	Budgetary Authorities, in Costa Rica (acronym in Spanish)
ARESEP	Regulatory Authority for Public Services, in Costa Rica (acronym in Spanish)
AyA	Institute of Aqueduct and Sewage, in Costa Rica (acronym in Spanish)
BCCR	Central Bank of Costa Rica (acronym in Spanish)
BPIP	Bank of Public Investment Projects, in Costa Rica (acronym in Spanish)
CCSS	Costa Rican Social Security Administration (acronym in Spanish)
CEO	Chief Executive Officer
CGR	General Comptroller of the Republic, in Costa Rica (acronym in Spanish)
CR	Costa Rica
DAC	Development Assistance Committee, in the OECD
HM Treasury	Her Majesty's Treasury (in the United Kingdom)
IAAP	Integrated Assurance and Approval Plan (in the United Kingdom)
IAP	Potential Environmental Impact (acronym in Spanish)
IMAS	Institute of Social Welfare (acronym in Spanish)
IPA	Infrastructure and Projects Authority
ISO	International Organization for Standardization

LANAMME	National Laboratory of Structural Materials and Models, in Costa Rica (acronym in Spanish)
LFA	Logical Framework Approach
MIDEPLAN	Ministry of Planning and Economic Policy, in Costa Rica (acronym in Spanish)
MIIA	Matrix of Relevance of Environmental Impact, in Costa Rica (acronym in Spanish)
MINAE	Ministry of Environment and Energy, in Costa Rica (acronym in Spanish)
MOPT	Ministry of Public Works and Transport, in Costa Rica (acronym in Spanish)
NTNU	Norwegian University of Science and Technology (acronym in Norwegian)
OECD	Organization for Economic Cooperation and Development
PMO	Project Management Office
PND	National Plan for Development, in Costa Rica (acronym in Spanish)
PNIP	National Plan of Public Investment, in Costa Rica (acronym in Spanish)
QA	Quality Assurance
SETENA	National Technical Secretary of Environment, in Costa Rica (acronym in Spanish)
SEVRI	Specific System of Assessment of Institutional Risk, in Costa Rica (acronym in Spanish)
SIA	Sustainability Impact Assessment
SIBDI	System of Libraries, Documentation and Information, in Costa Rica (acronym in Spanish)
UCR	University of Costa Rica (acronym in Spanish)

UK	United Kingdom
UNDP	United Nations Development Programme
UPI	Institutional Planning Units, in Costa Rica (acronym in Spanish)
VAP	Potential Environmental Viability (acronym in Spanish)

1. Introduction

There is a growing understanding about the importance of front-end management in the life cycle of public investment projects (Samset, 2010), or any project in general. Quality Assurance Schemes, also known as State Project Models, have been introduced in different countries of the world (Samset et al., 2016), aiming for project success and project management success (De Wit, 1988). This success is globally defined by 5 criteria, proposed by the OECD: efficiency, effectiveness, impact, relevance and sustainability (Chianca, 2008). Front-end management, and subsequently quality assurance schemes, are focused on the two latter. Relevance and sustainability are within the scope of strategic and tactical planning, as opposed to operational planning (Mikoluk, 2013). Costa Rica has recently begun to adhere to this tendency, understanding public investment as an engine to the economic system and development in general (MIDEPLAN, 2014).

1.1. Profile of Costa Rica

Costa Rica is located in Central America, part of Latin America, and it has been an independent nation since 1821. It is considered a developing country (United Nations, 2014), with a small territory of just over 51,000 square kilometers and a population of almost 5 million inhabitants. It has a mean income per inhabitant of around $10,400, as of 2015 (World Bank, 2017), and a corruption perception index score of 58, situated on position 41 in the world (Transparency International, 2016).

1.2. Background

Costa Rica was considered a leading country in Latin America in terms of infrastructure in the 70s. During the 80s, a recession hit the region, which led the country to experience an increase in financial debt. Trying to heal the economy, severe measures of economic adjustment were applied in the recent past, which were translated into cuts on public spending (especially public investment). These measures have created a deficit of economic infrastructure: insufficiency and poor conditions of the road system, as well as deficient systems of ports and airports, among many others.

Recent governments, starting in 2006, have opted to prioritize public investment again by developing a national system for planning public investment projects, with a culmination of a

state project model, understanding that enhancing the economy must include construction projects, and now public investment is seen as a dynamizer.

Therefore, a national system for planning public investment projects has been developed over the past years, with a culmination of a state project model, which can, at least theoretically, guarantee that the decisions taken around the formulation, selection and evaluation of the projects have been submitted to a systematic process, aiming for those decisions to be the most adequate as possible. This process includes both qualitative and quantitative analyses, taking into consideration economic, social, environmental and risk-to-disaster factors (MIDEPLAN, 2009, 2012, 2014).

In this matter, developed countries (United Nations, 2014) like Norway or the United Kingdom are leading the way in the implementation of a quality assurance scheme for their major public investment, with the stage-gate model (Samset et al., 2013) being used in both scenarios. The conception of these state project models was generated from cost overruns of the projects, and the necessity to allocate - and spend - resources in a way that ensures quality of the decisions, trying to overcome problems such as conflict of interests or lack of proper estimations, just to name a few.

1.3. National System of Public Investments (SNIP) in Costa Rica

The National System of Public Investments (SNIP) was created to, as a main function, develop the processes of assignation, execution and evaluation of public investments which are adhered to the priorities established in the National Plan for Development (PND), (MIDEPLAN, 2012b).

The institutions require assessing and improving the procedures and instruments of identification, formulation and selection of projects for the process of public investment. Likewise, proper conditions must also be established in the institutions, which allow training of the human capital in order to fulfill those objectives.

The development and strengthening of the SNIP has implicit the constitution of the Bank of Public Investment Projects (BPIP) (see Appendices E and H), the formulation and follow up of the National Plan of Public Investments (PNIP) and the establishment of methodological guides and technical standards of programming public investment for Costa Rica.

The specific objectives of the SNIP are (MIDEPLAN, 2012b):

- To achieve that the public resources, which are destined to public investment, give the maximum economic, social and environmental benefit to the country.
- To implement an integral system of analysis, follow up and evaluation of public investment, following the life cycle of the projects.
- To efficiently program and manage the public investment.
- To provide enough and quality information for the decision-making about investments.
- To strengthen the capacity of all the public sector on the processes of formulation and programming of public investment.
- To facilitate the annual and multiannual programming of public investments.
- To keep an updated inventory of all the public investment projects.

The PNIP is presented as part of the effort put by the Government to the creation and operation of the SNIP, with the purpose of arranging public management and improve the quality of institutional execution projects.

Developing this task required to know the investment initiatives available by the institutions, conforming a project inventory as a base to the creation of the BPIP. This task involved permanent consultation with institutional planning entities, later allowing selecting the feasible projects to include into the PNIP.

This plan constitutes the base which will orient the institutional action on the operationalization of the public investment processes, having as a main objective to ease the conditions for future administrations, in order to improve the timely decision-making about public investment projects that need to be executed, as a part of a construction-oriented policy of a more equitable and competitive society.

The investment policies established on the PND 2006-2010 are oriented to create and resume the pre-investment capabilities in the institutions, with the purpose to improve the quality of the projects and solve the programming and execution problems on investment, through more allocation and efficiency on the use of public resources that can be used on public investment.

Financing public investment constitutes now one of the national priorities, given the necessity to resume the processes of pre-investment, investment and operation of the projects that the country needs to undertake.

The National Plan for Development 2015-2018 "Alberto Cañas Escalante" contains the strategic pillars, priorities, objectives, programs and projects that are indispensable, as well as the model of public management necessary to move forward towards a society based on equity, knowledge, innovation, competitiveness, transparency and sustainable development (MIDEPLAN, 2014).

1.4. Problem formulation

Authorities in Costa Rica have shown efforts to elaborate a structured scheme, which can control, in a standardized way, the public investment projects, assuring a good project management including the front-end phase. Despite these efforts, several problems have arisen with the projects, seen from a citizen perspective.

Over the years, many projects have been interrupted or delayed because of environmental, cultural or financial reasons. This situation is easily identifiable by reading or watching the news. The mentioned problematic is the main reason for conducting such a study. In addition to those problems, several others are now present, directly related with the implementation of the quality assurance scheme.

The main challenge faced by the Costa Rican government is to change the mentality of the people responsible of managing public projects. Establishing a new scheme that has a systematic approach and changing the practices used for many years becomes a difficult task. Constant training and hiring specialized officials are the tools for the government to face these challenges. On top of that, the law has not yet been established in a proper way to guarantee that all the institutions within the government adjust to the scheme. In addition, the government has a very complex system, where different institutions become responsible for managing projects, depending on the sector and financial situation of it.

Attempting to solve these problems needs a full understanding of the scheme, which is why they are presented as part of the results. Furthermore, by stating the problems encountered, the discussion is presented in a way that aims to suggest measures to solve them.

The problems described later were gathered by interviewing senior public officials within the government, who are responsible of handling the quality assurance scheme from their own institution, which creates an approach to the problem from different points of view. All the officials interviewed were asked about the process followed to manage public investment

projects, as well as their impression on how it works and how it could be improved, considering the environment that surrounds the scheme.

The research questions this thesis aims to answer are:

- What are the main differences between the Norwegian, British and Costa Rican quality assurance schemes?
- Which aspects are considered in the choice of concept in the Costa Rican scheme?
- Which are the different forms of financing projects in the Costa Rican model?
- Which are the most relevant problems associated with the quality assurance scheme implemented in Costa Rica?

This study was inspired by the works of the Concept Research Programme at NTNU, which has published and compared state project models from several first world countries and attempts to find similarities and differences, looking to give an assessment of the current situation in Costa Rica.

1.5. Scope of the study

The General Project Model (Samset et al., 2013) includes three main phases of a project. The interest of this research is limited to the front-end phase, when the influence on decisions do not affect negatively the project as much as in later stages (Samset, 2015). This research is mainly focused on the project concept choice and the problems encountered around it.

As of the definition of project, which is very wide, it is important to mention that this research only refers to public investment projects within the construction sector.

This study is carried out from an international perspective, given the fact that it is conducted in Norway, having studied the Norwegian scheme, and comparing it with the British and the Costa Rican. Including more countries, especially developing countries, in the comparison would have been ideal, but the time constraint made it impossible.

The interviews do not represent a large sample, and more public officials could have been interviewed, assuring to leave out the least amount of problems encountered. However, again the time constraint played an important role, in addition to the fact that the study was conducted mainly from Norway, with only a limited amount of time in Costa Rica to carry out the interviews.

1.6. Proposal of a conference paper

Based on the results of this research study, a proposal for a conference paper was sent to the International Conference on Project Management (ProjMAN 2017). The paper sent has the title "Quality assurance scheme for public investment projects in Costa Rica", which has a scope of presenting the main characteristics of the scheme, discussing some of the issues extracted from the interviews with public officials.

Stavros Adamou appears as co-author of the paper, and the author of this thesis appears as a co-author of his paper. Both conference paper proposals are found in Appendices A and B.

1.7. Structure of the thesis

This research study is divided in 11 sections or chapters:

- The first section introduces the reason for the research, why it was chosen and the intended outcomes from it. It also includes the scope and limitations of the research.
- The second chapter presents the research methodology, which explains the literature and official documentation review, as well as the interviews conducted to obtain the results. This chapter also includes lessons learned about the methodology chosen and the limitations around it.
- Chapter 3 presents conceptual definitions about project governance, which serve as a theoretical background to the study.
- Chapter 4, in the same way as the third chapter, presents the theoretical background about the project concept choice, focusing on the front-end phase, which is the phase of the project this thesis focuses on.
- The fifth section introduces the quality assurance schemes of Norway, the United Kingdom and Costa Rica. A comparison table is presented, which is later addressed in the discussion chapter.
- Chapter 6 presents the criteria for the choice of concept in Costa Rica, extracted from official documentation published by the Ministry of Planning.
- Chapter 7 aims to explain the different forms of financing projects in the public sector in Costa Rica. This chapter was developed based on some of the interviews with senior public officials responsible of handling the State Project Model.

- Chapter 8 mentions and describes the different problems encountered in the Costa Rican scheme, based on the different interviews with the public officials. These are the main results from the study, since it describes the information gathered by direct contact with people responsible of public investment projects, which makes their perception highly valuable.
- The ninth section discusses the results presented in chapters 5, 6, 7, and 8, ending with recommendations for improvements to the Costa Rican scheme.
- The conclusions, recommendations and proposed further worked are presented in section 10.
- In addition, the appendices have information, which, although not being in the main text of the project, is complementary to all the findings gathered, but in a more extensive way.

Figure 1-1 illustrates the structure of the thesis.

Figure 1-1. Division by chapters of the research report's structure

2. Methodology

The problem formulation of this research study is focused on investigating the quality assurance scheme implemented in Costa Rica by the authorities and finding out issues related to such scheme. The results provided in this study were obtained by studying three sources. First, a review of available literature was conducted, finding relevant concepts and definitions, as well as documentation about the quality assurance schemes of Norway and the United Kingdom. Second, legislation and official documents from the Costa Rican government were revised to fully understand the model. Finally, ten interviews were conducted with Costa Rican senior public officials and one journalist.

This thesis was conducted using a qualitative research strategy (Bryman, 2015), which uses the theory to achieve conclusions, as well as the interpretation of such theory. A qualitative approach was used because the nature of the study does not present the possibility of doing otherwise, since it refers to the implementation of a structured methodology and the experiences of those who have worked with it.

2.1. Literature review

Addressing the literature review, including collecting different books and articles, was conducted using a scoping review (Arksey et al., 2005). Looking for relevant literature can be exhausting and time consuming if not done properly. Following the recommendations stated by Van Wee et al. (2016), the databases used, key words and the search strategy are explicitly reported. The following searching procedure was used:

1. Using a key word to search for literature in database
2. Getting an amount of results
3. Modifying the key word to obtain fewer and more relevant results
4. Screen the titles
5. Exclude the ones that are not relevant
6. Screen abstracts of the relevant ones
7. Include the relevant ones to the paper
8. Read the full text

Oria, the academic library in Norway, was the search engine used, due to the previous knowledge of the research done around the topic, and mainly because one of the models studied is the Norwegian. First, "quality assurance" was introduced as the key word. Since the general objective of the project is to study different quality assurance schemes, these two are the first key words to be used in the search engine. Unsurprisingly, the number of results was huge, 538,115 results to be precise. Just by looking at it, the amount was considered excessive and time consuming, and it was decided to search for better key words to narrow down the results.

The next search was done using the "Advanced Search" option. The phrase quality assurance was combined with projects, in the following way: "quality assurance AND projects". The new amount of results was 8,317. Although it was reduced considerably, it was still considered a large sample, for which a better use of key words was needed.

By doing a quick overview of the results, it was seen that most results were not related to construction, which is exactly the main focus for this research. Therefore, using again the Advanced Search, the new input was: "quality AND assurance AND investment AND projects". This time, 159 results were obtained, and then it was finally accepted that a deeper research can be done with this amount of entrances.

The next search performed with Oria was related to the front-end phase of projects, therefore it was decided to start the research with the key words "front-end assessment", which gave 2,155 results, which are too many to be considered. Using the Advanced Search option again, it was decided to have a new set of key words. "Front-end AND projects" was the input, but the amount of results was even higher, with 6,160 items. It was decided to narrow it even further using the following key words: "front-end AND projects AND governance", which gave 73 results, considered to be an amount that can be handled more easily.

To look for literature in Costa Rica, the SIBDI-UCR search engine was used. SIBDI stands for Sistema de Bibliotecas, Documentación e Información (System of Libraries, Documentation and Information) and it is, as the name says, the system of libraries for Universidad de Costa Rica (University of Costa Rica - UCR), the biggest university in the country. Their search engine is open to the public, although loan of books and different material is not.

The first key words used were "proyectos inversión", translated to investment projects. The first search gave as a result 246 items, which are considered a large amount, but since there was uncertainty on what one could find in such a search engine, it was decided to have an overlook of it. After going through a few pages of results, an interesting title came up and it was decided

to go deeper into it. Unfortunately, the abstract was not available at the SIBDI webpage, so the only way to find out if the article was relevant was to look for it through Google, having the advantage of knowing the full name of the book. The full book was easily downloadable because it is a public document from the Ministry of Planning, and later proved to be the starting point for finding all the literature around the subject.

It is important to mention that, while using the search engines gave useful and relevant findings, most of the books and articles were obtained by the references found in studied documents, since the findings of one article or book led to another reference, which led to another one successively. This created a sort-of branched methodology of finding relevant literature (DMU Leicester, 2013). Specifically for the research about the Costa Rican model, it literally happened like that. The first document was found, and it referenced one law, which cited another guide, and so on.

The most important lesson learned with this approach is to keep track of the found references, by taking notes, downloading the documents or assessing them immediately. This way, none of the relevant information was left out.

2.2. Official documentation

As mentioned before, one document opened the path to finding the rest of the official documentation relevant for this research. The mentioned document was the General Methodological Guide for Identification, Formulation and Evaluation of Public Investment Projects, found complete on the Ministry of Planning's website.

The guideline included the references to the different documents used to describe the scheme in this study. It also references the laws and executive orders that pertain to the scheme.

An important advantage encountered by reviewing these documents was that they were easily downloadable from the ministries' websites. In addition, they were organized in a way that made it simple to find them.

The guides and supporting laws were mainly obtained from the Ministry of Planning, which is the institution responsible for carrying out the quality assurance process in Costa Rica. In total, there were nine official documents revised, including guides, laws and executive orders, to understand the model from a theoretical stand.

2.3. Interviews

The last source of information was obtained through 10 semi-structured interviews with Costa Rican authorities to fully understand the functioning of the project model. Interviews, as a mode of data collection, were chosen to place the information found in the literature and official documentation in a real and practical context, understanding them as the most important method of collecting data (Yin, 2014).

They were prolonged case study interviews (Yin, 2014) with variable duration, but mostly between one and one and a half hours, with people working in different institutions within the Costa Rican government, who are directly related with the formulation, approval or financing of public investment projects. These interviews include a protocol and a format in accordance to the General Interview Guide Approach (Turner, 20120). This kind of interviews have the particularity of being more structured than the informal interview, but with flexibility in their compositions. That way, the questions and the conversation may change a little while the interview develops, although a general path must be followed throughout the meeting. Appendix I presents the interview guide followed, including the institution, date and duration of each interview.

All the interviews were recorded, with the purpose of having full attention to the interviewee and keeping the constant flow of conversation, instead of stopping constantly by taking notes. In addition, having the possibility to listen to them again gives an opportunity to extract information that may have slipped through the notes. All the interviews were conducted in Spanish and the results were translated to English in the results chapters.

2.3.1. Selection of interviewees

The selection of the people to be interviewed was made according to their role handling the scheme and the institution they work in, as well as their availability and their response to emails or phone calls.

The first and most important interview selected was at the Ministry of Planning. Since the majority of documentation was published by MIDEPLAN, it only made sense to start interviewing there. The Ministry of Finance, initially thought to be the only institution responsible for financing projects in Costa Rica, was the obvious second choice.

The majority of the other interviews were chosen by recommendation from the ones at the Ministry of Planning and the Ministry of Finance. Those institutions were mainly selected for different reasons:

- They implement the largest projects, which means they have a more structured UPI
- They don't carry large projects at all, which represents a different point of view to the scheme
- They are a decentralized institution (this may include the two previous)

These different characteristics give a broader perspective of the scheme, since it presents the possibility to see it from different points of view. Most of the governmental institutions chosen has a department of planning, a.k.a. UPI, which has the complete responsibility of adjusting to the scheme and entirely carrying out the projects.

In addition, two more interviews were selected. One with a deputy of the Legislative Assembly, to get to know their opinion on the laws and processes surrounding the SNIP. This interview was also chosen because most projects are now financed through international loans, and the Legislative Assembly is responsible of the final approval, thus having contact with someone who directly has an influence on the final decisions was considered important.

The final interview was with a journalist from an important television network in Costa Rica, who has done research and has uncovered the way public investment projects have been handled by the authorities.

2.4. Analysis of results

The results are presented in four main chapters:

- The Norwegian, British and Costa Rican schemes
- Criteria for the choice of concept in the Costa Rican scheme
- Financing projects in Costa Rica
- Current problems found in the Costa Rican scheme

The first results chapter sets up the ground for a comparison between the schemes of each of the country selected. Norway and the United Kingdom were selected as a ground for comparison because of the knowledge about existence in literature about them. Furthermore, these countries have a well-structured quality assurance scheme, which is beneficial for

establishing a comparison, keeping in mind the differences between a developing and a developed country, the population and demographics, with the purpose of scaling the recommendations down to the Costa Rican level.

The criteria for the choice of concept is a descriptive chapter, important to understand the reasons to implement a public investment project in Costa Rica. It is important to mention that this chapter is extracted from official documentation, and sets up the ground for comparison against the data collected in the interviews.

Financing projects in Costa Rica has many different scenarios, especially it being a developing country, which has to resort to international cooperation in also different forms. This chapter aims to describe how the different scenarios of financing projects are. This chapter is extracted from the interviews, given the fact that gathering such information turned out to be very difficult, since it is spread out through different official documents, laws and regulations, which also are published by different institutions in an inhomogeneous manner.

The last results chapter presents the current problems found in the Costa Rican scheme, extracted entirely from the interviews conducted with the different senior public officials and the journalist. This chapter sets the ground for discussion about the differences with the theory and the solutions suggested.

2.5. Limitations

This research study was done for writing the master thesis in the MSc. Project Management programme at NTNU. Therefore, the time limit for it is of one academic semester, which runs from January 15th to June 11th. An initial literature review was conducted during the previous semester, Fall 2016, required for the Specialization project, one of the subjects part of the programme. This literature study was extended to suit the objectives of the master thesis, defined by the proposal of the research questions.

In addition to the literature study and the review of official documentation, a series of interviews was conducted to obtain the presented results. However, the time to carry out these interviews was limited to only two weeks, which was the time available in Costa Rica. The rest of the study was conducted in Norway.

Another important limitation is the ignorance of similar studies conducted in Costa Rica. There is no direct contact with the academic environment in the country right now, since this research is done in Norway.

The comparison between the schemes of Norway, United Kingdom and Costa Rica may seem irrelevant, given the contexts of the two former countries compared to the latter. It would be more appropriate to perform a comparison with other Latin-American countries. However, these countries were selected because there is literature available in English, which is the language of the programme and of the research study. Furthermore, from a country's stand, it is always advisable to aim to achieve processes that are proved to be working effectively. In addition, having an international perspective on the results sets a bigger purpose for future analysis.

It is also important to mention that all the official documentation regarding the scheme was unmanageable to revise in such a short time, just as the description of the schemes in Norway and the United Kingdom.

There should have been a higher number of interviews with the Costa Rican public officials. When it comes to situations experienced, the input every individual has to give may turn to be somewhat subjective, and may not necessarily represent the feelings of the majority. Therefore, more interviews should have been made to validate the results found. In addition, going back to the interviewees to discuss information identified in later interviews would have been ideal to obtain a broader picture of the scheme. A particular interview should have been performed with the CGR, but it was not possible to obtain in the time frame stated.

Processing the information immediately after conducting the interviews would have helped to be more accurate on further interviews, gaining experience on how to handle it and conducting it to the discussion desired. Again, time was a major constraint, since the interviews were carried out on a span of two weeks, many times being on consecutive days.

Regarding the scheme, more topics could have been discussed. One important subject that was left out was the consideration of alternatives. As shown on Appendix F, alternatives are required to be evaluated, but the scheme does not state how it should be done. Every institution has a different way of doing this, and it is important to get to know these methods.

Being this a preliminary study, not all official documentation could be revised, especially because there is a great number of documents and there was an important limitation on time.

There are guidelines for many sectors, in addition to the general one, and it is important that these are investigated too.

3. Project Governance

3.1. Governance

The Institute on Governance (undated), on its website, defines governance, in a very simplistic way, as the art of steering societies and organizations, stating that it is about the more strategic aspects of steering, making the larger decisions about both direction and roles.

Nevertheless, it cannot be assumed as a straightforward process, because governance is complicated by the fact that it involves multiple actors and not only one responsible for the steering. In that sense, governance determines who has power, who makes decisions, how other players make their voice heard and how account is rendered. All these characteristics, of course, cannot be assumed by a single person or entity.

According to UNDP (2011), there are institutional qualities and governance principles that are critical for developing and implementing effective and equitable policy measures. These institutional qualities are performance, adaptability and stability. The main governance principles are participation/inclusion, non-discrimination/equality and rule of law/accountability.

The Concept Program summarizes in its report number 47 (Samset et al., 2016) the "Six Principles of Good Governance" proposed by the OECD (2002):

- Accountability: that the authorities have the ability and willingness to show whether decision and practices are in conformity with clearly defined and adopted objectives.
- Transparency: that decisions and decision-making processes are sufficiently transparent to enable the public sector, as well as civil society, to gain adequate access to information in relation thereto.
- Effectiveness and effect: that government deliverables are of sufficient quality, and delivered cost effectively and in such manner as to realize the purpose of such deliverables.
- Responsiveness: that the authorities have the capacity and flexibility to respond swiftly to the needs of society and in the public interest.
- Vision: that the authorities are able to anticipate future problems and needs based on existing data and trend information, and to take into account any expected changes and the costs associated therewith.

- Rule of law: that the authorities ensure that projects are implemented in compliance with applicable laws and regulations.

3.2. Project Governance

Project governance is a decision-making framework that guides the development of a project and within which the critical project decisions are made. This implies that within a properly designed governance system, the relation of the project with the whole development policy of the government will be identified, the real problem and why an activity initiative is selected will be analyzed, stakeholders will be informed and allowed to be involved, cost-benefit analysis will be conducted in a better way, and an analysis of what the people and politicians want will be done. Moreover, there will be an investigation to check whether the proposed project is possible (Shiferaw et al., 2012b).

Poor project governance leads to project failure. On the other hand, effective project governance positions a project for success. Good project governance allows effective and efficient decision making - that is, the right people making optimum decisions that meet the needs of the project and its stakeholders and making those decisions in a timely manner (Garland, 2009).

According to De Wit (1988), the measurement of time, cost and quality should not be confused with measuring success. When attempting to measure success, one must make a distinction between project success and the success of the project management effort, as the two although related, may be very different. The project is considered an overall success if it meets the technical performance specification and/or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people in the parent organization, key people in the project team and key users or clientele of the project effort.

Therefore, one project can be considered successful even when it did not fulfill one of all the project management success criteria: time, cost and quality. At the same time, one project delivered ahead of time, without cost overruns and of excellent quality can also be considered a complete failure, from the project success point of view. Good project management can contribute in the direction of project success but it will most likely cannot prevent project failure.

The main problem seems being that there exists a gap between the project managers' conception of success as delivering within time, quality and scope, and the top management's success

measure as realizing the long-term benefits that constitute the original motivation for initiating the project (Cooke-Davies, 2002). However, there are direct and indirect links existing between project success and corporate success, and they contribute to the creation of additional corporate value - and sustained long-term value is the ultimate measure of corporate success.

The term value proposition either addresses the question of how to create value in an internal strategic meaning or is addressed to the supply side to explain how the specific product should provide value for money. When initiating projects, the project owner should explain what kind of value the project is to produce, i.e. the effect on the core activities. Therefore, the value proposition becomes an explanation of what use value the project is intended to enable, in accordance with the owner's strategy (Hjelmbrekke et al., 2014).

For Hjelmbrekke et al. (2014), the supplier consequently needs to be able to propose relevant solutions to the project owner to secure use-value. The customer value proposition clearly states how the supplier is going to create the relevant value for the customer and thereby the tangible business results that the customer expects. The main requirements to the supply side in a customer value proposition are the understanding of the demands to the value creation, explaining what is possible to deliver and how the impact will be, and explaining how it can be delivered.

The concepts of value proposition and customer value proposition are illustrated in figure 3.1.

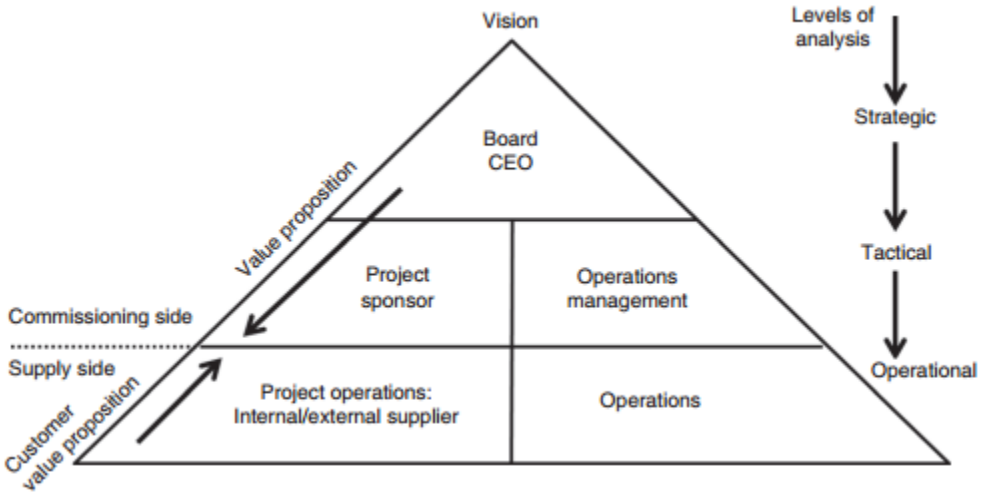

Figure 3.1. Value proposition and customer value proposition in projects (Hjelmbrekke et al., 2014)

3.3. The Project Model

The Concept Programme defines a project model as a standard classification of project phases with specific decision points and corresponding documentation requirements (fig. 3.2). The decisions are made at particular critical stages, and a project cannot proceed to its next phase until it has received "green light" to go ahead (Samset et al., 2013).

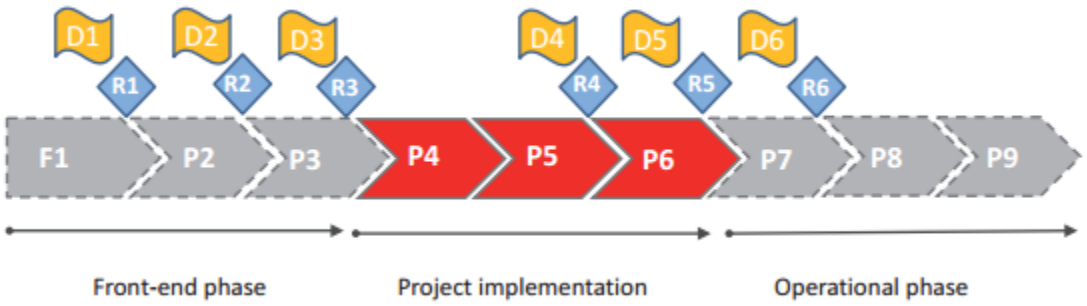

Figure 3.2. General Project Model (Samset et al., 2013)

According to the Concept Report, the Norwegian Ministry of Finance has defined the following project phases:

- Idea phase
- Pre-study
- Pre-project
- Engineering phase
- Implementation
- Start up
- First year of operation
- Adjustment/completion after the first year of operation

This is a general model for all major projects in several sectors to ensure good governance at a higher level. The scheme is meant to strengthen the professional quality of decisions documents upfront by introducing the decision points, also known as decision gates.

4. Choice of concept

4.1. The Project Concept and the Right Project

Following the approach of Samset (2010), used to describe the evolution of projects, a concept is a mental construction intended to support the solution of a problem or the satisfaction of a need. The notion of concept here is principled in the sense that dissimilar concepts may be alternative solutions for the same problem. Therefore, the task becomes to identify and test all these concepts to determine which one is the best, which will be chosen as the starting point for designing the project.

The concept is concerned with the economic and social aspects of the project, as opposed to the technical aspects (Williams et al., 2010). Many projects are troubled by not having a concept development phase, being decided up front, without studying or assessing different alternatives, including the zero alternative, which consists in continuing as before, with no major investment but with adjustments necessary to make it feasible.

In the words of Haavaldsen et al. (2012), professionals are commonly occupied with "doing the projects right", but the matter should be taken one step back, with actually "doing the right projects". The latter is not is not about making a good design, it is about agreeing about what is the purpose of the project in the first place and choosing a conceptual solution that serves the purpose well. It may also be about defining alternative concepts that also can be expected to make the difference the society needs them to, for politicians to be able to select the one that seems to have the best chances of serving the purpose in the end, which makes it the "right project".

Combining the definitions of Weaver (2007) and Shaw (2003), the choice of the appropriate projects requires an effective front-end project governance process, to meet the expectations of key stakeholders. Because of this, it becomes very important to establish a project governance model that would facilitate decision-makers to anticipate, understand and act around the consequences of their choices and decisions.

The governments of Norway and the United Kingdom have established governance systems to ensure best practices in planning at the front end (Shiferaw et al., 2012a).

4.2. Front-end phase of a project

A project can be divided into three simplified phases, according to Samset (2010): front-end phase, implementation phase and operational phase. The front-end phase, which is the focus of this study, goes from the time initial concepts are conceived until funds are appropriated to the project. This division parts a bit from the common way of splitting the life cycle of a project, where the different phases are: identification, definition, pre-appraisal, planning, implementation, operation and termination, with some of them overlapping, and it is unclear to know where one starts and the other begins.

With the aforementioned concept, the distinction is made between concept development and detailed planning. Concept development starts out with an overall analysis of needs, problems and requirements in order to identify the most feasible project strategy, the project's main features and its objectives. This process aims to identify the overall generic concept and the different concept alternatives that should be considered. The front-end phase of the project can be observed in figure 4.1.

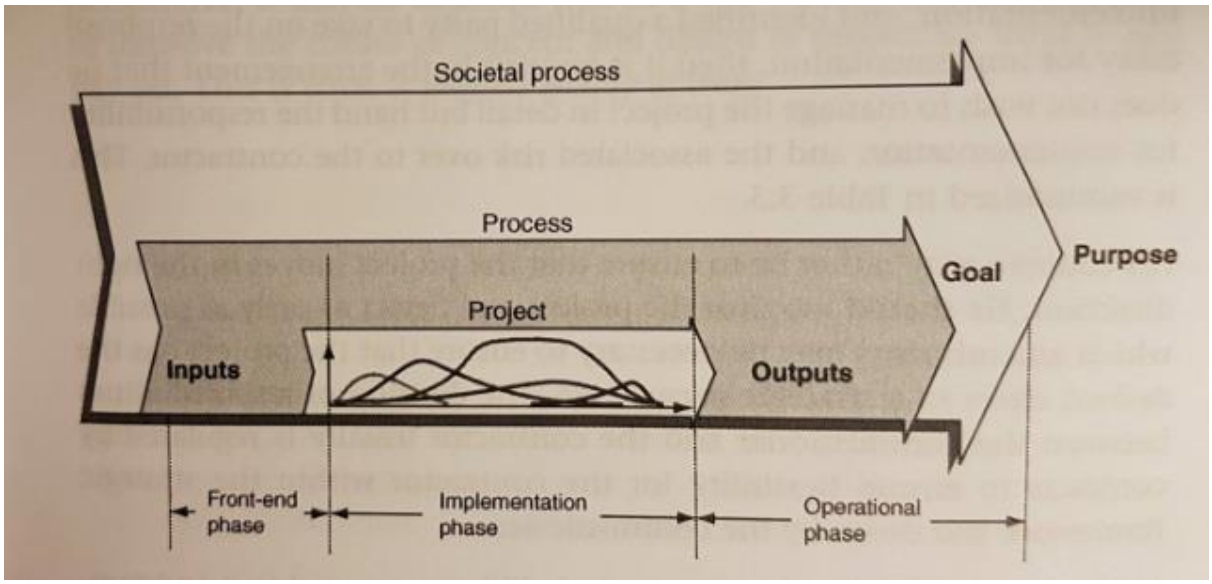

Figure 4.1. The project as a part of a larger process, considered in a societal perspective (Samset, 2010)

The processes that precede the project (Samset, 2010), can be defined as:

- Making of pre-studies
- Identification of the concept
- Considerations of alternative solutions
- Involvement of stakeholders

- Negotiation of funding

The concern is essentially on the purpose and on how well it will be served by the outputs of the project.

Terms for the project are defined in the front-end phase. At that stage, the possibilities to influence are greatest and the knowledge of what lies ahead is least. The influence possibilities diminish as decisions are made, alternatives chosen, strategies determined, contracts entered and work begun and finished in the project phase (Samset, 2010). On early stages, the project goals and constraints can be changed without incurring in higher costs in the end. This principle can be observed in figure 4.2.

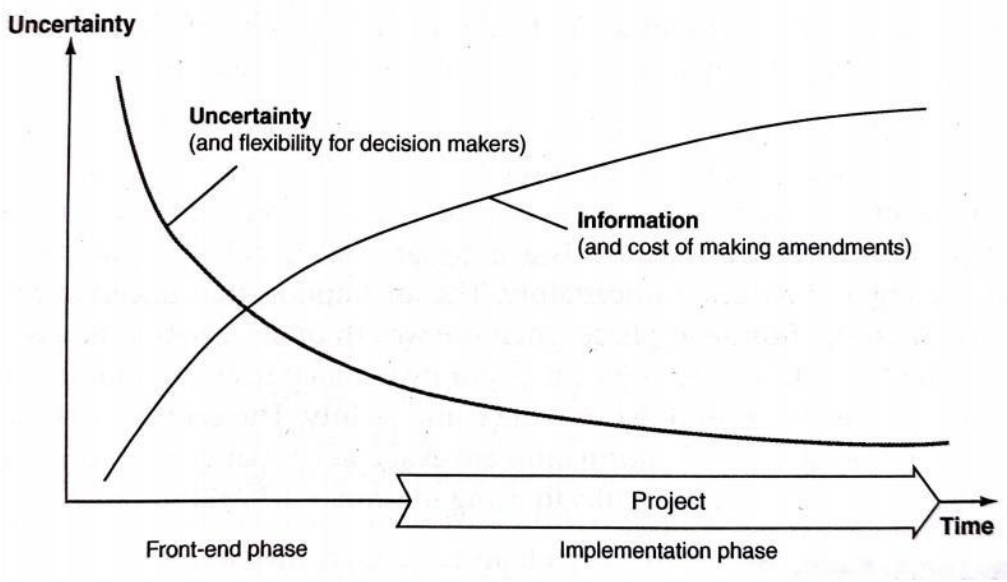

Figure 4.2. Managing uncertainty in the different phases of the project (Samset, 2010)

Williams et al. (2010) give various reasons about the estimation of costs in the project during the front-end phase, where it is most common to have underestimations, many times done it purposely. This is also exposed by Flyvbjerg (2009), with the concept of "pervasive misinformation", with the use of underestimation as a tool to have the project being considered in quality assurance schemes. This is illustrated in figure 4.3.

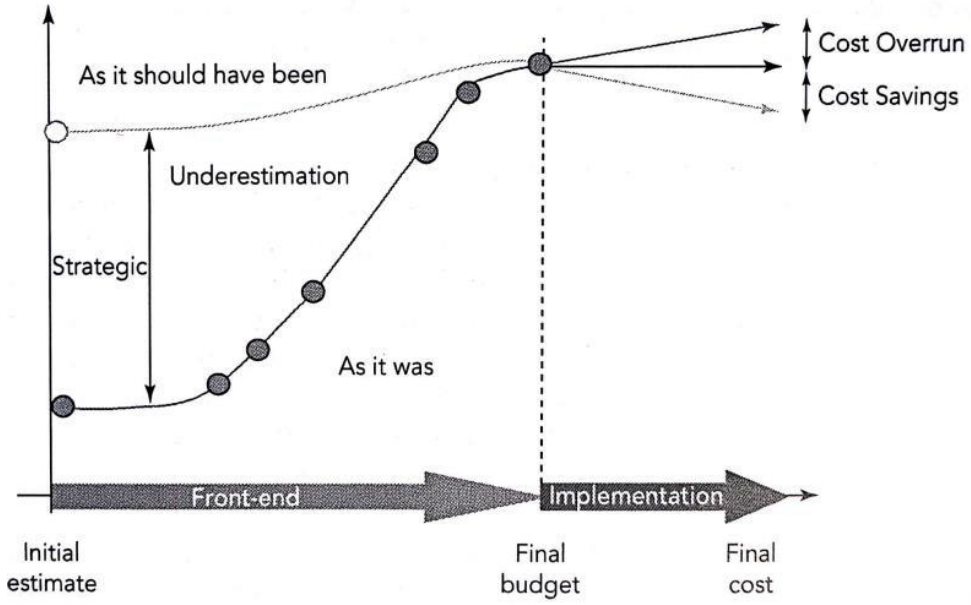

Figure 4.3. Up-front underestimation of cost (Samset, 2008)

Figure 4.4 illustrates the overestimation of benefits, which is the inverse approach to the last issue mentioned. Here, the forecast of benefits is very high, but after the project is completed, they are proven to be much less than initially expected. A cost estimate half of what is realistic, combined with an estimate of benefit that is double, results in an anticipated benefit/cost ratio four times higher as it should be (Williams et al., 2010).

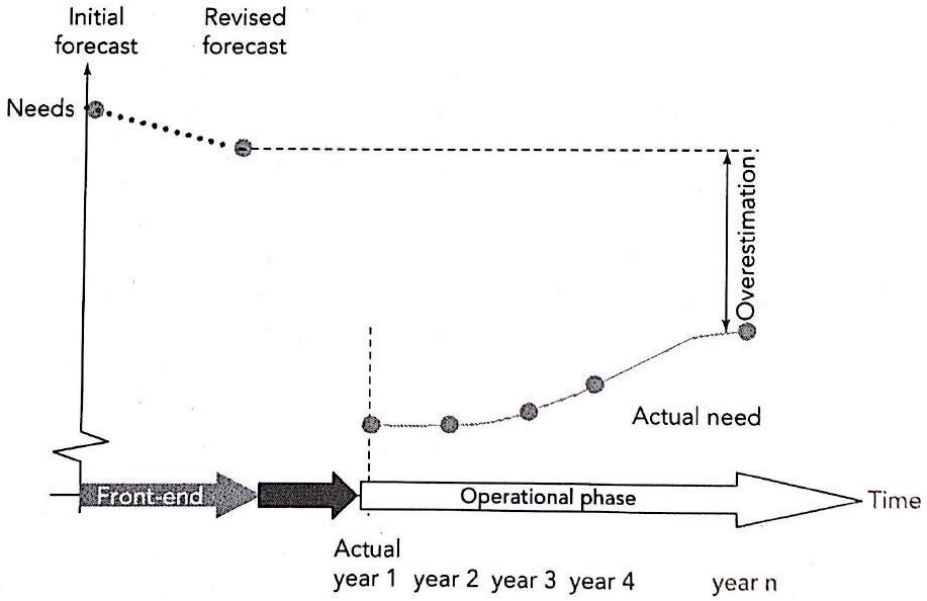

Figure 4.4. Overestimation of benefits (Samset, 2008)

4.3. Perspectives on a project

Project stakeholders are individuals, groups and organizations who are actively involved in the project, or whose interests may be positively or negatively affected as a consequence of project execution or project completion. Usually many groups of stakeholders, external and internal, are associated with a project, ranging from those directly involved to those indirectly affected (Samset, 2010).

According to Samset (2010), the key direct stakeholders are the commissioner, the contractor and the users. Their roles and objectives are summarized in figure 4.5.

The attention of project contractors is directed at the production of project outputs, with a focus on cost, time and quality. This is the most restricted and shortsighted perspective to assess projects.

Users are more concerned with the utility of the project and less concerned with its actual implementation, therefore they assess the project from a broader perspective, leaning to achieving the project goal.

The commissioner, also called project owner, initiates the project and provides direction and resources for its implementation. The commissioner normally has a perspective beyond of a user. A society has a perspective that comprises the combined impact of the project on society as a whole. This is what is called the project's purpose, the highest-level objective and expresses the long-term consequences of a project. Private investors normally place greater emphasis on the value added or profitability, while public investors will emphasize public utility.

The different stakeholder perspectives can be associated with the three different levels of planning, cited by, among many authors, Mikoluk (2013): strategic, tactical and operational.

A strategic plan is a high-level view of the organization, its vision, objectives and value. It is the foundational basis of the organization and will dictate decisions in the long-term. The strategic plan must be forward looking, robust but flexible, with a keen focus on accommodating future growth. The strategic plan is on the same level of the purpose, the objective chased by the commissioner.

The tactical plan describes the tactics the organization plans to use to achieve the ambitions outlined in the strategic plan. The tactical plan is a very flexible document and it can hold

anything and everything required to achieve the organization's goals. As stated, it is focused on goals, such as the user's perspective.

Stakeholders	Common terms	Role	Objectives
Commissioner	Byggherre, Client, Financing party	The initiaing party with its main interest in the long term effect or profitability of the project	Long term objective (purpose)
User	Target group, customer, beneficiary	1. Order users of the project's output, or what has been produced by the project	Immediate objective (goal)
Contractor	Implementing party, project manager	Responsible for implemetation as contractual party	Outputs

Figure 4.5. Stakeholders' perspectives (Samset, 2015)

The operational plan describes the day-to-day running of an organization. It charts out a roadmap to achieve the tactical goals within a realistic timeframe. Translated to a project, it focuses on the success criteria of the project management: time, cost and quality.

4.4. Success criteria

The Development Assistance Committee (DAC) from the Organization for Economic Cooperation and Development (OECD) has defined five evaluation criteria for development interventions: efficiency, effectiveness, impact, relevance and sustainability (Chianca, 2008).

Translated to projects, Samset (2010) defined them in the following way:

- Efficiency: the degree to which project outputs have been delivered as planned and in accordance with budget. Whether it could have been done cheaper, more quickly and with better quality.
- Effectiveness: the extent to which the objective has been achieved, that is the first order effect of the project for the users, in the market, in terms of production, etc.

- Impact: all other positive and negative changes and effects of the project, both in the short and the long term.
- Relevance: whether the objectives are aligned with needs and priorities of users and the society.
- Sustainability: whether the positive effects of the project will be sustained after the project has been concluded.

This research is focused on relevance and sustainability because, in the words of Klakegg et al. (2011), these two are the superior criteria in a strategic perspective (fig. 4.6), and failing to fulfil them cannot be compensated by good performance in the other criteria. Therefore, the position is using the owner's perspective, in this case the State, and only taking public projects into consideration.

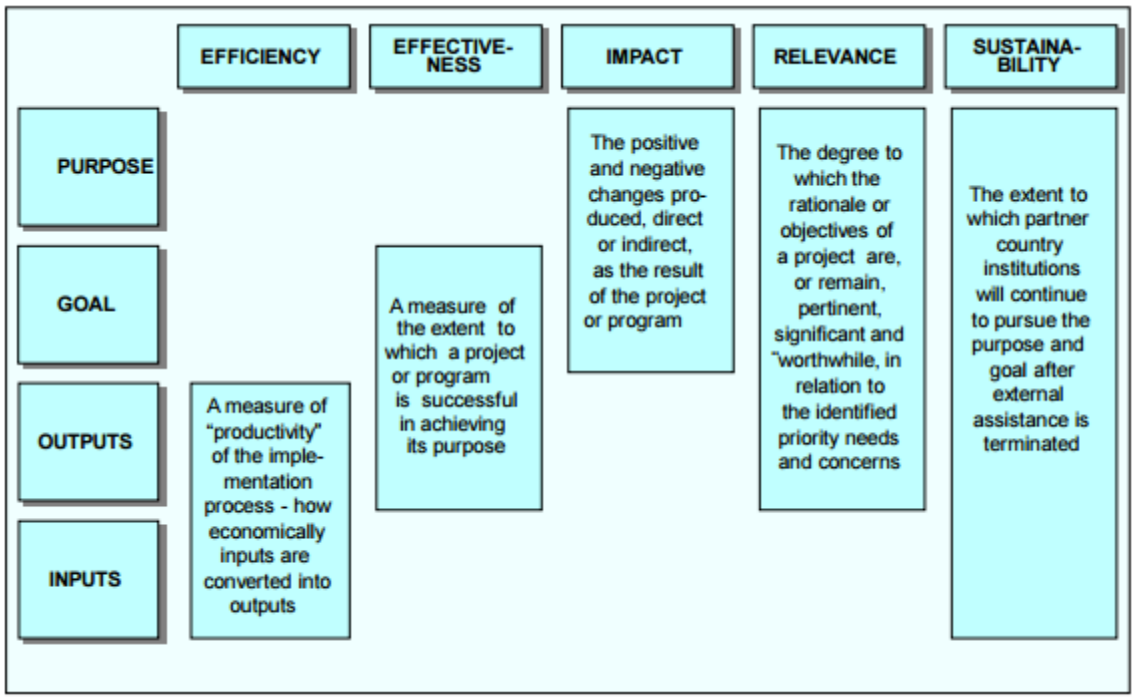

Figure 4.6. Success criteria from the different project perspectives (Samset, 2013)

According to the thesis described by Klakegg et al. (2011), the most important reasons for lack of relevance are: user needs are unknown, misunderstood or ignored, and project objectives are unknown or misunderstood. The most important reasons for lack of sustainability are: lack of commitment to the project from key stakeholders, conflict over objectives and/or strategies concerning the project, low economic and financial benefits compared to operational costs, and business or other conditions changing between concept stage and final delivery.

Success will have to be translated into a hierarchy of indicators that would enable measuring. For example, Samset (2010) mentions that a third level of success indicators, related to relevance, is the compliance with needs and priorities, while one related to sustainability is the future viability of the process.

To achieve proper measuring of the success factors established by the OECD, specifically for relevance and sustainability, Haavaldsen et al. (2012) try to demonstrate how the combination of the Logical Framework Approach (LFA) and the Sustainability Impact Assessment (SIA) provide a platform for defining goals and prediction of important long-term effects of large investment projects.

The LFA is a method for identifying and articulating the objectives of an investment project, as well as assessing risks from different perspectives. The main result from the LFA is the clear identification and justification of purpose and goals. In addition, the procedure helps to:

- Identify information requirements
- Clearly define the key elements of an investment project
- Analyze the investment project's setting at an early stage
- Facilitate communication between all parties involved
- Identify how the success of the investment project should be measured

The LFA fulfills objectives on the three different levels: outputs, goals and purposes, which are directly related to the operational, tactical and strategical levels respectively, as it can be seen in figure 4.7. The LFA is conceived to assure that investment projects correspond to wider societal needs. However, it does not necessarily assure the assessment of impacts beyond the scope of the defined goals and purposes.

OECD (2002) defines sustainability as "the continuation of benefits from a development intervention after major development assistance has been completed. The probability of continued long-term benefits. The resilience to risk of the net benefit flows over time". This definition conforms to the intention of this research, seeing it from the project perspective.

Sustainable Development, as defined by the United Nations (2005), is integrated by three components: economic development, social development and environmental protection. These are commonly known among many authors as the "Three Pillars of Sustainability" (fig. 4.8), and they should be considered in a broad manner. Assuring the sustainability of investment projects is about balancing different perspectives and priorities.

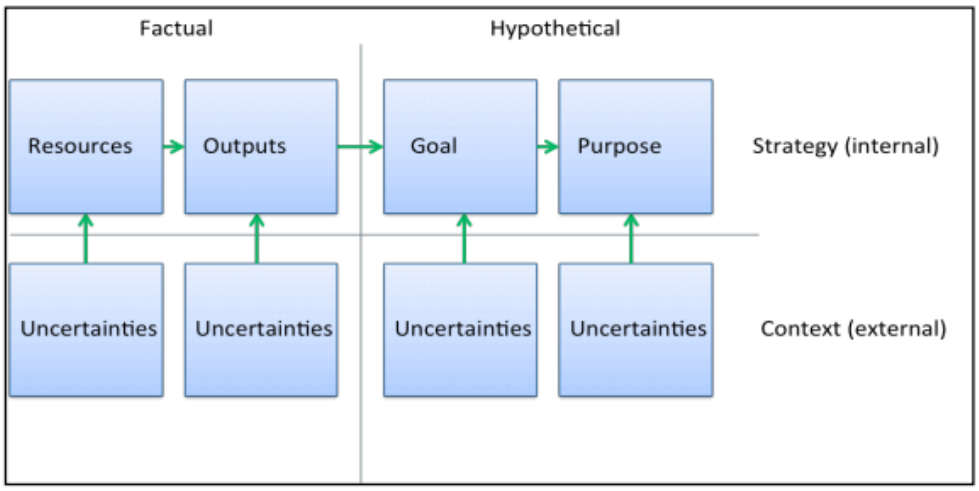

Figure 4.7. Logical Framework Approach (Haavaldsen et al., 2012)

The Sustainability Impact Assessment is a methodological tool that intends to assure the necessary broadness of the perspectives included. The SIA is an approach designed to include a variety of perspectives on an investment project and intends to give a balanced and comprehensive assessment of economic, social and environmental impacts. It is a relatively simple analytical tool and its most significant feature is comparing quantitative and qualitative data (Haavaldsen et al., 2012).

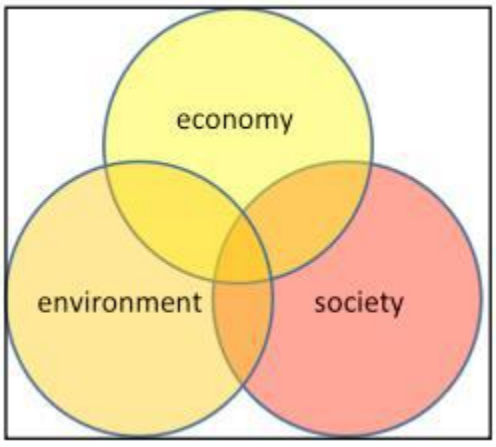

Figure 4.8. The Three Pillars of Sustainability (Haavaldsen et al., 2012)

By using the LFA in conjunction with the SIA, the broader perspective of sustainability can be assessed. The SIA comprehends economy, the society and the environment as interdependent instead of separate entities. The SIA, just as the LFA, is based on a step-by-step procedure, which takes into account some of the steps in the LFA.

The SIA identifies the consequences of a proposed project, but also compares these consequences on the economic, social and environmental level. However, this is not always

easy to achieve, given the fact that the economic consequences can be relatively easy put into monetary values, while the social and environmental consequences cannot be quantified the same way. The comparison, thus, results in both quantitative and qualitative measures.

The spider diagram is being used to sum up this comparison, assigning a weighted score to the different issues assessed and presenting them in a way that makes it easy to figure out which one has a better or worse score, and if one of the pillars is scoring rather badly compared to the others (fig. 4.9).

Nevertheless, the SIA is not intended to provide any final answer to investment project assessment (Lædre et al., 2014). It is considered more of a tool for exposing the most significant impacts of projects, both positive and negative, in order to give a systematic approach to the decision-making process.

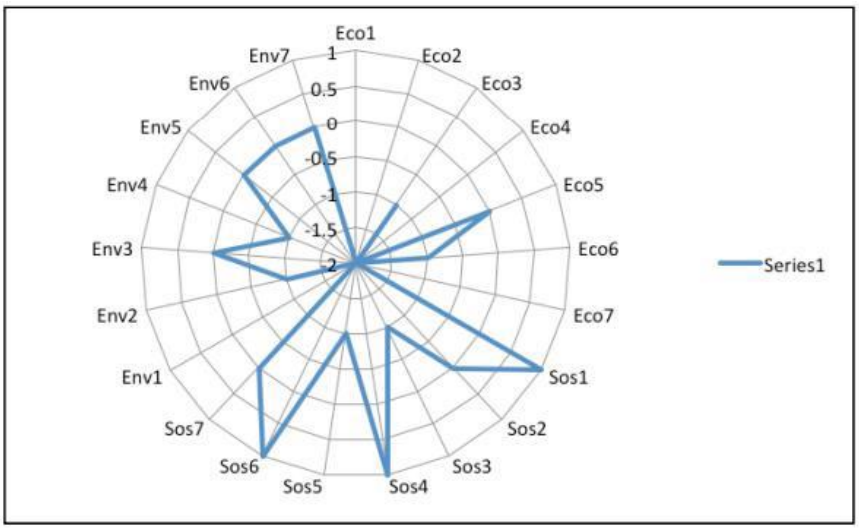

Figure 4.9. Spider diagram of the Sustainability Impact Assessment (Haavaldsen et al., 2012)

5. Examples of State Project Models

5.1. The Norwegian Model

Quality assurance in Norway is external and the Government and the Parliament make decisions at the highest level (fig. 5.1).

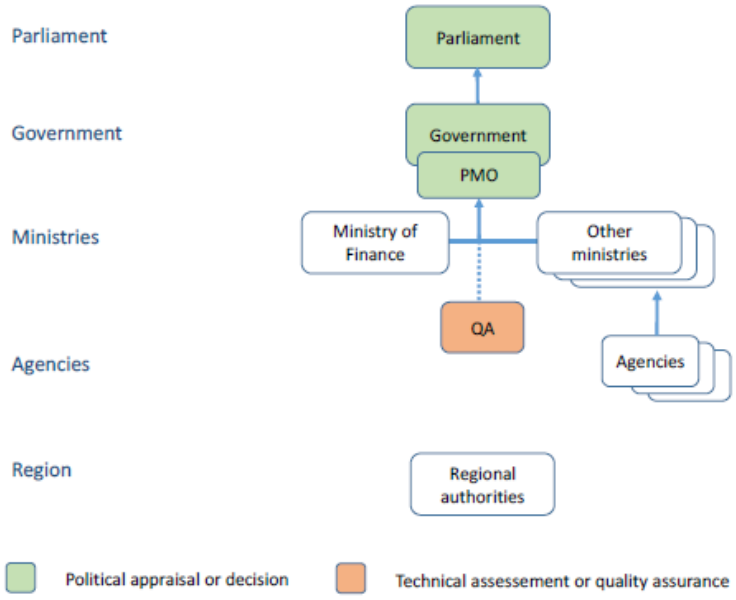

Figure 5.1. Investment Project Governance in Norway (Samset et al., 2016)

The Norwegian scheme, by the definition of Project Model (Samset et al., 2016), is rather simple, with only two decision points with the required document attached, which reflects that it is an overarching model introduced by the wider society. It is important to mention that it only applies to the front-end phase and not the implementation of the project (fig. 5.2).

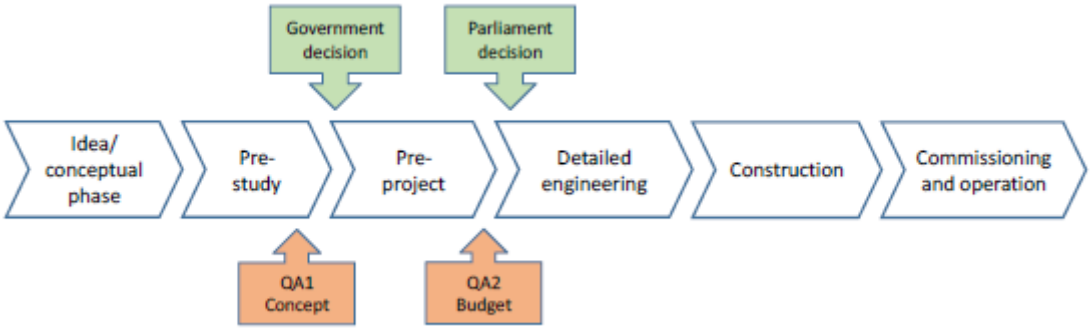

Figure 5.2. The Norwegian State Project Model (Samset et al., 2016)

The Quality Assurance of the Choice of Concept and the Quality Assurance of the Cost Estimate and Management Documentation (QA1 and QA2) are explained in detail by the Concept Research Programme (Samset et al., 2016) and a summary can be found in Appendix C.

5.2. The British Model

The United Kingdom has a scheme of mandatory quality assurance at important gates between project phases, similar to the general project model described in the theory chapters. There is a joint ownership of the scheme between HM Treasury and the Cabinet Office (the Ministry of Finance and the UK Office of the Prime Minister) (fig. 5.3). The Infrastructure and Projects Authority (IPA) manage the scheme.

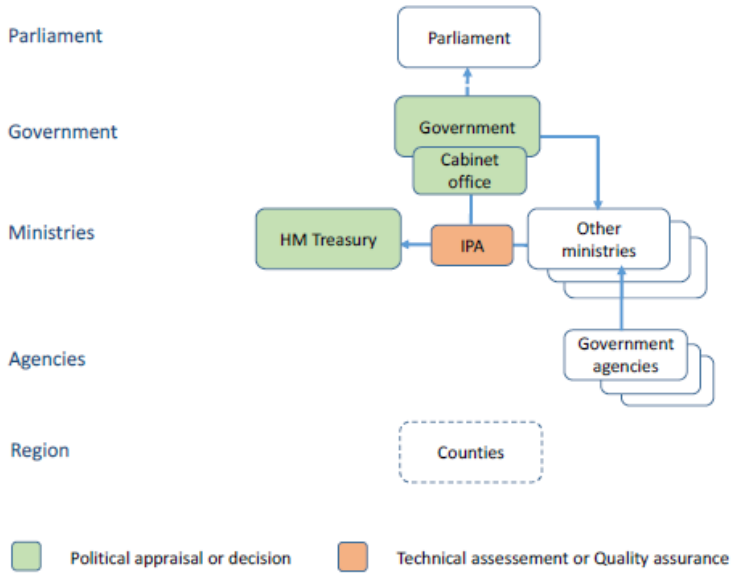

Figure 5.3. Public Investment Project Parties and Roles in the UK (Samset et al., 2016)

The project governance scheme for the United Kingdom is based on the stage-gate model, this time with four phases: policy formulation, project initiation, implementation, and commissioning and operation. Figure 5.4 illustrates it, with the IPA's quality assurance at the bottom and HM Treasury's approval at the top.

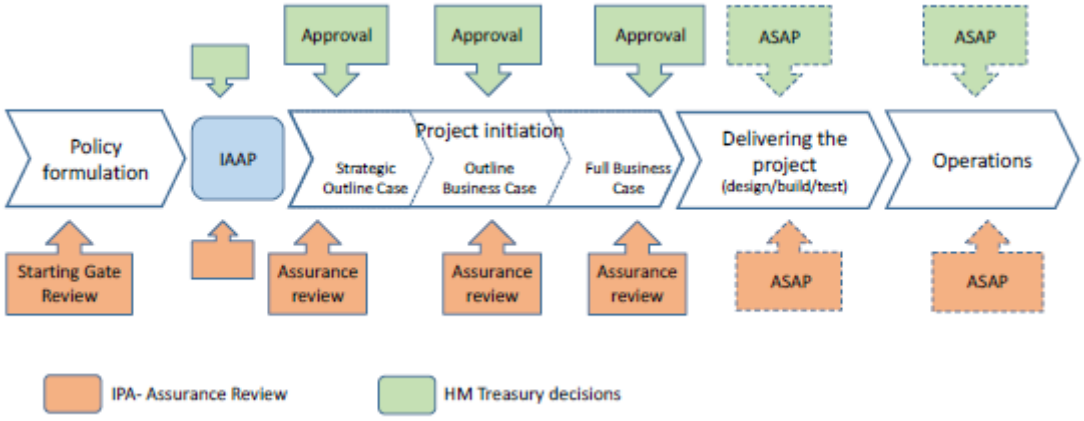

Figure 5.4. The Stage-Gate Model in the UK (Samset et al., 2016)

The main elements of the scheme are the Starting Gate, the Integrated Assurance and Approval Plan (IAAP) and the Business Case. A more thorough explanation of these elements, and the scheme as a whole, is found in Appendix D.

5.3. The Costa Rican Model

The quality assurance scheme implemented in Costa Rica follows initially a rather simple approach (fig. 5.5), where the different institutions within the government, based on their interests, propose their own projects. The Institutional Planning Units (UPI) of every institution handle this process and later register the project in the Bank of Public Investment Projects (BPIP) (Appendix H), which is controlled by the Ministry of Planning (MIDEPLAN). After MIDEPLAN has checked and approved all the requirements needed for the registration of the project, the request for financing can be started. This represents a more complex process and, therefore, will be more thoroughly covered in chapter 7.

The scheme also follows a stage-gate decision approach like the Norwegian or the British schemes, and the project model proposed by Samset et al. (2013), but unlike these, there are several possible scenarios depending on two factors: the registration of projects into the BPIP can be made on different stages of the project, namely Profile, Pre-feasibility and Feasibility. Furthermore, there are different parties involved in the financing of the projects depending on the type of institution proposing the project (Central Government or decentralized institution) and the type of financing required (debt or own resources). This is also explained in more detail on chapter 7, with the different forms of project financing in Costa Rica.

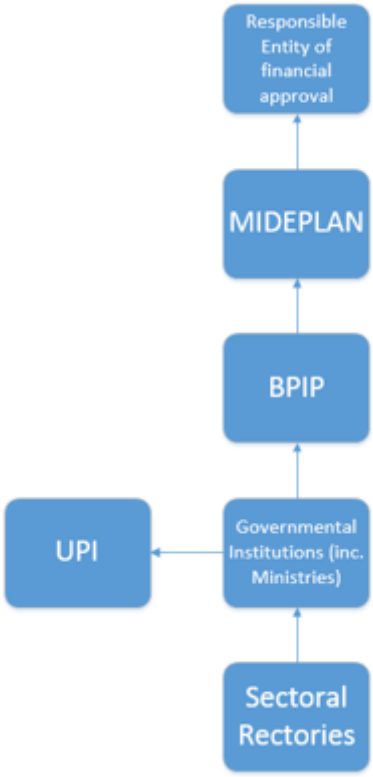

Figure 5.5. Public Investment Projects Governance in Costa Rica

5.4. Key components in the Norwegian, British and Costa Rican schemes

Table 5-1 shows the main characteristics of the quality assurance schemes in Norway, United Kingdom and Costa Rica. The results presented in this table are addressed in the discussion chapter.

Table 5-1. Differences and similarities between the Norwegian, British and Costa Rican State Project Models

Criteria	Norway	United Kingdom	Costa Rica
Responsible of starting the process	Ministry of Finance	Agency under the Cabinet Office	Institutions within the Government
Decision on the budget	Parliament	Treasury	Depending on the financing system
Sectors included	All, with some exceptions	All sectors	All, with some exceptions
Threshold value	750 million kroner	Those projects considered "large"	No
Performer of quality assurance	External consultants	Independent quality assurance	Ministry of Planning and Ministry of Finance or CGR
Approval in every stage	No	Yes	No
Parliament or Congress involved in decision making	Yes	On exceptional projects	Depending on the financing system
Consideration of alternatives (including zero-alt)	Yes	Yes	Yes
Approval by the Ministry of Finance	Yes	Yes	Depending on the financing system

6. Criteria for the choice of concept in Costa Rica

During the choice of the conceptual solution (Haavaldsen et al., 2012), the basic and precise information about the problem to solve by the project is gathered. Therefore, it is required to identify the causes and effects of it, define and compare different alternatives of solution, define the expected objectives and results, as well as the linkage with the policies, plans and strategies of development (MIDEPLAN, 2012a).

Furthermore, the technical characteristics of the project are presented, including the different required analyses: market, technical, reduction of risk to disasters, environmental, legal and administrative aspects, which shall be considered as part of the pre-investment for its execution and evaluation (MIDEPLAN, 2012a).

Table 6-1. Criteria for the choice of concept of public investment projects in Costa Rica

Type of Analysis	Aspects considered
Identification	Problem identified, Optimization of zero alternative, Alternatives, Project objectives, Expected results, Adjustment to development plans, Influence area, Beneficiaries
Market	Market conceptualization, Characteristics of goods and services, Objective population, Demand and supply estimation, Prices and rates analysis, Commercialization channels, Information and divulgation strategies
Technical	Geographic location, Size, Technologies, Engineering, Opinion of the community about the technical proposal, Social responsibility
Disaster risk	Siting of the location, Vulnerabilities identification, Quantification of risk to disasters, Risk reduction alternatives, Cost and benefits from mitigation of risks
Environmental	Evaluation of environmental impact, Corrective/compensatory measures and their costs
Legal	Adjustment to current legal norms, Characteristics of the legal framework
Administrative	Organization and administrative structure, Planning and programming of the execution, Evaluation of institutional risks

The following sections are based on the guidelines published by the Ministry of Planning (MIDEPLAN, 2012a). A more thorough summary of the guidelines can be found on Appendix F.

6.1. Identification of the project

The background of the project refers to the precise description of:

- The motives that have generated the problem.
- The explanation of why is it responsibility of the Government to solve such problem.
- The previous initiatives proposed with similar purposes.

The problem should be described as a negative situation that affects a sector of the population and can be deducted as part of the problem trying to be solved. Once the problem is defined, the causes and effects must be identified.

An important part of the analysis is the optimization of the base situation, in which it is defined if it is possible to obtain improvements without carrying out a project from scratch, or identifying low cost measures that can improve the current situation, eliminating, totally or partially, the idea of a new project.

After clearly identifying the causes and effects of the problem, it becomes easier to explain the reasons why it is necessary to execute the project, which leads to define different alternatives of solution to the problem, with the purpose of selecting the best option by considering all of them with their advantages and disadvantages.

The first alternative to evaluate is the optimization of the base situation, and then the rest that were identified, to determine viability of them and to discard those who are not feasible for different reasons, whether technical, financial, economic, legal, environmental or any other.

The general and the specific objectives must be in accordance with the problem pretended to solve and the availability of resources. The general objective comes from the selected alternative for attending the problem, and it should describe the purpose expected to reach with the execution of the project. The specific objectives are related with the execution and operation of the project, and they should be quantifiable, attainable, concise and derived from the general objective.

The expected results express the achievements of the project in quality and quantity, and they are built from each of the specific objectives. They must be tangible, verifiable, quantifiable and feasible in a determined period, to evaluate progress of the project.

The project must also be linked to the guidelines of national, sectoral, regional and local policies, such as its relationship with other plans, programs and projects implemented in the area of influence of the project. The integration of the project with the PND and the PNIP must be specified.

Determining the area of influence consists in delimiting the geographic space of the project, where the problem affects directly and indirectly the population and where the selected alternative is planned to be implemented. It is important to consider the following elements to define the area of influence:

- Geographic limits
- Socioeconomic conditions of the affected population
- Accessibility conditions

The project beneficiaries will be identified and described using an indicator or a measure unit, specifying in quantitative terms the socioeconomic conditions of the area of influence.

6.2. Market Analysis

The purpose of the market analysis is to measure the quantity and quality of the goods and services required to solve a determined need, simplifying the decision-making and reducing the associated risks. It implies quantifying the number of people who will demand a good or service that justifies the project's execution, determining the offer, as well as prices and rates to which they will be offered. The quality of the market analysis is determinant for the success or failure of a project.

In the market analysis, the main demographic, geographic, economic, social, cultural and institutional characteristics around the project must be analyzed, related to the behavior of the users or beneficiaries. The goal is to identify the needs, preferences and customs of the consumers, related to the environment, so this can adapt into attending the users.

The problem representing the conception of the project initially allows to identify the good or service wished to be produced, but it is needed to define it with the greatest precision possible, identifying its nature and characteristics. Therefore, the main substitute and complementary products (goods and services) must be taken into consideration.

After having the problem or need determined, it is needed to identify, characterize and quantify the current affected population, estimate its evolution on the coming years and define, quantitatively and qualitatively, the necessary goods and services to attend it, and this represents the first step to get to know the demand.

There are two types of population: the affected and the objective. The first one is the one that requires the services of the project to satisfy the lacking need; it can also be called lacking

population. The objective population is the one that will be affected - positively - directly by the project. The characteristics of the latter shall be determined: nature, quantity, age and gender, customs, location. The ideal scenario is when the project can cover all the needs of the affected population, but for different reasons that cannot always be the case. Therefore, feasibility and priority criteria should be applied to optimize the resources and reach the maximum possible. The percentage of the population that cannot be attended will become an unsatisfied demand, and should be included in posterior projects.

The demand analysis of the good or service of a project consists on estimating, based on historical and current perspective, the quantity demanded by the consumers, to then estimate the future behavior, considering variables that could modify the tendency and demonstrate if the project is justified. The offer analysis is done in a similar way to the demand analysis, identifying the historical offer and determining the current and future offer.

After the demand and the offer have been estimated, the comparison between them will have thus the possibility to estimate the potential unsatisfied demand of the project.

The prices of goods and services depend on the nature, characteristics and magnitude of the project. It is necessary to know the historic tendency of the variation of these prices and its future projections. If the projects finance their production based on the rates of public services, they should be analyzed taking into consideration the rate structure and its impact on future demand. If there is no charge for the service, an analysis of unit cost per served person must be made.

The project should describe the marketing channels for the users to receive the goods or services developed by the project. These are the organizational relationships that allow to put the product between the producers, intermediaries and final users.

According to their nature, the projects need to consider and define their information and divulgation strategies to the objective population about the goods and services to be offered. The information about all the benefits is required to reach all the users.

6.3. Technical Analysis

The technical study allows to propose and analyze different technological options to produce the required good or service, verifying technical feasibility of each of them. Equipment,

machinery and installations need to be identified, as well as size, technology, localization and engineering available.

The localization study has the goal of selecting the most convenient location for the project, starting from the area of influence, and selecting the alternative that produces the greatest benefit for the users and the community and constitutes the lowest social cost. There are, of course, many limitations which need to be considered to make the right decision: location of the consumers and facilities (electricity or water, for example), availability of resources, financial restrictions, land availability, environmental restrictions or risks.

The project should be subdivided into categories or thematic grouping. Each of these categories are closely related to improving the organization and easing the project execution. These components are translated into a schedule that relates activities with time and resources.

The size of the project depends on the kind of action desired to take, which is defined by the capacity of production on a given period. The most adequate measure is the quantity of the product by unit of time. When it is a service-oriented project, the served population, the attended people or the characteristics of the geographic area of influence will define the size.

The analysis of technology has to consider and select different alternatives of means and procedures, as well as evaluate benefits and consequences of choosing one or another technological approach. The technology of a project can be expressed as a function of the characteristics of the users, input availability, production process of goods and services, required human resources, necessary equipment, environmental impact, social effects, etcetera. The selection of technology must be justified.

The project engineering is a complementary aspect to the technological one, and some points that must be included are:

- A distribution of the main activities that constitute the engineering of the project, describing the phases of execution of each component and the required input.
- The distribution of the physical space required for the operation and functioning of the project.
- Technical specifications that must be attended during the execution and operation of the project.
- Security and special requirements, which include designs that incorporate acceptable hygienic conditions and the use for people with disabilities.

It becomes fundamental to know and value the population criteria regarding the technical proposal of the project, to enhance the capabilities and support to the implementation of it, with the goal of designing solutions that can answer to the values, customs, uses and preferences of the people benefitted by the project.

The Project Executing Unit must implement certain measures that guarantee a project management that contemplates all the interest groups, taking responsibility of the consequences and impacts derived from the project, in an exercise of social responsibility to the community.

6.4. Disaster Risk Analysis

This analysis has the goal of identifying the risk to disasters, facing possible threats and vulnerabilities, as well as the establishment of mitigation measures that must be assumed to reduce the risk and guarantee security, quality and sustainability of the investment in time and space, to obtain the goods and services planned with the execution of the project.

The threats of risk to disasters are classified in natural, socio-natural and endogenous (technological or complex). The process of identification of events to threats becomes easier when the causes and effects originating the project are considered. The siting of the location makes the analysis of current threats and potential risks easier, which is identifying possible dangers, events or phenomena with the possibility to provoke a disaster, starting from the selected location site and considering the area of influence.

The siting of the location gives the conditions to identify vulnerabilities of the project, which can be classified into degrees of exposure, fragility and the capacity of being resilient. These three factors are related and focused on prospective management, corrective management and reactive management.

The quantification of risk to disasters needs to be done, which is the evaluation of possible losses and damages that the project could be faced with, because of the existent vulnerabilities when the threat or danger materializes. These probabilities are related to human or material losses, infrastructure, the environment, among others.

The consideration of alternatives or measures for reduction of risk to disasters consists in the establishment of alternatives of prospective, corrective and reactive management to consider the degree of exposure and fragility. It also aims to increase the resilience of the project, starting from the identification of current and potential threats according to the siting of the location

and the risk factors that the project generates, with the goal of improving quality, security and life cycle. Each alternative must be submitted to a process of technical and cost analysis to achieve an easier decision-making process. This mitigation measures are included into the investment and operation costs, which are fundamental to guarantee its sustainability.

According to the established alternatives, each of them will be quantified, and they will be considered, along with the other inputs, to elaborate the cash flow to perform financial, cost and socioeconomic evaluations.

6.5. Environmental Analysis

During the process of analysis and evaluation of environmental impact, the institutions need to identify the impacts that the project could generate on the environment, as well as the intervention measures that these impacts would require, along with their costs, which shall be submitted to financial, cost and socioeconomic evaluation. This allows to minimize mistakes on cost estimation when the alternatives are being chosen, guaranteeing harmonization of the project with the protection of natural resources.

The methodology to identify and assess the impacts is indicated in Executive Order 32966-MINAE, where the Relevance of Environmental Impact Matrix (MIIA) is established, which is a clear summary of the effects of the projects and their significance. The Environmental National Technical Secretary (SETENA) gives the potential environmental viability (VAP) of the project during the pre-investment phase, and the studies must have the following information:

- If the project is on the profile phase, it must be categorized according to its Potential Environmental Impact (IAP) and, in case the project requires only the profile for its execution, it must present the environmental viability approved by SETENA.
- If the project is on the pre-feasibility phase, the required studies must be completed to fulfill the form to present to SETENA, which will analyze and evaluate it, to finally give a classification of Significance of Environmental Impact.
- If the project is on the feasibility phase, the documents must be submitted, where SETENA will give a conclusion on whether it accepts or not the environmental viability of the project.

The effects of environmental impacts can be positive or negative, direct or indirect, accumulative or not, reversible or irreversible, extensive or limited, among other characteristics. Environmental impacts differentiate from damages in that the former are evaluated in an ex ante process, in a way that prevention, mitigation and compensation aspects can be considered to diminish the reaching into the environment. The potentially impacting activities should be identified for the periods of construction, operation and end of life cycle. The impacts are assessed in term of their importance, which considers nature, extension, persistency, synergy, effect, recoverability, intensity, moment, reversibility, accumulation and periodicity.

Once the impacts are assessed, the intervention measures to be implemented should be determined, and they can be:

- Protective measures which avoid the appearance of the effect.
- Corrective measures of recoverable impacts, directed to annul, attenuate, correct or modify the actions and effects of productive processes, operation conditions, factors of the environment as a receptive agent and other parameters.
- Compensatory measures of irrecoverable and unavoidable impacts, which can compensate in a certain way the alteration of the factor (license for polluting, creation of other green areas).

The cost estimation of the intervention measures is performed according to the requirements of the environment. The investment has to consider all the costs of modifications and complementary works, as well as the costs in the operation and end of life cycle phases.

6.6. Legal and Administrative Analysis

These studies indicate the planning and programming of the project execution and the ideal organization that responds to the existent legal framework to carry out the project and it is applied during its execution and operation.

The project must be in accordance to the valid legal regulations and the characteristics of the legal framework related to the implementation of the project. This analysis is done to avoid future legal problems that prevent the execution of the activities.

There should also be an administrative structure, which indicates the degree of responsibility of each participant, making a summary of what it implies to execute the project, design the basic organizational structure and locate the managerial responsibility.

The process of planning and programming shall also be included, in which the activities required by each component of the project are defined according to its objectives. This should be a list of the activities and their sequence, which leads to the allocation of human resources, time and cost for each of them.

The institutional risks of the project need to be considered according to the Specific System of Assessment of Institutional Risk (SEVRI), which contemplate the following aspects:

- Identification and assessment of the main processes of the project.
- Establish the procedures for each of them.
- Evaluate the procedures according to the risk portfolio.
- Define the magnitude of the risks and the attention priority to the critical activities.
- Incorporate solution alternatives and the cost estimation associated to the implementation of the activities related to the SEVRI, which should be reflected in the costs, income and benefits.

7. Financing projects in Costa Rica

Figure 7.1 shows the different forms of financing projects in Costa Rica, depending on the type of institution responsible for the project or if the project requires financing through external loans, which leads to public debt. It can be summed up in three different scenarios, colored in orange. The first two options do not require debt, while the third scenario, with two different options, does.

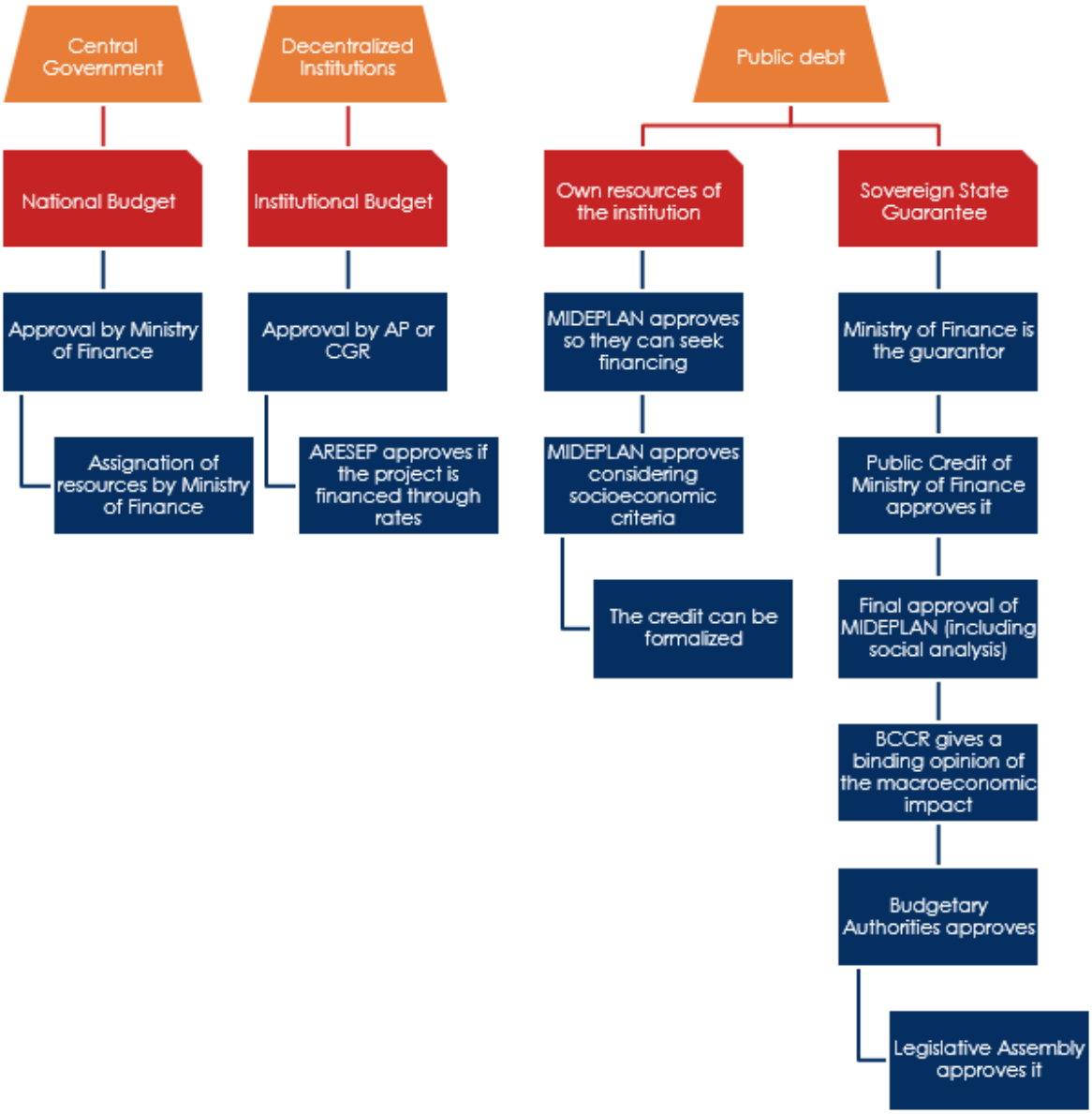

Figure 7.1. Different forms of financing public investment projects in Costa Rica, depending on the institution and the possible requirement of debt

The author, based on the results from the interviews with senior public officials at the Ministry of Planning (Intv. 1, App. I) and the Ministry of Finance (Intv. 6, App. I), created this diagram of the different scenarios of financing public investment projects, and its description and explanation. The results here presented are spread out through the laws and regulations surrounding investment projects, national budget and the own institutions, which made it unmanageable to summarize in this way. Therefore, the interviews proved to be helpful to construct the forms of financing projects.

When the project is for the Central Government, namely the ministries, and it does not require debt, then the project is financed by the National Budget. This share of the budget is responsibility of the Ministry of Finance; therefore, this is the institution in charge of approving the investment projects' budget. It is important to mention that the budget is not given to a specific project. Instead, the Ministry of Finance allocates funds to the ministries based on the proposed projects and the necessities raised. In other words, the Ministry of Finance does not prioritize projects, it prioritizes spending limits, and the institutions are the ones that prioritize their own projects according to those limits. The projects should be formulated according to the guidelines given by the Ministry of Finance (Ministerio de Hacienda, 2017), which requires to consider the guidelines published by the Ministry of Planning (MIDEPLAN, 2012a).

If the project is included into a decentralized or autonomous institution, then the responsibility of the budget lies upon the General Comptroller (CGR) or the Budgetary Authorities (AP), depending on the type of institution. Even further, if the project is going to be financed through rates, the Regulatory Authority for Public Services (ARESEP) has to determine them and approve the feasibility of the project by this mean. Examples of this kind of projects are water-related projects, executed by AyA (see Appendix G), in which the rates are reflected in the water bill that the population will pay every month.

The third scenario is the one where public debt is required. There are two kinds of debt, the one that can be paid with the institution's own resources and the one where the State incurs the debt and must respond for it, independent of the outcome.

When the debt is going to be financed by the institution's own resources, MIDEPLAN first needs to give an endorsement for the institution to look for, negotiate and define the loan conditions with the financing entity. After establishing the financial conditions, MIDEPLAN gives their final approval, in which the credit is formalized and a report is emitted. This approval considers the financial evaluation as well as the socioeconomic evaluation (MIDEPLAN,

2012a). If all the requirements are met and the evaluations present positive results, the final approval is given and the project can start.

The second and most complex option happens when the State needs to take over the debt. This mainly happens for institutions within the Central Government or large projects for other institutions. The first step consists in requesting the start of negotiations. This qualifies the Ministry of Finance as the guarantor of the loan as a representative for the State. MIDEPLAN approves the registration into the BPIP, which follows the endorsement by the Department of Public Credit of the Ministry of Finance, which reviews the financial issues related to the loan. The Ministry of Planning gives their final approval, including the socioeconomic analysis, before sending the documentation to the Central Bank (BCCR), which issues a binding opinion on the macroeconomic impact of the project. The Budgetary Authorities, the collegiate body composed by the Minister of Finance, the Minister of Planning, the CEO of the BCCR and a representative of the Ministry of Presidency, endorses the debt in a definitive phase. The final step includes the approval of the Legislative Assembly, also known as Congress, in which the 57 deputies, a.k.a. congressmen, vote to decide if the project pertains the identified necessities and adjusts to the PND. In other words, they vote to decide if the project is going to be executed or not. After the Legislative Assembly approves the debt, the project can enter the implementation phase.

Projects can be inscribed into the BPIP in three different phases: Profile, Pre-feasibility and Feasibility. When they are inscribed into the profile phase, the institutions are looking for resources to perform the feasibility studies for the project. Inscribing projects into later phases means that those studies have been done, whether hiring external parties or by their own engineering offices, and the execution phase is planned to start in the near future. The resources for these projects will be sought to begin the execution.

7.1. Budget into the Ministry of Finance

The public budget is proposed and approved annually and, as mentioned before, comes with a spending limit. This also means that the expenses from the previous year, which will not be used, are going to be removed to the current year's budget. Depending on the country's financial status, the institutions will receive less or more financial resources for developing their projects than the previous year.

There have been many cases where the financial resources are not enough for the projects they have planned for, so the institutions ask for an extra-limit budget. When approving these kinds of budgets, the Minister of Finance, responsible for taking this decision, performs an analysis that is practically only based on the economic situation. This way, projects which are socially beneficial, but do not have an economic profitability, will almost never be prioritized. The main criteria used by the Minister of Finance to make these decisions are having healthy finances, keeping control of the country's deficit and not having an overinflated budget.

The Minister of Finance presents the national budget to the Legislative Assembly, according to all necessary considerations and studies, and they approve it. Even when the Legislative Assembly has a final saying on the national budget, rarely will it not be approved. This will only happen on very exceptional cases.

The Ministry of Finance, through the Legislative Assembly, is responsible of only the 34% of the national budget, while the General Comptroller is responsible for the other 66%. This way of handling the public budget has raised attention over the world because of its uncommonness (Intv. 6, App. I). It is important to mention that the 66% of the budget allocated by the CGR is not public knowledge, which is not the most transparent way of doing it. Furthermore, the CGR does not handle the budget in such a detailed way as the Ministry of Finance does (Intv. 6, App. I).

There are guidelines to formulate public investment projects (Ministerio de Hacienda, 2017), which include the requirement of following the guidelines established by MIDEPLAN (2009, 2012a) (App. E). These guidelines also encourage a new system established in CR called Management for Results in Development (MIDEPLAN et al., 2016), which pertains those results that come to attend a national problem. For the specific case of an investment project, it will solve the problem, which will have as a result the development of the country.

8. Current problems found in the Costa Rican scheme

This chapter presents the findings gathered on the interviews with the senior public officials responsible for handling the scheme in different governmental institutions, in which several problems have been identified. Each problem is mentioned and described, and then classified in different categories, to be later addressed in the discussion chapter.

8.1. Current problems

1. Sectoral and regional secretaries are not fulfilling their role:

Sectoral and Regional Secretaries of every institution should be the departments identifying problems and needs and proposing investment projects. This is currently not happening and the responsibility lies completely upon the head of institutions. The capacity of the UPI is not big enough to handle all this work, therefore not all needs are identified or prioritized.

2. Digital system for inscribing projects into the BPIP is not working yet:

As of January 2017, the digital system to register projects into the BPIP (Delfos) (see Appendix E) is not working properly. Most of the public officials interviewed stated that they have had problems with the digitalization process and ended up having to register the projects "by hand" as it has always been.

3. MIDEPLAN is not responsible for the budgetary decisions:

The Ministry of Planning is responsible for the quality assurance scheme, in which financial aspects are considered, but has no influence in the budgetary decisions. Institutions carry out their identification and formulation of projects with the guidelines published by MIDEPLAN, but there is no direct link to the budgetary issues. They have to seek out financing for their projects on a different institution, as seen in Chapter 7.

4. Lack of ex-post evaluations:

Ex-post evaluations have not been yet implemented for public investment projects in Costa Rica. It is on the agenda of the Ministry of Planning, but there is still no capacity to carry out

these evaluations. The personnel have not been trained for this task and there are no human resources available.

5. Low emphasis on social profitability measures:

The main reason to formulate a project keeps being the economic profitability it may have. There are several projects, which have a great positive social impact, but since they cannot offer enough profit, are not prioritized by the authorities.

6. Projects implemented due to political interests:

Political interests and pressure groups still have an important role when it comes to selecting a project. It is widely known that some projects will represent a benefit, translated into votes, to political parties. The problem arises when these projects are not aligned with the country's strategy, even worse when they do not even have an economic profit.

7. Scheme not always followed by the institutions:

Not all governmental institutions follow the scheme for every project they have. Unfortunately, they do it when it is convenient for them, especially when they need the project to be financed by the State. Another example comes when the institutions ask for resources directly to the financing entities, and since the request is well founded, those resources are still given, even when the institution did not follow the guidelines established by MIDEPLAN.

8. No public investment law:

The scheme has been implemented recently, and a public investment law has not yet been created. This situation opens the possibility for institutions to not follow the guidelines established, resulting in the cases seen in point 7. Not having a public investment law undermines the authority of the Ministry of Planning as the responsible for the state project model.

9. Low-qualified personnel:

Having been established recently, there are few competent people, both with experience and education, who can handle the scheme properly. The personnel are being trained progressively, but there is still a long way to go. In addition, it is borderline impossible to fire someone, despite their inefficiency, because they have property of the position.

10. No definition on projects entering the scheme:

Associated with the absence of a public investment law and the loopholes available for officials to avoid employing resources in adjusting properly to the scheme, there is no definition on which kind of projects are required to enter the scheme. There is no threshold for project budget or definition on which projects are considered large.

11. Lack of execution capacity:

In addition to the personnel not being qualified, the institutions are not ready to execute their own projects. This results in constant delays and idle resources. From the front-end point of view, this translates into an absence of emphasis around feasibility studies, leaving them to further stages.

12. No project portfolio on a country level:

Even when the BPIP aims to gather all projects, there is no project portfolio on a country level. The projects in the BPIP are all analyzed separately depending on the institution and the kind of financing. Therefore, they are not analyzed as a global strategic plan, which pertains to the whole country, and priority projects cannot be identified.

13. Financing agreed upon before feasibility studies:

Many projects, whether it is because of international cooperation agreements or unorganized planning, have the financial resources long before any feasibility study has been made. The implementation phase (Samset, 2015), then, will start several months, or even years, after the funding has been received. The result will be great cost overruns because of the change in cost of materials, inflation, exchange rate, minimum wage, among others.

14. Front-end phase not being prioritized:

There is still some resistance against accepting the importance of front-end management (Samset, 2015) in public investment projects. The majority of resources and focus is given to the implementation phase, in which any change made results in considerable cost overruns. The way of thinking keeps being that it is too expensive to perform feasibility studies before the implementation phase. This also includes delays on the project, which tend to create a discomfort on the citizens.

15. PND renovated every 4 years:

The National Plan for Development (PND) is, supposedly, the long-term strategy for achieving precisely development for the country. A large part of this document includes public investment

policies, of course. The downside of this so-called strategy is that it is renovated every four years, with the change of government. It does not necessarily represent a big problem if the same vision is followed, but there is no guarantee on that.

16. International cooperation has big influence on projects:

A large percentage of public investment projects in Costa Rica are being executed because of the cooperation the country has with another States from different parts of the world, especially large projects. The governments of these countries practically decide the specific project they are going to finance, but there is no guarantee that the project will be aligned with the PND.

When a project is financed, or even donated, by an international government or entity, it immediately becomes a priority, given the fact that it needs to be completed and put into operation. Since they need to receive funding, other projects that may be in accordance with the development strategy can no longer be financed. These projects are the ones which are approved faster because they already have a financing with a loan that comes from international agreements. The political interests over these projects are very high.

17. Responsibility of the scheme on the institutions:

The responsibility of properly carrying out the quality assurance scheme lies completely upon the institution pertaining to the project. In other words, there is no external evaluation, which can lead to the choice of wrong projects, being influenced by political pressure or simply by an incorrect way of managing the front-end phase.

18. No direct communication between Ministry of Planning and Ministry of Finance:

The Ministry of Planning and the Ministry of Finance do not have direct communication when it comes to the scheme, which leads to duplicity of functions, as well as inhomogeneity developing those functions. Simply put, the way processes are handled in one institution are not in accordance to the way they are done in the other. Even when the guidelines of MIDEPLAN (2012a) are required when requesting financial resources to the Ministry of Finance, they do not check if the project has already been approved by MIDEPLAN. To sum up, it needs to be done but nobody checks if it has been done. As mentioned before, it is complete responsibility of each institution.

19. Unreal budget on change-of-government years:

The budget requested by the institutions on the years that the government changes is unreal, because the political decisions will depend entirely on which party wins the elections and, for example, each Minister is chosen by the elected President. During these years, the only real part of the budget is the one pertaining to projects which have already started.

20. Recommendations from LANAMME are not binding:

The National Laboratory of Structural Materials and Models (LANAMME) constantly gives recommendation about structural issues regarding public projects. Unfortunately, these studies are not binding and several times have been disregarded, resulting in low quality infrastructure projects, mainly roads and bridges, which have had the necessity of constant maintenance and/or reconstruction. In addition, most of these studies are not done during the front-end phase, but during the implementation phase, when changes represent a higher cost.

21. Low accountability for bad decisions:

It is difficult to find people responsible for bad decisions. Over time, several projects have turned out to be a failure, but the heads of department are not held accountable (OECD, 2002) for those decisions. Those top positions are either political or in property, which makes it difficult for someone to "pay for their mistakes".

22. Environmental decisions taken too late:

The guidelines published by MIDEPLAN are clear about the considerations to be taken regarding environmental issues (Section 6.5). Nevertheless, this is a step that is often at least partially skipped. The projects are approved and receive financing, even after surpassing the stages of MIDEPLAN and the Legislative Assembly, but the real studies regarding the environment come after the beginning of the implementation phase. At this point, SETENA has to intervene and stop execution until a new problem found is solved. This, of course, does not happen to every project, but when it occurs, the project may end up being stopped indefinitely, with the possibility of never being retaken again.

23. Unstandardized processes to identify priority projects:

Some institutions have an unorganized process to identify their priority projects, since requirements are not established, and they respond only to internal regulations. Even when there is no standard from MIDEPLAN, some of the UPI have responded to this by showing their efforts to improve their processes, and classifying their projects by categories, considering the socioeconomic situation and not only the financial issues. In addition, project formulation, also

referred as choice of concept, is becoming more important than the execution, but still at a very slow rate.

MIDEPLAN should publish a guideline concerning prioritization of projects that the institutions can follow and standardize the process.

24. Updating the status of the project on the BPIP has become just a formality:

Annually, the status of the projects must be updated on the BPIP. This update has turned out being just a formality, since it is only responsibility of the institution to do it, and there is no check from the Ministry of Planning. In the end, resources are being spent on a process nobody is benefitting from.

25. The budget is revised annually:

The national budget is approved annually, but there is still a lack of long-term vision. Multiannual budgets are only beginning to be implemented. This situation, in addition to the changes in the PND, can create a short-term strategic vision on public investment projects, drifting away from addressing the country's real needs.

8.2. Problem classification

The problems found and mentioned in the previous section can be classified in three different categories:

- Problems related to the choice of concept
- Problems related to the forms of financing
- Other types of problems

The reason this classification was chosen was to address the research questions proposed in the Introduction chapter. This way, the problems are separated in the ones related to the choice of concept and the ones regarding financial issues. There are some other problems that cannot be classified in these two categories, so they were just named as "other problems".

8.2.1. Problems related to the choice of concept

The choice of concept has the most issues, according to the interviews conducted with senior public officials in Costa Rica. This situation directly affects the projects chosen to be

implemented, which is seen as a worse scenario, meaning that the right projects are not the ones being chosen.

- Sectoral and regional secretaries are not fulfilling their role
- Low emphasis on social profitability measures
- Projects implemented due to political interests
- Low-qualified personnel
- No definition on projects entering the scheme
- No project portfolio on a country level
- Front-end phase not being prioritized
- PND renovated every 4 years
- Responsibility of the scheme on the institutions
- Recommendations from LANAMME are not binding
- Environmental decisions taken too late
- Unstandardized processes to identify priority projects

8.2.2. Problems related to the forms of financing

The financial issues represent a number substantially lower than the ones related to the choice of concept. However, this may have to do with the fact that only one public official from one of the institutions responsible for the financial decisions, the Ministry of Finance, was interviewed.

- MIDEPLAN is not responsible for the budgetary decisions
- Financing agreed upon before feasibility studies
- International cooperation has big influence on projects
- Unreal budget on change-of-government years
- The budget is revised annually

8.2.3. Other types of problems

These problems represent those, which cannot be classified in the other two categories. There are a high number of problems here, which are related mainly to administrative situations surrounding the scheme.

- Digital system for inscribing projects into the BPIP is not working yet

- Lack of ex-post evaluations
- Scheme not always followed by the institutions
- No public investment law
- Lack of execution capacity
- No direct communication between Ministry of Planning and Ministry of Finance
- Low accountability for bad decisions
- Updating the status of the project on the BPIP has become just a formality

8.2.4. Summary

Table 8-1 is a summary of all the problems encountered through the interviews, presented according to the classification given before.

Table 8-1. Types of problems encountered, according to the classification given: choice of concept, financing and other types of problems

Classification	Problem encountered
Problems related to the choice of concept	Sectoral and regional secretaries not fulfilling their role
	Low emphasis on social profitability measures
	Projects implemented due to political interests
	Low-qualified personnel
	No definition on projects entering the scheme
	No project portfolio on a country level
	Front-end phase not being prioritized
	PND renovated every 4 years
	Responsibility of the scheme on the institutions
	Recommendations from LANAMME are not binding
	Environmental decisions taken too late
	Unstandardized processes to identify priority projects
Problems related to the forms of financing	MIDEPLAN is not responsible for the budgetary decisions
	Financing agreed upon before feasibility studies
	International cooperation has big influence on projects
	Unreal budget on change-of-government years
	The budget is seen annually
Other types of problems	Digital system for inscribing projects into the BPIP is not working yet
	Lack of ex-post evaluations
	Scheme not always followed by the institutions
	No public investment law
	Lack of execution capacity
	No direct communication between Ministry of Planning and Ministry of Finance
	Low accountability for bad decisions
	Updating the status of the project on the BPIP has become just a formality

9. Discussion

This chapter aims to answer the research questions proposed in the Introduction chapter. It also addresses the implications of the characteristics found in the Costa Rican scheme, comparing them to the Norwegian and British models. Finally, it suggests recommendations to the Costa Rican scheme, based on the problems encountered by conducting interviews with public officials.

In the context of this research study, it is important to mention that there were some limitations surrounding it. First, time was an important constraint, and the scope of the study was limited to it, which was only four months. Second, the amount of interviews conducted is not enough to fully determine if the problems identified are perceived in the rest of public institutions. Third, the study was conducted from Norway, without a direct contact to the situation in Costa Rica. Finally, issues with the methodology are bound to happen, and they are discussed all throughout the discussion when identified.

9.1. Comparison between the Norwegian, British and Costa Rican schemes

This section presents the main characteristics of the quality assurance schemes in Norway, the United Kingdom and Costa Rica. Addressing these results seeks to answer the first research question:

- What are the main differences between the Norwegian, British and Costa Rican quality assurance schemes?

Table 9-1 is inspired from the summary done by the Concept Programme on the Concept Report no. 47 (Samset et al., 2016), which presents a summary of the key components of each quality assurance scheme from 6 different countries. The table presented here compares the schemes of Norway, the United Kingdom and Costa Rica.

For the discussion, the differences and similarities are presented in each of the main criteria identifying each scheme.

Table 9-1. Differences and similarities between the Norwegian, British and Costa Rican State Project Models

Criteria	Norway	United Kingdom	Costa Rica
Responsible of starting the process	Ministry of Finance	Agency under the Cabinet Office	Institutions within the Government
Decision on the budget	Parliament	Treasury	Depending on the financing system
Sectors included	All, with some exceptions	All sectors	All, with some exceptions
Threshold value	750 million kroner	Those projects considered "large"	No
Performer of quality assurance	External consultants	Independent quality assurance	Ministry of Planning and Ministry of Finance or CGR
Approval in every stage	No	Yes	No
Parliament or Congress involved in decision making	Yes	On exceptional projects	Depending on the financing system
Consideration of alternatives (including zero-alt)	Yes	Yes	Yes
Approval by the Ministry of Finance	Yes	Yes	Depending on the financing system

9.1.1. Responsible of starting the process

First, there are different institutions responsible for starting the process in each country. In Norway, the Ministry of Finance has the task of carrying out the scheme, even when it does not perform the quality assurance. An agency under the Cabinet Office, which includes the Ministry of Finance and the Office of the Prime Minister, receives the quality assurance reports and, from there, takes the decision whether to continue the project through the various decision gates or not. In Costa Rica, the process is different, and it is responsibility of the institutions interested in the project to carry out a proper choice of concept, based on the guidelines given by the documents published by the Ministry of Planning. Once this process is completed, the Ministry of Planning checks and approves the registration of the project on the BPIP (Appendix H), which gives the institution the possibility to negotiate the financing, which will vary depending on the institutions and the form of financing.

Both in Norway and in the United Kingdom, the Ministry of Finance (included in the agency under the Cabinet Office in the UK) is responsible of carrying out the scheme. Costa Rican institutions are responsible of their own projects. This includes proposing the project, considering all the criteria for the choice of concept, registering it into the BPIP, updating it and looking for financing. Even when the Ministry of Planning checks the completion of these

phases, it does not promote the projects itself, but leaves the responsibility to the institutions. A similar situation is present into the Ministry of Finance, because it responds to the budget requests that each institution makes, primarily the Ministries.

The Ministries are influenced by political decisions, starting by the fact that the role of the Minister is precisely a political position. Therefore, the politically interesting projects will always have at least a slight advantage in the prioritization. When the institution is responsible to carry out the process up until the final decisions, there is a great chance for the project to be approved. This goes against a good practice of prioritizing projects analyzed from different criteria (see Chapter 6) instead of giving more value to political pressure. Of course, this does not necessarily happen to every project proposed by the Ministries, but with the current situation, it opens a doorway for possible abuses of the system, instead of proposing sustainable and relevant projects (Chianca, 2008).

Nevertheless, it is important to understand that the scheme in Costa Rica was introduced recently and that drastic measures cannot be expected to happen overnight, especially with the current capacity to handle projects and the training received by the public officials.

9.1.2. Decision on the budget

In Norway, the decision on the budget relies on the Parliament for every project that enters the scheme. HM Treasury in the United Kingdom is the one responsible for decisions of budget allocation. In Costa Rica, the decision on the budget for investment projects depends on the kind of institution proposing the project. The Ministry of Finance handles projects proposed by the Central Government, namely Ministries. The General Comptroller (CGR) decides on the budget for projects proposed by decentralized institutions. Both of these forms of financing the projects occur only when public budget is utilized. If the project requires the State to get into debt, several other institutions take stage-gate decisions, ending with the final decision by the Congress. Chapter 7 has a further explanation on this topic.

Having the Parliament or the Congress involved in the final decision for approval of every project has positive and negative outcomes. It may serve as a form of controlling the whole system by requiring a structured process that finishes with an approval by a democratic vote, which can show aspects not considered before. On the other hand, it hinders the development of the project by making all the processes even more bureaucratic (Nilsson, 1991). At least in the Costa Rican setting, projects that need to be approved by the Legislative Assembly are

constantly delayed by the arguments aroused between the deputies, who represent different political parties and have different ideologies. In addition, deputies do not normally have the technical expertise to make a grounded decision on this topic, contrary to public officials who are trained for that (By, 2005).

It is also important to mention that leaving the members of the Parliament or Congress out of the decisive stage, especially when the project has an impact on the national finances, is not a desirable idea. Keeping that train of thought, it seems that the approach chosen by the United Kingdom and Costa Rica is more suitable, leaving only exceptional projects to the decision of the Parliament or Legislative Assembly. It is also known that in Costa Rica, the involvement of the Legislative Assembly is dependent on the type of financing used for the project (see Chapter 7).

9.1.3. Sectors included

Norway includes all sectors into the scheme, with some exceptions such as offshore oil and gas investment, and state enterprises and state-owned corporations. In practice, the scheme primarily includes transport projects, except aviation, defense, central government and major ICT projects (Samset et al., 2016). All sectors are included in the British scheme. The Costa Rican scheme also includes all sectors, with some exceptions. These exceptions are Universities, the Judiciary Power, the Supreme Court of Elections and the public banks (MIDEPLAN, 2012b).

Including all sectors into the schemes is seen as a positive approach to handling the scheme and managing the projects. Leaving some sectors out would mean biased prioritization of projects and unorganized processes among the institutions (Intv. 1, App. I). Even when in Costa Rica ex post evaluations are not being performed yet, it is a plan for the immediate future (Intv. 1, App. I), and having unstandardized processes will only complicate the studies. The few institutions left out of the scheme in Costa Rica happen to have a different autonomy, accompanied by laws and regulations, which are out of the scope of this research study and, therefore, not explained.

9.1.4. Threshold value

Norway has an established threshold value for the projects entering the scheme, 750 million NOK as of 2016 (Samset et al., 2016), while in the UK, only those projects considered “large”

are handled this way. There is no specification on which projects are considered large, but they are typically larger than the threshold established by the Norwegian scheme (Samset et al., 2016). In Costa Rica, there is not an established threshold for the projects within the scheme either, but, based on the interviews, minor institutional internal projects are not considered because those are carried out with internal funding (Intv. 2, App. I), independent from external institutions.

A threshold value in this context will limit the number of projects entering the scheme. This way, excess of bureaucracy is avoided, which is seen as an advantage, considering the cost that represents using resources on carrying out the scheme. In Costa Rica, even when there is no established threshold value, minor internal institutional projects are not considered into the scheme, given the fact that the institution is responsible of their own budget and those minor projects can fall into that category. However, it is considered important to establish a threshold for the projects entering the scheme, ensuring this way a proper front-end management for those projects considered strategic by making them enter the scheme.

On the other hand, manipulations on cost estimation might happen when a threshold value is established (Samset et al., 2017). This way, a project can be underestimated to avoid going through the scheme, but at the same time a project can be overestimated to establish it as a priority and receive more funds and faster than other projects that should be getting them. A situation like this will definitely undermine the efficiency of the scheme. Therefore, regulations and proper cost estimations need to be reinforced in Costa Rica.

9.1.5. Performer of quality assurance

External consultants, independent from the institutions, perform the quality assurance in Norway, for both decision gates of the scheme. In the UK, the quality assurance is carried out by a team of project experts who are independent from the project, but it is important to mention that all ministries have independent responsibility for handling the quality assurance (Samset et al., 2016). In Costa Rica, the Ministry of Planning is the entity responsible for checking the presence of all the elements required by the guidelines (MIDEPLAN, 2012a). However, it is responsibility of every institution to follow and fulfill these guidelines, as well as registering the projects into the BPIP. The financial decision about funds allocation is given by different institutions, depending on the case and if the project requires public debt.

External consultancy for quality assurance ensures transparency (OECD, 2002) in the decision-making because these entities are outside the government and thus not influenced by political interests. This situation is ideal when it comes to the project concept choice, leaving the decisions to fully trained professionals, who will make sure that a systematic approach has been used. This scenario is present in Norway and, to a lower scale, in the UK, where the assurers are independent from the project but are mainly part of the government.

Costa Rica has not established a system where someone from outside the institutions is responsible for the decision-making in the choice of concept. This may be perceived as a downside of the scheme, but it is important to consider the Costa Rican situation as a developing country and with limited resources. That being said, it becomes more important to hire and train people within the government who can be able to carry out the scheme in a proper manner.

9.1.6. Approval in every stage

The Norwegian scheme has only two approval stages, while the British one has approval in every stage (see Chapter 5). The Costa Rican scheme here resembles more the Norwegian because it has two main approval stages: the one after the project has been formulated and presented, and finally the financial decision about the project. This also depends on the form of financing, as public debt requires several more entities to give their approval.

Considering the population in Norway and Costa Rica compared to the United Kingdom, with the number and size of projects this situation leads to, it can only be understandable that the British scheme has more approval stages. This scenario is ideal, since it guarantees quality assurance in several steps, assuring a well-grounded project.

A disadvantage for the Costa Rican scheme, and the Norwegian one, is that many resources will have to be used before the initial, and then later before the final, stages. If the project is not approved, the conception of the project needs to be reevaluated, which will take many resources once again. Therefore, and considering the size of the country and number of projects, proper training needs to be implemented for the public officials (Intv. 1, App. I), to avoid reevaluation of proposals, since these ones need to be in accordance with the strategic plans.

9.1.7. Parliament or Congress involved in the decision-making

The Parliament in Norway takes the final decision on all the projects entering the scheme. The Parliament in the United Kingdom will only be involved in the decision of prioritizing individual projects in exceptional cases, where the annual budget is low on detail and usually adopted (Samset et al., 2016). In Costa Rica, the Congress will only be involved in the decision making if the project requires public debt for the State.

Section 9.1.2 explains the positive and negative outcomes of involving the Parliament or Congress in the final decision-making. Besides the bureaucracy it represents, the political interests within the Legislative Assembly can be enough to promote or hinder a project. The AL approves the national budget, which is presented by the Ministry of Finance, but it does not really go into detail about the projects, leaving a freedom of choice to the heads of institutions to develop their own projects, if they are inside the budget's framework and the financial situation of the country. Therefore, only projects that require public debt will be evaluated by the Legislative Assembly.

9.1.8. Consideration of alternatives

All the Norwegian, British and Costa Rican schemes require the project to enter the scheme after considering alternatives, including the zero alternative.

Considering alternatives when proposing projects enables the initiative to be seen from different perspectives, and be challenged by other proposals to address the problem. However, very rarely are alternatives really different from each other, being almost always the same solution with a small twist. For example, a road that goes from point A to point B, and the alternatives being that the road is made of asphalt or concrete, or that it goes through a determined area or another.

In Costa Rica, there is no definition about the nature of the alternatives (MIDEPLAN, 2012a), which will most likely lead to the project explained above. It becomes a necessity to have competent people who can propose such alternatives to address the identified problem properly.

The zero alternative in Costa Rica is not really considered either. The guidelines require a study of the current situation, and analyzing if it is possible to improve it (MIDEPLAN, 2012a), instead of creating something new from scratch. The zero alternative actually refers to not investing at all, seeing the possible solutions worse than the current situation (Samset, 2015).

9.1.9. Approval by the Ministry of Finance

The Ministry of Finance is involved in the three schemes, but in Costa Rica it may or may not be part of the decision-making process depending on the institution presenting the project and the type of debt necessary to finance it.

The complex and uncommon system used in Costa Rica for the approval of the national budget makes it hard to compare it to other systems around the world. The Ministry of Finance is involved in the decisions when it comes to public investment projects, but not in the way implemented by Norway and the UK (Samset et al, 2016). First, when it is involved, it does not approve the projects, but a global budget, which includes, among many other aspects, investment projects. And second, not every project that enters the scheme established by MIDEPLAN needs the approval of the Ministry of Finance (see Chapter 7).

Having such characteristics does not appear to be the ideal scenario for the proper development of public investment projects, but it is now so entrenched into the Costa Rican public system, and the number of laws and executive orders around it are so many, that it seems to be next to impossible to change the way it works. Nevertheless, and understanding the limitations this system may provide, it is important to make sure that all institutions make their job successfully and that there is no duplicity of functions between them, which will only end up in a waste of resources.

9.2. Importance of the criteria for the choice of concept

This section presents the criteria used for the formulation and selection of projects in Costa Rica. It is based on the documents published by MIDEPLAN surrounding the scheme, and aims to answer the research question:

- Which aspects are considered in the choice of concept in the Costa Rican scheme?

Table 9-2, which was first presented in the results chapters, is a summary of the different criteria considered for the choice of concept for projects in Costa Rica.

The fact that six different types of analysis are required to register a project into the BPIP shows the efforts of Costa Rican authorities to have a project concept choice, where the decisions are taken based on thorough evaluations, considering the many different criteria exposed.

Table 9-2. Criteria for the choice of concept for projects under the Costa Rican State Project model

Type of Analysis	Aspects considered
Identification	Problem identified, Optimization of zero alternative, Alternatives, Project objectives, Expected results, Adjustment to development plans, Influence area, Beneficiaries
Market	Market conceptualization, Characteristics of goods and services, Objective population, Demand and supply estimation, Prices and rates analysis, Commercialization channels, Information and divulgation strategies
Technical	Geographic location, Size, Technologies, Engineering, Opinion of the community about the technical proposal, Social responsibility
Disaster risk	Siting of the location, Vulnerabilities identification, Quantification of risk to disasters, Risk reduction alternatives, Cost and benefits from mitigation of risks
Environmental	Evaluation of environmental impact, Corrective/compensatory measures and their costs
Legal	Adjustment to current legal norms, Characteristics of the legal framework
Administrative	Organization and administrative structure, Planning and programming of the execution, Evaluation of institutional risks

9.2.1. Identification of the project

The identification of the problem aims to give a proper background to the project proposed. That includes the identification of needs and the alternatives of projects that can solve the problem aroused. The objectives of the project need to be defined, including the expected results that the project is going to have. One of the most important criteria within the identification analysis is the adjustment to the development plans that the project has, that is, how well aligned it is to the country's strategy. The proposal of the project also needs to establish the influence area and the beneficiaries from the implementation of the new project.

Doing a proper identification of the problem and needs is the most important step when the conception of the project begins. This phase determines if the project chosen is the right one and, because of precisely that, all resources needed should be used for this phase, aiming to ensure the achievement of a successful project.

9.2.2. Market Analysis

By performing a market analysis, the goods and services required to solve the problem are identified, as well as the offer and demand of those services, considering the affected and the objective population. The prices and rates of those goods and services, and how are they going to be commercialized, will determine the viability of the project.

A market analysis is necessary during the front-end phase of any project, even if the identification points to the direction of a determined project, since if it is completely unviable in terms of market, the project should not be implemented. It is necessary to remember that the project should consider the three pillars of sustainability (Haavaldsen et al., 2012), and the economic element is as important as the other two.

9.2.3. Technical Analysis

The technical analysis gives the possibility to evaluate different technological options that could be used to develop the project. To perform a technical analysis, the location and siting of the project needs to be defined, which will lead to initial engineering studies that also include an incipient project management program. During the technical phase, the interests of the people affected by the project should be considered, and informing them of the consequences and impacts derived from the project, keeping social responsibility (International Standard, 2010) to the community.

Addressing technical issues from an early phase guarantees a successful project management. In addition, defining elements such as location and identifying engineering challenges make the cost estimation more accurate in the early phases, translated to less cost overruns in the implementation phase. The less uncertainty a project can have in the early phases, the less changes and cost differences it will suffer in the end (Samset, 2015). Projects are many times proposed with an ungrounded initiative (Intv. 6, Appendix I), which will only lead to undefinition, delays and extra costs. Completing this phase by considering the mentioned aspects will direct the project towards a successful completion, both in terms of the project and the project management (De Wit, 1988).

9.2.4. Disaster Risk Analysis

The disaster risk analysis identifies the vulnerabilities and threats to be faced by a determinate region, as well as the mitigation measures to be taken to suppress those threats. This analysis has to be performed considering the effects in the long-term, since disasters will continue to happen in the years to come.

The analysis considering risks to disasters is of vital importance in Costa Rica, given the fact that the nature is very active all throughout the country: earthquakes, floods, droughts, active volcanos, high precipitations, among others. In addition, disasters caused by the intervention of

people are also present. It becomes, then, very important to propose different alternatives of mitigation measures, identifying their scope and the possible damages that the project will suffer after they have been implemented.

Applying mitigation measures will, of course, represent a cost, which needs to be identified when the financial situation of the project is evaluated, keeping in mind the three pillars of sustainability (Haavaldsen et al., 2012) in the decision-making. The analysis of the zero alternative becomes more relevant when big damages could occur to a new project, and the disaster risk analysis needs to be performed to guarantee such consideration.

9.2.5. Environmental Analysis

The environmental impacts that the project is going to cause need to be identified, as well as every intervention measure possible to mitigate the damages to the environment. This analysis is to be submitted to financial, cost and socioeconomic evaluation, to minimize errors on cost estimations around the different alternatives proposed. There could also be a positive impact on the environment by the implementation of the project, and this also needs to be considered. The intervention measures to address the impacts identified can be protective, corrective or compensatory.

The environmental issues need to be addressed carefully when proposing a project. Impacts on the environment can have fatal outcomes to the country and the world, like, for example, destroying natural habitats or gradually reducing the number of species. This is the most important precaution to be taken, but leaving aside that situation, not evaluating environmental impacts can have a serious negative effect on projects. The power possessed by environmental groups is considerably large, and the ability they have to delay or definitely stop a project is high (Intv. 7, App. I). Therefore, a serious and thorough environmental analysis must be performed, especially in a country like Costa Rica that has a big percentage of the world's diversity (INBio, undated). Furthermore, climate change has become an issue lately, and this is a problematic that needs to be dealt with, which is still not part of the strategic agenda in the country (Intv. 1, Appendix I).

9.2.6. Legal and Administrative Analysis

The legal analysis includes considering all the current laws and regulations, including the legal framework surrounding the implementation of the project. The administrative structure,

including the role of every stakeholder (Samset, 2010), the managerial responsibility, the process of planning and programming, and the possible institutional risks need to be included.

The problems generated by a poor legal planning will result in delays, cost overruns and other complications throughout the project. In addition, properly planning the administrative structure will ensure project management success.

Situating the project within the current legal framework is one of the most important requirements for avoiding future problems. Major public investment projects will experience the scrutiny of the press and opposing groups, and any legal foul will have repercussions in the correct development of the project. Furthermore, even when the project is of political interest, any legal problem will subtract credibility to the officials proposing the project, which can be translated in decrease of votes during the elections.

9.3. Issues surrounding the financing of projects in Costa Rica

This section discusses the different forms of financing in Costa Rica, trying to solve one of the research questions proposed for this research study:

- Which are the different forms of financing projects in the Costa Rican model?

This research question was chosen as a way of comparing the financial decision stage of Norway and the United Kingdom to the Costa Rican scheme. It is relevant for the purpose of this research because the allocation of funds for projects should depend on the criteria for the choice of concept.

The source of financing for projects in Costa Rica varies significantly depending on the institution proposing the project. The way projects are handled, then, also varies depending on the institution, because the request for funding will not be the same.

The Ministry of Finance only approves around 34% of the national budget and the General Comptroller (CGR) approves the remaining 66%. The latter is not public knowledge, unless investigated (Intv. 6, App. I), which subtracts transparency (OECD, 2002) to the operations. Handling public funds this way has created some astonishment in different parts of the world because of its uncommonness. This means that there are two institutions, and sometimes three or four in some cases, which approve and allocate the resources for public investment projects

(see figure 7.1). This can become a problem if the decisions are not being taken homogenously. For example, the CGR does not check the budget proposed in such detail as the Ministry of Finance (Intv. 6, App. I). This means that the institutions will receive a budget for their projects, which has not been scrutinized as it should be.

The system becomes even more complex when public debt is required, adding the binding macroeconomic analysis from the Central Bank, the approval of the Ministry of Finance and the Budgetary Authorities, with a final approval vote by the Legislative Assembly, which includes political interests. This process is understandable and necessary, since the project will have an economic impact on the country's economy, both in macro and micro levels. However, having so many decision stages slows down the process, which can lead to cost overruns.

The main issue detected when financing projects is that a big percentage of them are being funded by external loans. This situation has two main disadvantages: first, Costa Rica should not incur in so much debt, because it will get to a point in which the debts will become unmanageable (Intv. 4, App. I), and serious negative economic effects will impact the country. Second, international organizations, being the entities financing the projects, have a direct influence on the project, many times defining its scope.

Besides, if the financing of the project is granted by an international entity but the project is never executed, the country still needs to pay for the interests charged by the banks and other institutions for borrowing the resources (Intv. 10, App. I). This situation may lead to prioritize projects which are not aligned with the current strategy established in the PND.

In addition, the financing of these projects only includes the implementation phase, and only to a certain point, which forces the State to prioritize these projects (Intv. 6, App. I) and give all the resources needed to complete and operate them. This translates into less resources to other projects, or even to other institutions, which may be more important to the development of the country. Therefore, international cooperation needs to be addressed carefully. Sometimes the assistance it offers may be detrimental for the country's interests.

In the first scenario, where the institutions of the Central Government are the ones proposing the projects using the national budget presented by the Ministry of Finance, as it can be expected, sometimes the budget limit assigned to a determinate institution is not enough for carrying out their projects. Therefore, they ask for an extra-limit budget. This, of course, means that the budget of another institution needs to be reduced (Intv. 6, App. I). When more

institutions, or most, present the same request, the prioritization of the budget becomes even more difficult for the Ministry of Finance.

The end result for the budget is that the analysis for prioritizing it is done considering basically only the economic profit of the projects. Leaving the other two pillars of sustainability (Haavaldsen et al., 2012) out of the analysis represent a major flaw in the choice of concept, because some projects that are necessary for the country cannot be implemented, only due to economic reasons. It is, of course, obvious that the finances of the country cannot be altered negatively, and that the economic point of view represents a big decision criterion, but not aiming for sustainability is the opposite way to development in public investment.

9.4. Suggested measures for the problems identified in the Costa Rican scheme

This section discusses the problems identified by conducting the interviews with public officials in Costa Rica, and in some cases suggests a measure to be implemented, in an effort to solve the stated problem. It seeks out answering the final research question:

- Which are the most relevant problems associated with the quality assurance scheme implemented in Costa Rica?

Table 9-3 summarizes the problems to be discussed.

9.4.1. Problems related to the choice of concept

1. Sectoral and regional secretaries not fulfilling their role

The fact that the sectoral and regional sections of the governmental institutions are not fulfilling their role identifying needs and problems becomes an extra workload to the central offices of the institutions. As a result, officials end up doing analysis and proposals that, in theory, they are not supposed to be doing. In addition, by leaving that responsibility to the heads of the institutions, political interests might affect the choice of concept, both consciously and subconsciously, by prioritizing initiatives and "looking for" problems with a biased judgment. This scenario is prone to happen especially in the Central Government.

Table 9-3. Types of problems encountered, according to the classification given: choice of concept, financing and other types of problems

Classification	Problem encountered
Problems related to the choice of concept	Sectoral and regional secretaries not fulfilling their role
	Low emphasis on social profitability measures
	Projects implemented due to political interests
	Low-qualified personnel
	No definition on projects entering the scheme
	No project portfolio on a country level
	Front-end phase not being prioritized
	PND renovated every 4 years
	Responsibility of the scheme on the institutions
	Recommendations from LANAMME are not binding
	Environmental decisions taken too late
	Unstandardized processes to identify priority projects
Problems related to the forms of financing	MIDEPLAN is not responsible for the budgetary decisions
	Financing agreed upon before feasibility studies
	International cooperation has big influence on projects
	Unreal budget on change-of-government years
	The budget is seen annually
Other types of problems	Digital system for inscribing projects into the BPIP is not working yet
	Lack of ex-post evaluations
	Scheme not always followed by the institutions
	No public investment law
	Lack of execution capacity
	No direct communication between Ministry of Planning and Ministry of Finance
	Low accountability for bad decisions
	Updating the status of the project on the BPIP has become just a formality

The scope of this research study does not cover counting how many officials each institution has, or analyzing if they should employ more. However, one of the main complains identified during the interviews was the low capacity to carry out projects from the front-end phase. It is known that using more resources in the early phases will give better results in the implementation and operation phases (Samset, 2015), not to mention that it guarantees choosing the right project (Haavaldsen et al., 2012).

Nevertheless, the institutions within the government cannot employ people for every regional section they have, because the economical workload for the State would increase enormously. This becomes even more dangerous when it is considered that it is hard to dismiss officials from their labors (Intv. 1, App. I). Having a high number of people that are not needed and cannot

be easily dismissed represents an even higher utilization of resources, by reassigning them on jobs they are not trained for.

The proposal, then, is to increase gradually the number of people carrying out the projects from the early phases. It becomes crucial that these people are educated and properly trained in the subject, assuring that they can cope with the job. This can be applied in the institutions handling the biggest projects, as a tryout method, which can later be introduced in the rest of the institutions, depending on the success of the implementation.

2. Low emphasis on social profitability measures

The most important criteria for project selection is still the economic profitability. The authorities understand that implementing sustainable projects is the right path to a successful development of the country (MIDEPLAN, 2012b), but there is still a resistance towards projects that do not give a positive economic benefit-cost ratio.

Reinforcing these theories, and introducing this new paradigm to people who have always done their job focusing on the economic issues, represents one of the biggest challenges for those responsible of handling the scheme. The Ministry of Planning, in their guidelines (MIDEPLAN, 2012a), has described different methods to justify projects when they are not economically profitable (App. F). However, not all institutions are following these guidelines (Intv. 2, App. I) and these methods are not being considered yet. Proper training and convincing people to introduce this way of thinking into their jobs are the suggested answers to these problems.

3. Projects implemented due to political interests

It is no secret to anyone that political interests play an important role when selecting projects (Shiferaw et al., 2012b). This is a common situation all over the world, because investment projects serve as a great platform to attract votes for incoming elections. However, this does not mean that it is a correct way to carry out projects.

Introducing political interests may lead to a lack of transparency (OECD, 2002) by the authorities. This situation gets worse if the projects are not aligned with the country's strategic plans for development. The criteria for the choice of concept presented in Chapter 6 has the function to avoid the influence of politicians in the identification of needs and proposal of projects. Assuring that the institutions follow the scheme is the challenge faced by the authorities. This can be done by implementing a public investment law, which protects the correct functioning of the scheme, forcing the institutions to adjust to it.

4. Low-qualified personnel

There are not enough educated project managers, who can take the responsibility of successfully carrying out projects in Costa Rica (Intv. 1-4-6, App. I). In addition, the process of hiring new employees does not help the heads of departments to acquire the talented people necessary for the job (Intv. 1, App. I). Furthermore, there are officials, who have worked in the institution for many years and cannot be dismissed.

Because of this situation, heads of departments do not have available human resources to carry out projects. This situation worsens when even the head of department is not qualified to lead the processes. An important restructuration of the hiring and firing model needs to be implemented, assuring the government the acquisition of the best people available in the market, instead of leaving them for the private sector.

5. No definition on projects entering the scheme

The guidelines proposed by MIDEPLAN (2012a) do not specifically state what kind of projects should enter the scheme. By not delimiting the scope of the scheme, a door is open for institutions to avoid it, in an effort to spare resources. This situation is present regarding both the financial situation, stated in the threshold value, and in the choice of concept.

With such a broad definition of project (Pinto, 2016), which can go, for example, from building a road to changing a lightbulb, a need for establishing the limits that define the projects entering the scheme arises. Leaving this decision to a subjective opinion does not guarantee a proper scheme performance, in the sense of including the strategic projects for the country.

6. No project portfolio on a country level

The BPIP aims to gather all the projects in a single place, with the purpose of identifying all the national needs to decide on taking investment actions (MIDEPLAN, 2012a). However, projects are not prioritized using the BPIP, at least not all of them as a whole. This means that a proper project portfolio (Pinto, 2016) is not implemented in Costa Rica yet.

On top of that, different institutions approve the national budget (see Chapter 7), and they are not focusing on the budgets approve by the other entities. Specifically for the Ministry of Finance, following the scheme is part of the requirements to request funding, but they do not check that the project is registered into the BPIP (Intv. 6, App. I).

An interview with an official from the General Comptroller should have been conducted to know the status of the mentioned situation in this institution. Nevertheless, the problem is there and it should be addressed. It becomes worthless to register projects into the BPIP if the decision-making is not considering it nor comparing the projects against each other to prioritize them.

7. Front-end phase not being prioritized

Employing resources in the early phases of the projects has not yet become a priority for those responsible of carrying them out in the different institutions. On the positive side, some people have become aware of its importance for project success (Intv. 9, 10, App. I). This sets up ground for further improvement and more people adopting this way of thinking.

The challenge, as mentioned before, lies upon the government to convince these people, and themselves, to handle projects with more emphasis on front-end management (Samset, 2015). Thinking that it is too expensive to perform feasibility studies before the implementation phase needs to stop. A continuous flow of information regarding the subject, showing the advantages of front-end management, will gradually change the mindset of those who are still skeptical.

8. PND renovated every 4 years

The National Plan for Development (PND), supposed to be a long-term strategy, can be subject to changes every four years (Intv. 7, App I), which absolutely hinders its long-term role in the development of the country. While it is considered a good practice to establish the PND, the authorities need to realize that it has become merely a government plan, with no guarantees that it will not be drastically changed with the change of government.

Even when it is unlikely that this situation will happen in a way that the country's objectives are completely changed in the near future, opposing political forces have gained strength lately. If eventually a change of ideology raises to power, the PND is not grounded enough to stop a change of direction.

It is recommended, of course, that the National Plan for Development should be revised every 4 years, but it needs to follow a strategic line, which must be separated from any political interests (Shiferaw, 2012b). Legal actions should be taken to protect the stability of the PND to guarantee the development objectives proposed for the country.

9. Responsibility of the scheme on the institution

The institution proposing the project is the only responsible for carrying out the scheme properly and registering the projects into the BPIP (Intv. 1, App. I). This means that no external evaluation exists to quality assure the decisions taken. In other words, the choice of concept is left to people who may respond to their own interests when selecting projects, or at least the interests of the institutions they represent.

On the other hand, hiring external evaluations would represent a great cost for the country, which will probably not be able to afford them, because of its development status. Norway is one of the richest countries in the world, and has the budget to implement such a measure (Samset et al., 2016), but that is not the case of Costa Rica. Therefore, finding other ways to assure proper project management become necessary.

The main suggestions are, on the same track as in previous sections, the constant training of public officials surrounding the scheme and the modification of the laws and regulations that can assure a protection of the scheme. This way, even when own interests are involved, it becomes much harder to influence the prioritization of projects because a proper systematic approach has been implemented.

10. Recommendations from LANAMME are not binding

The National Laboratory of Structural Materials and Models (LANAMME), as an institution adhered to the University of Costa Rica (UCR), performs constant research and studies on public projects and gives recommendations to project managers about structural issues.

However, there are two downsides around this situation. First, the studies are not normally performed during the front-end phase, which was exposed in point 7. If any recommendations or warnings arise as a result of the studies, they will be identified when any changes are very costly for the project (Samset, 2015). Second, these recommendations are not binding. There have been cases where LANAMME recommends a certain structural measure for a project, but the project managers did not follow it, ending up in many issues that could have been avoided (Intv. 8, App. I).

Again, a legal framework (von Bogdandy et al., 2010) that guarantees that institutions follow these recommendations needs to be implemented. Furthermore, involving LANAMME in early decision stages will guarantee a technical success, at least on structural matters.

11. Environmental decisions taken too late

The guidelines published by MIDEPLAN (2012a) require the environmental analysis, mentioning how it needs to be done, involving SETENA for their approval. However, environmental groups are not considered when doing these analyses, and will become active stakeholders until after the project has gained press coverage (Intv. 7, App. I). In this stage, many resources will have been spent on the project, and the possibility of stopping the project for environmental reasons represents a catastrophe for the country's financial situation, for the politics and for the beneficiaries of the project.

Environmental groups, being experts on the field, need to be consulted in the early phases. This way, in case of a highly negative environmental impact, alternatives for the project can again be evaluated, always having sustainability (Samset, 2010) as the main decision criterion.

Unfortunately, the environmental issues were not covered during most of the interviews, since the awareness of it was gained after the interviews were performed.

12. Unstandardized processes to identify priority projects

During the interviews, an awareness on front-end management and proper project prioritization was noted. Furthermore, some of the UPI within the government entities have already started to develop internal institutional plans to improve their process in the formulation and selection of projects.

Although the gradually positive results that will be obtained by these institutions, not all of them have shown these improvement efforts. The Ministry of Planning, then, needs to keep training public officials from all governmental institutions, aiming for a homogeneous process. Simply put, those responsible of managing projects should be "on the same page", independent of the institution they work in.

9.4.2. Problems related to the forms of financing

13. MIDEPLAN is not responsible for the budgetary decisions

By having a separation between the choice of concept and the financing of projects, the link for an integral decision-making breaks. As mentioned in Chapter 7, after following the guidelines proposed by MIDEPLAN, they have to seek out financing on a different institution, depending on the nature of the project.

With the current financial structure in Costa Rica (see Chapter 7), changing this process seems very difficult. However, aiming for a gradual involvement of the Ministry of Planning into the budgetary decisions should be in the agenda on, at least, a mid-term strategy. Enhancing direct communication between the Ministry of Planning and the financial institutions will assure more grounded and logical approaches in the decision-making process.

14. International cooperation has a big influence on projects

The projects that are financed through international cooperation are greatly influenced by these entities' choice of concept. Most times, they dictate the conditions in which the project will be executed (Intv. 6, App. I) and its purpose.

Besides the obvious possibility that these projects may not be aligned with the strategic plans of the country, they immediately become a priority once they are initiated. Just like any other project, if it has started and there are no major legal, environmental or financial complications, it needs to be finished. Prioritizing a project like these means that some other projects have to be put on hold, until financial resources are available, which can take many years.

On top of that, the financing for these projects does not normally include operations (Intv. 6, App. I), which needs to be requested then from the national budget. This includes human resources and maintenance, on a constant distribution over many years. Therefore, a thorough analysis of the project needs to be done by the authorities, aiming to determine if it is actually necessary for the country and if it adjusts to the strategic plans for development.

15. Financing agreed upon before feasibility studies

Following the same mindset of emphasizing the economic issues regarding the projects, several times one of the first steps taken is to find funding for the project (Gatti, 2008), even without any feasibility studies. The financial institutions conceal the funding based on the current situation. This means that, when the project is finally ready to start, several months or years will have passed and the cost estimation will have been modified, resulting in cost overruns for the project.

Having the funding granted before project execution will mean that there will be idle resources, waiting for the project's approval, studies and designs. Not only they represent a waste of resources, but also there are commissions and interest rates being charged by the banks or financial entities. This represents a loss of money for the country, which multiplied by many projects and years could become enormous.

As mentioned beforehand, international cooperation has a big influence on the choice of projects. Therefore, on top of being somewhat dependent on their decisions for projects, deliberately losing money because of it becomes a major problem. A proper financial structure should be established, in which the assistance given by international cooperation is analyzed in a way that it is only accepted if it is really beneficial for the country.

16. Unreal budget on change-of-government years

An unreal budget sets up ground for misallocating of resources within the governmental institutions. Having that situation once every four years means that 25% of the time, the budget proposed is not thoroughly analyzed when proposed.

This becomes an unacceptable situation, especially if the purpose of public investment is the development of the country (MIDEPLAN, 2014). A system must be established that cannot be influenced by political decisions and changes of government. Institutional planning must also be long-term, in the same way as the PND should be, instead of waiting for the decisions of the new government.

17. The budget is revised annually

The lack of long-term strategies is also visible in that the national budget is only revised annually. This shortsighted strategy does not aim for solutions over time and it does not prepare those responsible for allocating funds for what will be coming ahead in the following years.

Multiannual budgets are beginning to be implemented by the Ministry of Finance (Intv. 6, App. I), but a stronger effort needs to be put in practice to achieve the purposes proposed in the strategic plans for development.

9.4.3. Other types of problems

18. Digital system for inscribing projects into the BPIP is not working yet

There has been training in the usage of the digital system to register projects into the BPIP (Intv. 3, App. I), but the system is not working yet (as of January 2017). Because of this, the projects need to be registered and updated manually, wasting time on a process that could be automated.

Employing resources into developing a digital system and training officials to learn how to use it, to later keeping it unused because it is not working properly, seems like a complete waste of

time and resources. Once the system has been established, efforts should be put to make it work correctly.

The issue here is not if the system was needed or not. That was a question that should have been asked beforehand, but now that it is there, the least that could happen is that it is used. Anyways, to have such a system that helps reduce time into registering projects and updating them is considered a positive idea, which should be enhanced to speed up processes.

19. Lack of ex post evaluations

The quality assurance scheme has been implemented recently in Costa Rica, and some of the projects within this scheme have not been finished yet, or have not even started. Nevertheless, the documents published by MIDEPLAN have not emphasized the need for ex post evaluations yet.

These evaluations represent a more valuable assessment than the ones performed ex ante (Herrick et al., 2016). There is a plan to start including these evaluations in the near future (Intv. 1, App. I), but nothing has been concreted yet. Reinforcing them, understanding the benefits of the lessons learned with previous projects, will guarantee more successful projects in the future.

20. Scheme not always followed by the institutions

Unfortunately, not every project that should enter the scheme actually does. Institutions are currently following the scheme only if it is convenient for them (Intv. 1, App. I), especially when they need financing for the project from the government. If the project can be funded with the institutional budget, many times it falls out of the scheme, to avoid resources spent on the formulation of the project.

First, since either the Ministry of Finance or the CGR approves the institutional budget, not having knowledge of these projects creates an unreal perception of the budget. Second, since there is no project portfolio, there is no overall picture of the projects being implemented on a determinate moment.

Adding the fact that there is no definition about the kind of project entering the scheme, it becomes easy for institutions to skip the guidelines for project formulation and selection. The main problem here is that, by not following the guidelines, there is no guarantee that the project has been put to a reasoned decision-making process, and the right project (Haavaldsen et al., 2012) is unlikely to be the one selected.

21. No public investment law

There are problems mentioned before that could be solved by establishing a public investment law that protects the correct functioning of the scheme. Issues like institutions not following the scheme, political interests in the decisions, the possibility of an unstable PND and not binding recommendations from technical institutions can be avoided.

The implementation of a public investment law becomes a necessity when the current ideology of the governments, independent from their political party until now, includes the understanding of public investment as an engine for the country's economy. With the support of the Legislative Assembly by speeding up processes and approving investment projects (Intv. 7. App. I), the absence of a law seems outdated. The legal loopholes that can be used to avoid the scheme are still present, and people know about them, using them for their own interests.

It represents a challenge, then, for the Ministry of Planning, supported on the Legislative Assembly, to create and approve a law that stops any possibility of weakening the system.

22. Lack of execution capacity

Institutions are not ready to carry out their own projects. This thesis is only focused on the front-end phase of a project; therefore, translated to this set up, this means that the feasibility studies are not being prioritized, leaving them for later phases.

As mentioned before, proper front-end management draws the project closer to success (Samset, 2015). Understanding this, more resources need to be employed on the earlier phases of a project. Researching on lessons learned from previous projects, ex post evaluations, will prove the benefits of front-end management, comparing the cost overruns suffered from changes and failed cost estimations during the implementation phase.

Once these benefits are proved and understood, authorities will be convinced that front-end management is the path to follow to achieve success for the public investment projects in the country.

23. No direct communication between Ministry of Planning and Ministry of Finance

The institutions following the scheme have to adjust to the guidelines published by the Ministry of Planning and then seek financing for the project in another institution, like the Ministry of Finance. This research study did not include the CGR or the AP for the consideration of communication with MIDEPLAN.

Duplicity of functions, inhomogeneous processes and, in general, an unstandardized scheme, hinders the possibility of it working properly. Having several separate institutions handling the scheme in different ways is a drawback for the management of projects.

With the current laws and regulations, and the financial framework established, it is unlikely that one institutions can take the load of handling the whole scheme by itself. Therefore, a public investment law (von Bogdandy et al., 2010) should regulate how projects are handled. In addition, all the institutions responsible for handling the scheme, not the ones proposing the projects, should get together and elaborate a document, which sets a standard for management of public investment projects.

24. Low accountability for bad decisions

When a scandal arises regarding a public investment project and the press covers it and investigates it, many people are found responsible for the decisions taken surrounding the project. The problem comes that these people are not held accountable (OECD, 2002) for these decisions. In other words, public officials do not pay for their negligent or irresponsible actions (Intv. 8, App. I).

After many similar situations have happened, public officials realize that they will not be accountable for their actions. They will not be fired, will not have to pay for any potential damages, or will not even go to prison for those extreme cases. The press has demonstrated several times that projects have been handled incorrectly, pointing out people responsible, and no real measure has been taken by the authorities, being a resignation from their job the only consequence, in some cases.

The need for a law that can punish these actions is needed. The government needs to guarantee that only the best people are taking decisions for public investment projects, and that cannot be assured with the current legal framework.

25. Updating the status of the project on the BPIP has become just a formality

The BPIP requires every project to be updated at least once a year. However, this process has just become a formality, because the financial institutions do not check the status of the project into the BPIP, and this does not represent a criterion for their decision to allocate funds for projects. This statement is only valid, according to this research, to the Ministry of Finance because it was the only financial institution studied.

The problem to be questioned is the necessity of the BPIP. If it is not being useful for any institution, there is no point on having it. On the other hand, it is the starting point for the creation of a proper project portfolio. Therefore, it is considered that the implementation of the BPIP is a positive measure, but it should be reinforced so it actually becomes useful.

This sums up many of the suggestions expressed before: the need for a public investment law, training of human resources and communication between MIDEPLAN and the financial entities, among others. Most of the problems are somehow interrelated around these issues, which need to be improved for a successful scheme.

10. Conclusion

According to the results presented and discussed during the research study, this chapter sums up the findings, which are considered the most important for achieving the purpose of the thesis. In addition, a gathering of the recommendations discussed in the previous chapter is presented. Finally, further research for continuing this study is recommended. This is an initial study on the public investment system in Costa Rica, focusing on the quality assurance scheme, aiming to answer the research questions proposed initially:

- What are the main differences between the Norwegian, British and Costa Rican quality assurance schemes?
- Which aspects are considered in the choice of concept in the Costa Rican scheme?
- Which are the different forms of financing projects in the Costa Rican model?
- Which are the most relevant problems associated with the quality assurance scheme implemented in Costa Rica?

10.1. Findings of the research study

The quality assurance scheme in Costa Rica has been recently implemented, understanding public investment as an engine for the country's economy. The model is proposed and managed by the Ministry of Planning (MIDEPLAN), which is responsible of publishing the guidelines for the governmental institutions to follow.

It has two main decision gates. The first one comes after the choice of concept. This phase is based on the General Methodological Guide for Identification, Formulation and Evaluation of Public Investment Projects, a document published by MIDEPLAN, which guides the institutions in the proposal of their projects. The second decision gate comes with the decision of allocating funds for the project, which stops being responsibility of MIDEPLAN. Put another way, institutions must follow the guidelines but need to seek financing elsewhere, breaking the link with the Ministry of Planning and weakening the system by doing so.

Comparing the scheme against those implemented in Norway and the United Kingdom, the main characteristics to highlight in the Costa Rican scheme are:

- There is no external evaluation

- There is no threshold value for projects entering the scheme
- The Legislative Assembly is only involved in the decision-making on projects that require public debt
- The institutions are responsible for applying the scheme into their own proposed projects

The choice of concept is reasoned by many criteria, assuring that the right project is being chosen when the guidelines are followed. Unfortunately, this is not always the case, since there are several loopholes into the system that open the possibility for institutions to skip the scheme.

Regarding the financing of projects, there are mainly three different scenarios for projects to be funded. The institutions involved in the decision-making and the sources of funding depend entirely on these scenarios:

- Projects within the Central Government funded by national budget, approved by the Ministry of Finance
- Projects within decentralized institutions funded by national budget, approved by the CGR or the AP
- Projects within any institution that require public debt

Finally, by conducting interviews with public officials within different institution among the Costa Rican government body, several problems were identified and classified in three different categories:

- Problems related to the choice of concept
- Problems related to the forms of financing
- Other types of problems

Related to the choice of concept, the problems considered to be more serious are the low emphasis on social profitability measures, projects being implemented due to political interests, low-qualified personnel, front-end phase not being prioritized and the absence of communication with entities regarding the environment.

Regarding the financing of projects, the two most important problems considered are that the financing could be agreed upon before the feasibility studies, leaving room for idle resources and that international cooperation has a big influence on projects for being the financial entity facilitating the funding of them.

Among the other type of problems identified, the main one is the absence of a public investment law, which is the starting point for other problems to happen. For example, that the institutions not always follow the scheme. In addition, the lack of communication between the Ministry of Planning and the Ministry of Finance weakens the whole system.

10.2. Recommendations for improving the scheme

This section presents recommendations to implement on the current scheme that, after carrying out this study research, are considered to be important to improve the quality and aim for successful projects in Costa Rica. These recommendations are based on the information extracted from the discussion aroused in the interviews and from the expertise gained studying the schemes of Norway and the United Kingdom.

First, and most important, it is considered that the scheme should be protected behind a legal framework that guarantees the correct utilization of it. Therefore, the proposal of a public investment law becomes necessary and perhaps it will gradually solve the most important problems identified in this research study. Guaranteeing that the institutions will follow the scheme, the consideration of social profitability measures, standardization of processes, binding technical recommendations and accountability of people responsible for decision-making can be introduced as measures to be taken within the public investment law.

Second, there is a need for highly qualified officials within the government, who can take the responsibility of properly carrying out the scheme. These people need to be trained and exposed to the benefits of front-end management and a good criteria for the choice of concept. Two main measures should be taken: a framework of employing personnel that guarantees that the person hired fulfills all the requirements needed for the job. In addition, constant training of current and new officials, first by MIDEPLAN, and then by their own institutions, to assure that the knowledge remains valid and updated.

The importance of front-end management is recognized worldwide, and the interviewees are aware of it to achieve project and project management success. However, they are not necessarily always responsible for taking the final decisions regarding projects. CEOs and the Board of Directors are normally taking those decisions. Therefore, these people need to be convinced of the importance of it. Ex post evaluations need to be performed to learn lessons from previous projects. This way, qualitative and quantitative analysis can be used to demonstrate the need of employing resources in the early phases.

Regarding the criteria for the choice of concept, and besides following the recommendations published in the guidelines by MIDEPLAN, a thorough analysis for the choice of concept needs to be done when international cooperation is a stakeholder of the project. The focus when formulating and selecting projects should be addressing if the projects adjusts to the planned strategic development of the country. In addition, the possibility to execute the project promptly should be evaluated, to avoid idle resources, which generate an extra cost for the country.

A long-term strategy for development should be implemented. The components of this strategy are already put in place in the Costa Rican scheme, but they need reinforcement, so they can fulfill their role over time. The National Plan for Development (PND) needs to have objectives in the long-term; the BPIP should be within the framework of a public investment law, aiming to become the project portfolio of the country; the national budget should be presented multi-annually, in an effort to put the upcoming years into financial perspective.

Besides taking care of environmental issues in the early phases of the projects, consulting environmental groups and making them part of the decision-making, it is important that the analysis moves towards the impact a project may have on climate change. Being Costa Rica one of the greenest countries in the world, public investment projects need to consider this as well.

To avoid institutions skipping to follow the guidelines for the choice of concept, there should be a definition on which are the projects that must enter the scheme. Delimit the kind of project, its threshold value, the sector and beneficiaries, for example, will keep this situation under control.

Finally, decisions should be taken after all the involving parties have been considered and consulted. This way, their interests will be noted and decisions can be taken with all the available information regarding the needs perceived from different points of view. This can include an information campaign, in which all stakeholders are informed, in an easy-to-understand manner, about the purpose, execution methods and development of the project. This will most likely generate more trust into the governments, approaching the political interests in a positive way.

10.3. Recommendations for further research

This thesis, considering that public investment projects are generally construction projects, was conducted from the stand of a civil engineer. However, this thesis has proved the involvement of many disciplines into a quality assurance scheme on a country level for public investment projects.

First, a legal research could be done, investigating the possibilities for a proposal, implementation and operation of a public investment law. Presenting this to the authorities will ease up the way to actually establishing such a law, avoiding the possible legal loopholes that could arise and the ones that are present currently.

Second, an economic analysis can also be done, going deeper into the functioning of the national budget presented by the Ministry of Finance. Furthermore, investigating the financial issues on projects' budget for the General Comptroller can also be a subject of study. Combined with a legal approach, an investigation could be performed evaluating the current system and determining if it could be improved.

A study of the population's perception of public investment can also be made. This can be useful to identify needs both in the short- and long-term, clearing up the direction in which the strategic plans for development can turn.

Climate change has become an important subject in the recent years, and public investment projects in the country need to start considering it in their analysis. Investigating possible measures and how to introducing into the choice of concept is a topic of interest for investigations.

An important field to investigate is learning lessons from previous projects carried out in the country, both the ones following the scheme and the ones that did not. This could help to understand the errors committed in the previous years and identify potential improvements to be applied to the current scheme.

As mentioned before, this is only a preliminary study. The scheme presented here is simplified and general, when, in reality, every institution has their own scheme based on the guidelines published by MIDEPLAN. It is understood that every institution is different and the kind of projects proposed vary in magnitude and budget. Therefore, it is understandable that their processes are different. However, this should be a subject for the Ministry of Planning to

address, in an effort to standardize the general and most important components of the scheme. A thorough investigation, then, should be performed to all public institutions to determine their way of handling the scheme, focusing on the UPI.

The choice of alternative needs to be investigated, because they should be conceptually different instead of the same solution with a minor difference. Putting more emphasis to the choice of alternatives can guarantee an overall picture of the needs and problems with their possible solutions, aiming to choose the one that suits best for the developing of the country.

Being Costa Rica a developing country, many of the major projects currently implemented are funded through international cooperation. This means that these entities have some, or much, influence in the choice of concept. Therefore, investigation on how these projects are being selected needs to be done, to determine if they really are necessary for the country and do not represent a workload that should not have been taken in the first place. The role of private-public partnerships should also be studied, given the fact that it is rising as one of the most important sources of financing projects in Costa Rica (Intv. 4, App. I).

The introduction chapter explains why the scheme was implemented, which has to do with public investment being left out in the previous decades. However, cost estimation is not mentioned as a reason for performing quality assurance to the projects, just as it was for the Norwegian and British schemes. Improving cost estimation would represent a major asset for public investment, and it could be enhanced even more by the authorities. Therefore, research around the subject and looking for ways to become better at estimating should be on the agenda of those responsible for the scheme.

10.4. Closing remarks

The purpose of this research study is to reinforce awareness in the country about management of public investment projects, setting the path for further research and studies that will eventually improve the system, considering examples from other countries. The wish of a Costa Rican citizen is to take back the privileged place of leading the area regarding public infrastructure, and developing a strong SNIP will lead the country towards that goal.

Finally, the job of civil engineers, which is the point of view of this research, is to assure a proper project management with construction projects, focusing on enhancing the early phases to achieve project success.

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Appendices

A. Conference paper Esteban Alberto Castro Estrada

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Procedia Computer Science 00 (2017) 000–000

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CENTERIS - International Conference on ENTERprise Information Systems / ProjMAN - International Conference on Project MANagement / HCist - International Conference on Health and Social Care Information Systems and Technologies, CENTERIS / ProjMAN / HCist 2017, 8-10 November 2017, Barcelona, Spain

Quality assurance scheme for public investment projects in Costa Rica

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Abstract

Quality Assurance Schemes are implemented by governments due to the necessity to ensure quality in the decision-making process during the front-end phase of a project. Costa Rica is also beginning to implement such schemes in their management of public projects. This paper addresses the differences between the Norwegian, British and Costa Rican schemes. It also points out the criteria considered for the choice of concept and describes the different forms of financing in Costa Rica. Three methods were chosen: a review of literature for the three countries, review of official documentation in Costa Rica and 10 interviews with Costa Rican senior public officials responsible of managing public investment projects. The Costa Rican scheme is more similar to the British than the Norwegian. Main elements assessed in the Costa Rican system include technical, financial, legal and environmental issues. The financing of projects in Costa Rica depend on the kind of institution proposing them and if it requires public debt. This pilot study provides a starting point for authorities to maintain an ongoing research regarding management of public investment projects. Besides, the paper presents how the scheme is currently working, setting foundations for further evaluations to develop a more robust system.

Peer-review under responsibility of the scientific committee of the CENTERIS - International Conference on ENTERprise Information Systems / ProjMAN - International Conference on Project MANagement / HCist - International Conference on Health and Social Care Information Systems and Technologies.

Keywords: quality assurance scheme; state project model; front-end governance; public project governance; Costa Rica; public investment

1. Introduction

There is a growing understanding about the importance of front-end management in the life cycle of public investment projects[1], or any project in general. Quality Assurance Schemes, also known as State Project Models, have been introduced in different countries of the world[2], aiming for project success and project management success. This success is globally defined by 5 criteria, proposed by the OECD: efficiency, effectiveness, impact, relevance and sustainability[3]. Front-end management, and subsequently quality assurance schemes, are focused on the two latter. Relevance and sustainability are within the scope of strategic and tactical planning, as opposed to operational planning[4].

Costa Rica has recently begun to adhere to this tendency, understanding public investment as an engine to the economic system and development in general[5]. Costa Rica is considered a developing country[6], with a small territory of just over 51 000 square kilometers and a population of almost 5 million inhabitants. It has a mean income per inhabitant of around $10 400, as of 2015[7], and a corruption perception index score of 58, situated on position 41 in the world[8].

Costa Rica was considered a leading country in Latin America in terms of infrastructure in the 70s. During the 80s, a recession hit the region, which led the country to experience an increase in financial debt. Trying to heal the economy, public investment stopped being a priority for governments, resulting in a lag on public infrastructure. Recent governments, starting in 2006, have opted to prioritize public investment again by developing a national system for planning public investment projects, with a culmination of a state project model. The purpose of the system is to guarantee that the decisions taken around the formulation, selection and evaluation of the projects have been submitted to a systematic process, aiming for those decisions to be the most adequate as possible. This process includes both qualitative and quantitative analyses, taking into consideration economic, social, environmental and disaster-risk factors[9,10,11].

The main challenge faced by the government is to change the mentality of the people responsible of managing public projects. Establishing a new scheme which has a systematic approach and changing the practices used for many years becomes a difficult task. Constant training and hiring specialized workers are the tools for the government to face these challenges. The government has a very complex system, where different institutions become responsible for managing projects, depending on the sector and financial situation of it.

This paper answers the following research questions:

- What are the main differences between the Norwegian, British and Costa Rican quality assurance schemes?
- Which aspects are considered in the choice of concept in the Costa Rican scheme?
- Which are the different forms of financing projects in the Costa Rican model?

The main limitations encountered by conducting this research were time and accessibility of government authorities. Having limited time leads to a narrower research, which makes future broader studies on the subject a necessity to fully understand the whole system. This pilot study was conducted from Norway, with a limited time for interviews in Costa Rica, which results in some authorities being left out because of their availability during that period.

2. Concepts and definitions

Project governance is a decision-making framework that guides the development of a project and within which the critical project decisions are made. The relationship of the project with the whole development policy of the government is identified, the real problem and the selection of initiatives are analyzed, stakeholders are informed and involved, cost-benefit analysis are conducted, the wishes of people and politicians are considered and the possibility of the proposed project is evaluated[12]. Poor project governance leads to project failure, while good project governance allows effective and efficient decision making[13].

The measurement of time, cost and quality should not be confused with measuring success. When attempting to measure success, one must make a distinction between project success and the success of the project management effort. The project is considered an overall success if it meets the technical performance specification and/or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people in the parent organization, key people in the project team and key users or clientele of the project effort. Therefore, one project can be considered successful even when it did not fulfill one of all the project management success criteria[14].

The term value proposition either addresses the question of how to create value in an internal strategic meaning or is addressed to the supply side to explain how the specific product should provide value for money. It becomes an explanation of what use value the project is intended to enable, in accordance with the owner's strategy[15].

A concept is a mental construction intended to support the solution of a problem or the satisfaction of a need, and dissimilar concepts may be alternative solutions for the same problem. Therefore, the task becomes to identify and test all these concepts to determine which one is the best, which will be chosen as the starting point for designing the project[1].

The concept is concerned with the economic and social aspects of the project, as opposed to the technical aspects[16]. Many projects are troubled by not having a concept development phase, being decided up front, without studying or assessing different alternatives, including the zero alternative, which consists in continuing as before, with no major investment but with adjustments necessary to make it feasible.

Professionals are commonly occupied with "doing the projects right", but the matter should be taken one step back, with actually "doing the right projects"[17]. The latter is agreeing about what the purpose of the project is in the first place and choosing a conceptual solution that serves the purpose well.

The choice of the appropriate projects requires an effective front-end project governance process to meet the expectations of key stakeholders. Because of this, it becomes very important to establish a project governance model that would facilitate decision-makers to anticipate, understand and act around the consequences of their choices and decisions[18,19].

The front-end phase of a project goes from the time initial concepts are conceived until funds are appropriated to the project. Concept development starts out with an overall analysis of needs, problems and requirements to identify the most feasible project strategy, the project's main features and its objectives. This process aims to identify the overall generic concept and the different concept alternatives that should be considered. The concern is essentially on the purpose and on how well it will be served by the outputs of the project[1].

Project stakeholders are individuals, groups and organizations who are actively involved in the project, or whose interests may be positively or negatively affected because of project execution or project completion[1]. The key direct stakeholders are the commissioner, the contractor and the users. The different stakeholder perspectives can be associated with the three different levels of planning: strategic, tactical and operational[4]. A strategic plan is a high-level view of the organization, its vision, objectives and value. It is the foundational basis of the organization and will dictate decisions in the long-term. The tactical plan describes the tactics the organization plans to use to achieve the ambitions outlined in the strategic plan. The operational plan describes the day-to-day running of an organization. It charts out a roadmap to achieve the tactical goals within a realistic timeframe[20].

OECD has established five evaluation criteria for development interventions[3], which, translated to projects, can be defined as[1]:

- Efficiency: the degree to which project outputs have been delivered as planned and in accordance with budget.
- Effectiveness: the extent to which the objective has been achieved.
- Impact: all other positive and negative changes and effects of the project, both in the short and the long term.
- Relevance: whether the objectives are aligned with needs and priorities of users and the society.
- Sustainability: whether the positive effects of the project will be sustained after the project has been concluded.

The most important reasons for lack of relevance are: user needs are unknown, misunderstood or ignored, and project objectives are unknown or misunderstood. The most important reasons for lack of sustainability are: lack of commitment to the project from key stakeholders, conflict over objectives and/or strategies concerning the project, low economic and financial benefits compared to operational costs, and business or other conditions changing between concept stage and final delivery[21].

The Concept Programme defines a project model, also known as quality assurance scheme, as a standard classification of project phases with specific decision points and corresponding documentation requirements. The decisions are made at critical stages, and a project cannot proceed to its next phase until it has received "green light" to go ahead. This is a general model for all major projects in several sectors to ensure good governance at a higher level. The scheme is meant to strengthen the professional quality of decision documents upfront by introducing the decision points, also known as decision gates[22].

3. Methodology

The results provided in this study were obtained by studying three sources. First, a review of available literature was conducted, finding relevant concepts and definitions, as well as documentation about the quality assurance schemes of Norway and United Kingdom. Second, legislation and official documents from the Costa Rican government were revised to fully understand the model. Finally, ten interviews were conducted with Costa Rican senior public officials.

Addressing the literature review, including collecting different books and articles, was conducted using a scoping review[23]. The literature search process[24] began using starting key words such as "quality assurance" or "project appraisal", which initially led to an unmanageable amount of results. The key words were modified to obtain more relevant results and the titles could be screened and filtered, in accordance to their abstract mainly. Oria, the academic library in Norway, was the search engine used, due to the previous knowledge of the research done around the topic, and mainly because one of the models studied is the Norwegian. Other search engines were Google Scholar and Scopus. The final key words used included "quality assurance scheme", "investment projects" and "front-end project governance", written according to the website's search functions and algorithms.

The search for official documentation was not complicated, since all the necessary documents are open to the public in the Ministries' websites and easy to obtain. The guides and supporting laws were mainly obtained from the Ministry of Planning, which is the institute responsible for carrying out the quality assurance process in Costa Rica. In total, there were 8 official documents revised, including guides, laws and executive orders, to understand the model from a theoretical stand.

The last source of information was obtained through 10 semi-structured interviews with Costa Rican authorities to fully understand the functioning of the project model. They were prolonged case study interviews[25] for about 2 hours each, with people working in different institutions within the Costa Rican government, who are directly related with the formulation, approval or financing of public investment projects. These interviews include a protocol and a format in accordance to the General Interview Guide Approach[26]. This kind of interviews have the particularity of being more structured than the informal interview, but with flexibility in their compositions. That way, the questions and the conversation may change a little while the interview develops, although a general path must be followed throughout the meeting.

The limitations encountered throughout the process were time, which leads to the impossibility of reaching out all the desired people to interview. Another limitation is that the study is conducted from Norway, which makes communication less efficient.

4. Main differences between the Norwegian, British and Costa Rican schemes

Table 1 shows the main characteristics of the quality assurance schemes in Norway, United Kingdom and Costa Rica. The differences and similarities are presented in each of the main criteria identifying each scheme. Different institutions between each scheme are responsible for starting the process and the decision on the budget. The quality assurance in Norway is performed by private external consultants, while in the UK and Costa Rica they are performed by officials within the government. The decision on the budget is approved by the Parliament in Norway and Treasury in the UK, but in Costa Rica it depends entirely on the institution and the kind of financing for the project. Norway has an established threshold value for the projects who enter the scheme, while UK and Costa Rica do not have it specified. Within the scheme, the Parliament in Norway will always take the final decision, while in UK and Costa Rica, it is not as necessary to have approval from the Parliament or Congress.

Table 1. Differences and similarities between the Norwegian, British and Costa Rican models[2]

Criteria	Norway	United Kingdom	Costa Rica
Responsible of starting the process	Ministry of Finance	Agency under the Cabinet Office	Institutions within the Government
Decision on the budget	Parliament	Treasury	Depending on the financing system
Sectors included	All, with some exceptions	All sectors	All sectors
Threshold value	750 million kroner	Those projects considered "large"	No
Performer of quality assurance	External consultants	Independent quality assurance	Ministry of Planning and Ministry of Finance
Approval in every stage	No	Yes	No
Parliament or Congress involved in decision making	Yes	On exceptional projects	Depending on the financing system
Consideration of alternatives (including zero-alt)	Yes	Yes	Yes

Approval by the Ministry of Finance	Yes	Yes	Depending on the financing system

5. Aspects considered in the choice of concept in the Costa Rican scheme

Table 2. Aspects considered in the choice of concept in the Costa Rican scheme[27]

Aspect	Characteristics
Identification	Problem identified, Optimization of zero alternative, Alternatives, Project objectives, Expected results, Adjustment to development plans, Influence area, Beneficiaries
Market	Market conceptualization, Characteristics of goods and services, Objective population, Demand and supply estimation, Prices and rates analysis, Commercialization channels, Information and divulgation strategies
Technical	Geographic location, Size, Technologies, Engineering, Opinion of the community about the technical proposal, Social responsibility
Disaster risk	Siting of the location, Vulnerabilities identification, Quantification of risk to disasters, Risk reduction alternatives, Cost and benefits from mitigation of risks
Environmental	Evaluation of environmental impact, Corrective/compensatory measures and their costs
Legal	Adjustment to current legal norms, Characteristics of the legal framework
Administrative	Organization and administrative structure, Planning and programming of the execution, Evaluation of institutional risks
Financial	Costs (investment and operation), Income, Budgetary aspects (financing, interest rate, amortization period, depreciation), Financial analysis (MARR, financial flow, NPV, IRR, C/B ratio, Sensitivity analysis, Optimal time to invest)
Socioeconomic	SDR, cost flow, PVC, EAC, ENPV, EIRR, B/C ratio, Cost-Effectiveness ratio, social price of workforce, social price of goods, Macroeconomic impacts (distributive and employment impact)

Table 2 presents the criteria considered for the choice of concept of a project in Costa Rica, showing all the requirements to be fulfilled before the project is approved by the Ministry of Planning. The evaluation performed by the Ministry of Planning is mainly a check of the presence of the requirements, since it is responsibility of the institutions' leaders to ensure a correct choice of concept by considering all these criteria, instead of a team from the Ministry of Planning evaluating the different criteria.

6. Different forms of financing projects in the Costa Rican model

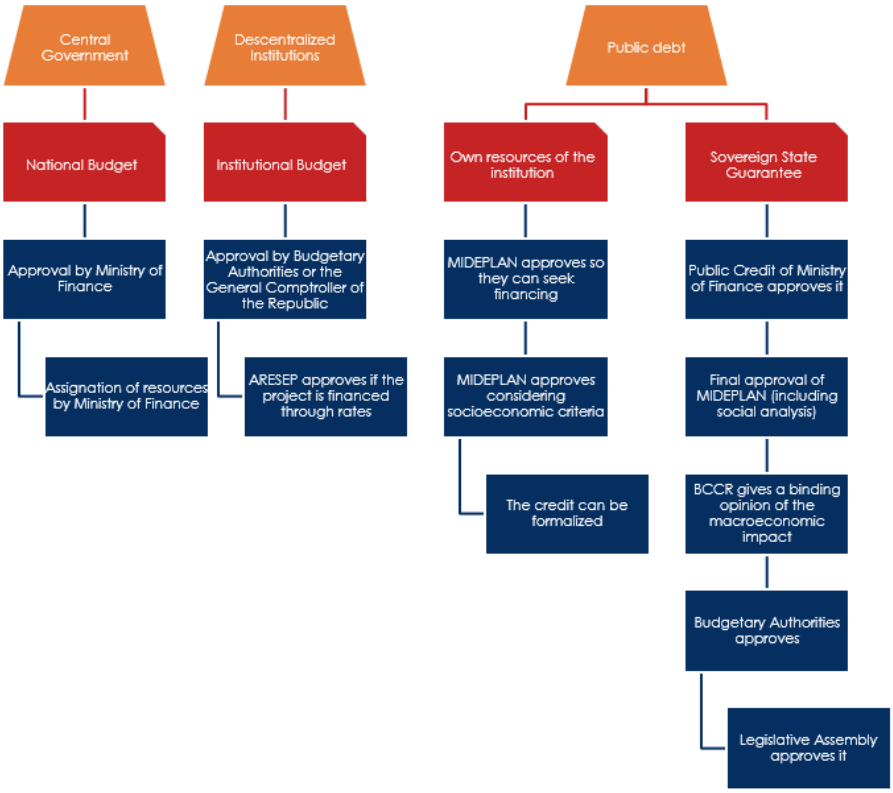

Fig. 1. Different forms of financing public investment projects in Costa Rica

Figure 1 shows the different forms of financing projects, depending on the type of institution or if the project requires financing through external loans, which leads to public debt. If the project does not require public debt, the financing is approved either by the Ministry of Finance, in the case of projects within the Central Government, or the Budgetary Authorities or the General Comptroller, in the case of decentralized institutions. If the project is financed through rates, for example tolls, the Regulatory Authority for Public Services (ARESEP) needs to approve the rates.

When the project requires public debt, there are two options: the first one is that the institution gets into debt, because it has the capacity to cover it. In this scenario, the Ministry of Planning (MIDEPLAN) approves the financing by considering socioeconomic criteria (see Table 2), and later the credit can be formalized. The other scenario is when the State must cover the debt. The Ministry of Finance becomes the guarantor of the operation, and the Department of Public Credit approves it, and then the Ministry of Planning, with a social analysis, approves for the next stage. Following comes the binding opinion of the macroeconomic impact of the project by the Central Bank (BCCR). Finally, the Budgetary Authorities and the Legislative Assembly, popularly known as Congress, approve the final budget.

7. Discussion

This paper is set out to identify 1) the main differences between the Norwegian, British and Costa Rican quality assurance schemes, 2) the aspects considered in the choice of concept in the Costa Rican scheme, and 3) the different forms of financing projects in the Costa Rican model.

The results show the differences between the quality assurance schemes between Norway, United Kingdom and Costa Rica. Norway has established a more simplistic model, with only two decision gates. The United Kingdom has a more complex system, and Costa Rica resembles this one in some factors, and it is especially evident when the project requires public debt, which creates many decision gates and approval from different institutions. Both the Costa Rican and the British schemes have people within the government to quality assure their own projects. Norway hires external quality assurers, which guarantees transparency in the decisions, not

being influenced by political pressures, at least theoretically. In Norway, the Parliament is involved in the final decision of all the projects within the scheme, but in the other two countries, the involvement of Parliament or Congress is only required on exceptional cases. However, although due to its economic status, Costa Rica has been carrying out several projects with external funding, which makes the Congress be present in many decisions regarding projects, and that may lead to delays because of political reasons.

The different criteria considered for the choice of concept of projects in Costa Rica shows the government's efforts to establish a systematic scheme which can ensure quality in the decision-making process during the front-end phase, adjusting to the statements of the National Plan for Development[28]. However, the state project model has only been recently implemented and changing the mind of public officials who have worked for a long time without a proper scheme has proved to be very challenging. Through the interviews, it became evident that the system is not yet completely working as it is described on the theory and there are legal loopholes that weaken the power of the Ministry of Planning on its function of being the main responsible for the quality assurance scheme. Nevertheless, the institutions have been improving their planning departments by gradually employing capable professionals who have been trained to manage projects in a proper way. In addition, the National Plan for Development is changed every 4 years when the government changes, and there is no guarantee on a continuity of the government plans.

The source of financing projects in Costa Rica varies significantly depending on the institution which is proposing the project. The Ministry of Finance only approves around 34% of the national budget and the General Comptroller of the Republic approves the remaining 66%. Handling public funds this way has created some astonishment in different parts of the world because of its uncommonness. This means that there are two institutions, and sometimes three or four in exceptional cases, which approve and allocate the resources for public investment projects. This can become a problem if the decisions are not being taken homogenously. The system becomes even more complex when public debt is required, which is understandable because of the economic impact the project may have on the country's economy, both in macro and micro levels. Having so many decision stages slows down the process, which can lead to cost overruns. The main issue detected is that a big percentage of projects are being funded by external loans, with international organizations having a direct influence on the project. This situation may lead to prioritize projects which are not so necessary for the country now.

In addition, there is not an external framework for decisions on funds allocation. International experience has shown that this is very important for an appropriate financing of public investment projects, since decisions will not be affected by political influences. Using a framework guarantees that decisions will be taken considering social and environmental criteria and not only economic reasons. Besides, the framework for budgeting will be of public knowledge, which guarantees transparency.

8. Conclusion and further work

The scheme for formulation, selection and evaluation of projects has been recently implemented in Costa Rica in an attempt to enhance the economy in the country, understanding public investment as an important tool to achieve that purpose. There are many similarities in the scheme with developed countries such as the United Kingdom and Norway, but also important differences, especially with the necessity of Costa Rica to execute projects through external loans, incurring in public debt.

The quality assurance scheme in Costa Rica, in theory, has a framework in which there are many aspects to consider in the choice of concept, aiming for a correct selection of the projects. However, in practice it has been proven to be challenging to walk away from old practices. Nevertheless, young professionals and constant training maintain the effort of moving forward towards a more robust model.

The responsibility of approving the financing public investment projects depends entirely on the type of institution proposing the project and if it requires public debt to finance it. These differences make the scheme more complex than those in developed countries, with more organizations taking part in the decision gates.

This paper presents a pilot study, which means that constant evaluations on the scheme need to be done to fully describe and understand the Costa Rican quality assurance scheme, including pointing out evident or potential strengths and flaws, compared to other schemes. Moreover, the scheme has only been recently implemented, and ex post evaluations have not been programmed yet. Therefore, only after several years can the success of the implementation of the scheme be measured. The decision framework of financing projects stands out as one of the most important areas to be studied, since this topic was out of the scope of this paper.

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Procedia Computer Science 00 (2017) 000–000

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www.elsevier.com/locate/procedia

CENTERIS - International Conference on ENTERprise Information Systems / ProjMAN - International Conference on Project MANagement / HCist - International Conference on Health and Social Care Information Systems and Technologies, CENTERIS / ProjMAN / HCist 2017, 8-10 November 2017, Barcelona, Spain

Implementing a Quality Assurance Scheme for Major Public Infrastructure Projects: The Case of Cyprus

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Abstract

This paper addresses issues concerning the implementation of a new quality assurance (QA) scheme for public infrastructure projects in Cyprus. The aim of this pilot study is to highlight these issues in order to make researchers and government officials aware of what the implementation of a structured QA scheme for public infrastructure projects entails. An initial scoping literature review was based on international literature on quality assurance schemes. This was followed by a study of official manuals and guidelines regarding the application of the new Project Selection and Appraisal framework of Cyprus. In addition, carrying out in-depth semi structured interviews resulted in the identification of implementation complications, such as difficulties in cost estimation, definition of alternatives and projects not adhering with the general strategies of the government. Furthermore, the presentation of the new quality assurance framework of Cyprus and its comparison with other established QA frameworks opens the way for further analysis. The results can provide the premise for further investigation and discussion for public institutions that are introducing new quality assurance procedures. The presentation of the Project Selection and Appraisal framework of Cyprus highlights the efforts by the Government of Cyprus to improve the efficiency of public expenditure procedures.

Peer-review under responsibility of the scientific committee of the CENTERIS - International Conference on ENTERprise Information Systems / ProjMAN - International Conference on Project MANagement / HCist - International Conference on Health and Social Care Information Systems and Technologies.

Keywords: Quality assurance scheme; Public project governance; Public investment management; Project evaluation; Cyprus

1. Introduction

Quality assurance schemes are established by governments to ensure long-term sustainability and relevance of public investments.[1] Governments in developed countries have begun in recent years establishing formal requirements and frameworks to ensure appropriate public expenditure.[2] Frameworks as such improve the efficiency of public fiscal policies by reducing wasteful public spending and reallocating expenditure from lower value to higher value projects.[3] A framework for converting the strategic goals of the base organization for long

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term project success should be imbued in the project management procedures when designing and implementing projects.[4]

Situated in the eastern Mediterranean, the island of Cyprus became independent from the British empire in 1960, and thus shares many similarities in the public administration sector. Furthermore, from 1st of May 2004, it became a member of the EU and from 2008 it entered the Eurozone. With an estimated 1,2 million inhabitants and a GDP per capita of $34,400, Cyprus is considered a developed country, and the main economic sectors are tourism, financial services, shipping and real estate.[5] Corruption levels in Cyprus are considered moderate, and according to Transparency International, ranks in a 47th position amongst 176 countries with a score of 55 out of 100.[6] From the report, it is evident that corruption levels have been increasing in the last years, and from this arises the need for a more structured control of the finances of the public administration.

To address this, the government of Cyprus, introduced in 2016 a new framework for assessing the viability and affordability of projects, as early as the conceptualization phase.[7] According to it, projects above €500,000 must go through a mandatory concept appraisal, while all projects above €5,000,000 have to go through a mandatory comprehensive project appraisal. The framework sets evaluation criteria to public investment projects in terms of financial, social and environmental sustainability, but also requires an assessment of affordability. During the implementation of this new framework though, several issues came up. These issues highlight the need for improvement of the structural procedures of the process, but also the need for a change in working mentality by the public administration.

One of the main aims of this paper is to document how public infrastructure projects in Cyprus are selected for implementation and more specifically how these are quality assured, financed and governed, taking into consideration the whole life cycle of projects. Furthermore, special interest is given into the comparison of these procedures with other established frameworks of European countries to create a base for further analysis and discussion on the advantages and disadvantages of the Pre-selection and Project Appraisal framework. Finally, as it was evident from interviews conducted during the study for this pilot project, there are several issues associated with the implementation of a new public quality assurance scheme for project proposals. These are interesting, not only for the government officials in Cyprus, but also to government officials of other countries that are in the process of applying a new QA scheme to their countries. The following three questions are addressed:

- What procedures does the government of Cyprus apply to quality assure major infrastructure projects?
- What are the important differences between the framework of Cyprus, U.K., Norway and Netherlands?
- What are the most prevalent issues with implementing a new QA scheme?

2. Project governance in the public sector

Governance provides a framework for decision-making and managerial action within an organization that is based on transparency, accountability and defined roles.[8] Public governance has the responsibility to determine the policies, strategies and project implementation and operation. Governance can generally be divided in the operational, tactical and strategic level of planning.[9] At the operational level, project plans are carried out, at the tactical level, the procedures for the tactical resource deployment are developed and at the strategic level, the general strategies and policies are determined.[8,10] From a quality assurance perspective, the most important of these is the strategic.[11] It can be argued that even if a project is a success from a project managers' perspective, if it fails to serve its strategic goals and user needs, then subsequently this project is a failure.[12] Strategic level of planning should be based on the interrelations between the triple bottom line of sustainability as a holist view.[13,14] The triple bottom line represents a holistic and long-term representation of sustainability and includes the economy that is interrelated with the society, which in turn is interrelated with the environment. This long-term evaluation of the strategies and objectives based on the triple bottom line provides a sound basis for a structured quality assurance framework.[1,11]

Public investment governance is generally characterized as inefficient, both in time and cost, and inefficiencies such as weak interagency coordination, politically driven decisions, corruption and allocation of public resources are common.[15] These causes public projects, and subsequently to public sector procedures, delays and cost overruns, failure in meeting goals and objectives, poor quality, "white elephant" projects with little economic and social value or even incomplete projects.[12] The implementation of a quality assurance framework that adheres to a set of criteria is highly advised in order to avoid or minimize the effects of these shortcomings of the public sector.[11,15,16]

3. Quality assurance schemes

Several studies state the importance of the application of a structured, systematic and mandatory quality assurance schemes for public investment projects.[15,16,17] A scheme as such should take into consideration both concept and cost estimation of a proposal and should be based on a structured set of criteria. These should aim to eliminate political influence, corruption and optimism bias of the engineers, but also aim to improve intercommunication between ministries and departments, limit inefficient investments and ensure long term sustainability and relevance of an investment.[1,15] This notion is supported by the OECD which defines quality assurance as any activity that is assessing and improving the merit or the worth of a development intervention or its compliance with given standards.[18]

A quality assurance scheme should include aspects that ensure that investment scopes are serving the strategic goals of the proposing entity.[19] An evaluation should exploit existing data and knowledge to ensure long-term sustainability.[20] Furthermore, the independency of the assessors and the project proposers should be ensured and be safeguarded from political or institutional pressures. As a minimum, a conceptual assessment of a project proposal should precede a formal feasibility study, in order to screen out in an early phase white-elephant projects and set the baseline for major design elements.[15]

For a quality assurance scheme to be efficient, it is necessary that proposed projects go through an evaluation during its front-end phase. Project proposals that have their concept evaluated early in their life cycle tend to be less costly to modify to satisfy its strategic goals or terminate if the proposal is not deemed aligned with its strategic goals.[8,19,21] As OECD states, an evaluation should be systematic and objective and aim at determining relevance, efficiency, effectiveness, impact and sustainability of a proposal.[18] These evaluation criteria developed by OECD are necessary to adhere to, as it ensures the long-term success of an investment. During the front-end evaluation of a project concept, a special attention should be given to relevance and long-term sustainability, as these are detrimental in determining project success, from an early phase.[11]

3.1 Quality assurance of public investments in Cyprus

Available literature states that the public sector performance of Cyprus was ranked highly relative to new EU members and other emerging economies.[22] In addition, Cyprus ranked average in public sector efficiency. This suggests that the public sector procedures, even if they are considered decent compared to other emerging economies, have room for improvement. As part of the public administration reform that was imposed by the IMF and the European Commission in the Memorandum of Understanding, the Government of Cyprus has implemented the Project Pre-selection and Appraisal framework, to improve public investment efficiency.[10,23] As stated in a report from the European Commission in 2016, the implementation of this framework is well in progress, but it is expected to take several years until fully operational and effective.[10]

As part of the public administration reform of Cyprus, the Parliament of Cyprus has voted a legislation on Fiscal Responsibility and Budget System Law (FRBSL).[24] Per this law, new public project proposals should go through a structured procedure of assessment. This procedure is called Pre-selection and Appraisal of Public Investment Projects.[25] The main aim of it is to ensure that only relevant and long-term sustainable projects are implemented.

The European Commission had identified efficiency issues with the funding of public investment projects during the initial assessment of the economic assessment of the economy of Cyprus in 2012.[23] FRBSL, and subsequently the new project assessment procedure, was imposed by the International Monetary Fund (IMF) and the European Stability Mechanism (ESM) in the Memorandum of Understanding signed for the bailout of Cyprus during the economic crisis of 2012 in order to ameliorate these issues.[26,27] In coordination with the World Bank, the Directorate General for European Programmes, Coordination and Development[7] (table 2),which is the former Planning Office for the government of Cyprus, developed a Manual for the appraisal of Public Investment Projects.[25] The assessment framework run in a pilot phase in selected ministries during 2016 and from January 2017, it was expanded to include all the ministries, excluding the Defense ministry.

As Cyprus was enjoying a relatively good economic development for several years, researchers did not emphasize on the study of issues such as public investment efficiency. Furthermore, international literature focuses more on the structure of a quality assurance framework, rather than potential issues with the implementation of such a framework. Thus, the aim of this paper is to shed light on quality assurance of public investments in Cyprus and highlight potential issues during the implementation of it, using the example of Cyprus.

4. Research methodology and limitations

The research was initiated with a literature study, with a focus on international literature on project governance and implementation of quality assurance schemes. A scoping literature review was performed, utilizing known search engines like Google Scholar and Oria.no (Norwegian online library). It was delimitated to specific articles with the use of keywords, such as quality assurance scheme, public project governance and public project appraisal.[28] Referenced articles are from the last five to ten years, since the field is still being researched and is evolving.[29]

Furthermore, a special attention was given in literature, manuals and guidelines regarding public infrastructure projects in Cyprus, their appraisal and financing by the public administration. The manual for Pre-Selection and Project Appraisal of Public Investment Projects[25], is the main document utilized to describe the procedures for quality assuring public investments in Cyprus.

In addition to the literature study, seven interviews were conducted in a qualitative approach with the main aim of gathering information that was not available through the available literature, manuals and guidelines.[30] The interviews were carried out in January 2017 and includes the directors of the two administrating offices of the QA scheme, project engineers and the intermediates between those two in the line ministries. These in-depth interviews were conducted in a semi-structured way and followed a basic interview guide formulated as a guide to a discussion.[30]

Due to the limitation in time and scope in this study, the results are considered preliminary and further investigation into the conclusions of this paper is expected to verify and investigate the initial results in depth. Also, as the new quality assurance scheme has just been put in operation, changes in the procedures of it are expected, which can result in making some of the study's conclusions obsolete.

5. Pre-selection and Project Appraisal of Public Infrastructure Projects in Cyprus

According to the Manual for Pre-Selection and Appraisal of Public Investment Projects all projects with an expected cost over €500,000 must go through a mandatory concept appraisal, while all projects above €5,000,000 have to go through a mandatory feasibility study in addition.[7,25] The responsible entities that are performing quality assurance on new project proposals are the Directorate General for European Programmes, Coordination and Development (DG EPCD) and the Budget Directorate of the Ministry of Finance (MoF BD) (figure 1). The DG EPCD is an independent governmental agency with the expanded role of administrating the Pre-Selection and Project Appraisal framework.[7] It performs assessments on economic viability and assures that the strategic goals of the government are adhered. The MoF BD, as part of the Ministry of Finance, is responsible for the preparation of the National Budget of the country. Their responsibility is extended to evaluating the affordability of project proposals.

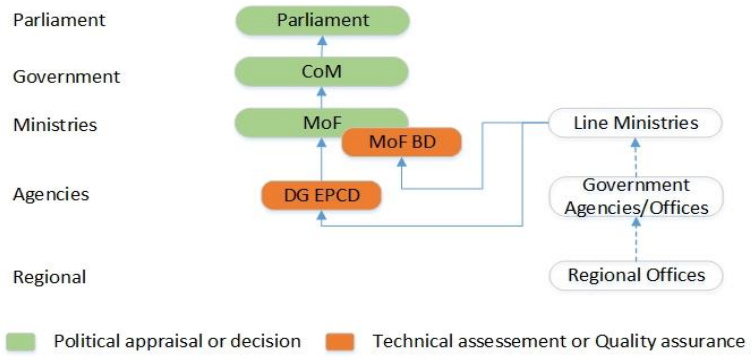

Fig. 1: Simplified governance regime for public investment projects in Cyprus

The Pre-selection and Project Appraisal framework is divided in six distinct phases (figure 2). Quality assurance of projects is concerned with the first three phases of the framework and include assessment of the project's concept and a comprehensive project appraisal.

- Pre-Selection: Preparation of a Project Concept Note (PCN), which is a spreadsheet with a set of questions regarding, project rationale, strategic case, initial cost and benefit estimations, alternative solutions and sustainability issues. The PCN is submitted by the proposing economic entity to both the DG EPCD and the MoF BD to assess the economic viability and affordability of the project respectively. The Council of Ministers (CoM) makes a formal decision on inclusion to accepted projects list.
- Project appraisal: A comprehensive project appraisal is prepared by the proposing economic entity and together with an Environmental Impact Assessment, is sent to the DG EPCD and MoF BD for economic and affordability assessment. The comprehensive project proposal includes the definition of the project proposal, a comprehensive economic analysis and a comprehensive project appraisal on affordability and sustainability.
- Project Selection: The Council of Minister (CoM) makes a formal decision for inclusion of a project in the yearly Budget proposal and the Parliament of Cyprus makes the decision for financing by accepting the Budget proposal.

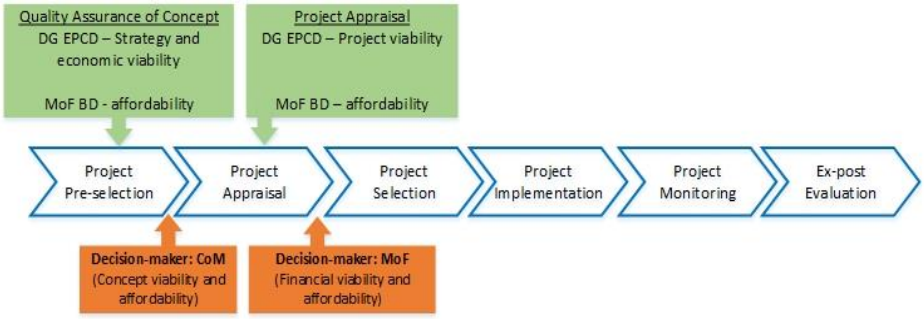

Fig. 2: Public project model in Cyprus.

The project appraisal phase is based on several quality criteria, predefined in the Manual.[25] The most important criteria include strategic alignment with governmental goals, technical and financial feasibility, realistic cost estimations, that social and environmental impacts are acceptable and operation management is satisfactory. For a project to be selected for financing, it should satisfy all the criteria set in the Manual. A special attention is given though to the economic aspects of a project and its long-term economic sustainability. Social and environmental criteria are considered, but their significance do not hold as much gravity as the economic. Specifically, at the project selection phase, the Parliament does not require a documentation of the projects in the Budget and is only requested for selected projects.

5.1 Comparison of the QA scheme of Cyprus with other countries

A comparison with established frameworks of other European countries serves in identifying the differences between them and provides the ground for further analysis and discussion. Table 2 is based on a previous comparison performed by Concept report nr.47.[2]

Table 1. Comparison of the quality assurance scheme of Cyprus with other countries.[2]

Responsible entity	Cyprus	Norway	United Kingdom	Netherlands
Applicable sectors	All, except Ministry of Defense	All, except Oil sector, Health and State enterprises	All	Infrastructure projects
QA scheme administrator	DG EPCD	Ministry of Finance	IPA	Designated gov. agency
Concept appraisal	DG EPCD	Government	HM Treasury	Designated gov. agency
Socio-economic appraisal	DG EPCD	Agency or ministry	Agency or ministry	Designated gov. agency
Decision to Finance	Parliament	Parliament	HM Treasury	Government
Quality assurer	DG EPCD and MoF BD	External consultant	Independent quality assurer	Designated gov. agency
Threshold value	€500k - concept appraisal €5 mill – feasibility appraisal	NOK 750 mill.	Depends on size	No

5.2 Issues with the implementation of the QA scheme

Through the interviews, several issues regarding the implementation of the new QA scheme were identified. These were split into two general categories, structural change and change in working mentality. Structural change is defined as the change in regulations, laws and organizational structure. Change in mentality is defined as the need for decision makers and engineers to adapt to the new mentality and work procedures the QA scheme brings with it. The most recurring and important issues are presented in table 2.

Table 2. Categorization of important issues with the implementation of the Pre-selection and Project Appraisal framework

Structural Change	Change in Working Mentality
The process can be easily affected by political pressures	More focus on economic criteria than social or environmental
The Parliament does not require documentation for projects in the Budget	Alternatives are not considered in depth
Projects proposals not ranked according to their NPV – projects with low NPV might be prioritized in front of better ones	Initial cost estimations are done superficially, still following the old way of promoting projects
Projects alternatives are not required to include fundamentally different solutions	Life cycle analysis on costs and benefits not taken seriously
Affordability assessment is performed on a case to case basis	Decision makers and engineers are prone to political pressure
Lack of expertise in evaluation agencies	Risk management and mitigation are not considered in depth
Lack of finished project database to compare with new proposals	Members of the Parliament should be more critical to project proposals – request more documentation

6. Discussion

Documenting the procedures the government of Cyprus is applying in order to quality assure new public infrastructure projects, provides a basis for comparing the case of Cyprus with established QA frameworks of other European countries. The two-step quality assurance structure resembles the QA scheme of Norway and provides decision makers with a straightforward procedure to adhere to. Furthermore, the establishment of the independent office DG EPCD as an administrator of the framework bears resemblance to that of the United Kingdom, which the Infrastructure and Projects Authority administrates. Frameworks from the other countries though, do not have a specific agency with the responsibility of administrating it and the responsibility lies with the Ministry of Finance.

As seen in table 2, the United Kingdom's framework is far more complicated and demanding than all the other, with several decision points and project assessment phases. Frameworks as such, need time to develop and be efficient. Furthermore, these can be bureaucratic and time demanding, creating a time lag between the conceptualization of a project proposal and the decision to finance, which in turn can cause a proposal to be obsolete or need rework to suit its initial purpose. The framework of Cyprus, similarly to the Norwegian and Dutch, is simpler in terms of assessment phases and is designed to minimize bureaucracy. Therefore, by applying a simple structured procedure, the public administration of Cyprus can get better control of the procedures and reduce delays and cost overruns in state initiated projects.[15] By having less quality assurance procedures though, increases the possibilities of irrelevant and non-sustainable projects to be financed, as the time between assessment and actual implementation of public projects may take up to several years. In the case of Cyprus, quality assurance of both concept and feasibility, is divided in two separate agencies, which focuses issues like sustainability and affordability to be more thoroughly scrutinized and assessed.

The Pre-selection and Project Appraisal framework, even if it is administered by an independent agency, can be prone to political pressures and influences. Final decisions on project viability and financing lies with the Council of Ministers and the Parliament, respectively, and these entities have the power to override the evaluations of the assessing agencies to promote their own agendas. This drawback of the scheme is evident in the other countries' schemes too, as the decision for financing lies with either the Parliament or the Government, except in the UK, which is the HM Treasury's responsibility.

6.1 Implementation issues with a new QA scheme

A proper evaluation of public project proposals should be based on long-term sustainability and relevance towards the government's strategic goals, following the three pillars of sustainability, society, environment and

economy.[1,13] In the case of Cyprus though, the process has still remnants of the previous economocentric evaluation, which partly overlooks social and environmental aspects. Furthermore, the fact that costs and benefits are not allocated accurately when considering the life cycle of a proposal, or the lack of estimations for benefits, makes the evaluation of economic sustainability and affordability inaccurate. These issues constitute the need for the public administration in Cyprus to change its working mentality to a more holistic view and take into consideration a wider perspective when evaluating and financing projects.

As the implementation of the new framework is at its early phases, structural and procedural issues are expected. Issues such as lack of expertise in evaluation and lack of a project database for comparisons will be solved over time. Other issues such as political pressures and enabling financing decisions by the Parliament without consideration of the proposals, are weaknesses of the new framework that need to be addressed by creating formal requirements in the process.

7. Conclusion

The Pre-Selection and Project Appraisal framework of Cyprus was developed by the government of Cyprus in cooperation with the World Bank, based on good international practice. This is reflected in the similarities with other established frameworks. Two independent agencies enact as the quality assurers for new project proposals and the Council of Ministers and Parliament have the power to accept and finance these. A low threshold for project proposals ensures that most projects go through the framework, which safeguards the procedure from financing costly or irrelevant projects. This low threshold though, can affect the process by making it too bureaucratic, which can result in an inefficient procedure.

Issues such as lack of expertise and scarcity of background information can be resolved over time. On the other hand, issues such as being prone to political pressures and a mentality of proposing projects without proper analyses are important to be resolved through formal requirements and regulations. What is important is for the public sector to learn from these shortcomings to be able to make changes to improve its efficiency. This can be achieved by acknowledging mistakes and failings and improve on them. Working mentality has to change and the new structural procedures have to be established and adjusted with the realities of Cyprus.

This pilot study focused only on the issues regarding the change in regulations, laws and organizational structure and the difficulties the public administration sector has in changing the way they are doing things. Further research on project proposals and interviews with the administrators of the QA scheme is needed to identify other aspects that can affect the effectiveness of the new quality assurance scheme. In addition, the presentation of the Pre-Selection and Project Appraisal framework is theoretical in nature, as it has just been put in operation. A continuous evaluation of the efficiency of the new Pre-selection and Appraisal framework is advised by evaluating completed projects that have gone through the scheme. This will provide the ground for improvements of the procedures and methodologies used by the Government of Cyprus.

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C. Norwegian scheme

Based on the project model explained in section 3.7, this one is a very simple model with only two decision gates. The idea of the model is to not introduce any specific changes in the procedures of ministries and agencies, allowing them to work as they have been doing lately. Nevertheless, some stricter requirements have been implemented regarding documentation, with the intention to assure quality and the comprehensiveness of analyses. Another important requirement is to take into consideration the zero alternative, in order to counteract the tendency to path dependency, a common problem identified in many of the carried out projects.

The real new proposition about the scheme is that the documents prepared by the agencies or the ministries have to be quality assured by external advisors before being submitted for appraisal at the political level.

The principle of the scheme goes as follows (fig. C.1):

- Individual ministries are the ones responsible for new investment initiatives, which are mostly analyzed and implemented by a subordinate agency. If the project has a presumed budget of over 750 million NOK (around $90 million), it must be submitted to said scheme.
- The ministry has to submit its analysis and the quality assurance report to the Ministry of Finance, to be submitted to the Government for political appraisal before it is presented to the Parliament. This involves two stages
- The first stage is about the actual choice of the concept. It starts with the agency's evaluation, also called Conceptual Appraisal (CA), while the independent assessment of the document is called quality assurance of the choice of concept (QA1).
- The second stage requires to prepare the Overall Strategy Document, which provides information on objectives, budget, target cost, implementation strategy, contract strategy, etc. This document is submitted to external quality assurance of the cost estimate and management documentation (QA2).
- Both documents will be submitted to the Ministry of Finance, to later transfer it to the Government, with special attention to the proposed budget.
- The Parliament will receive the document and make the final decision about the project, which can be stipulating the target cost or rejecting the project.

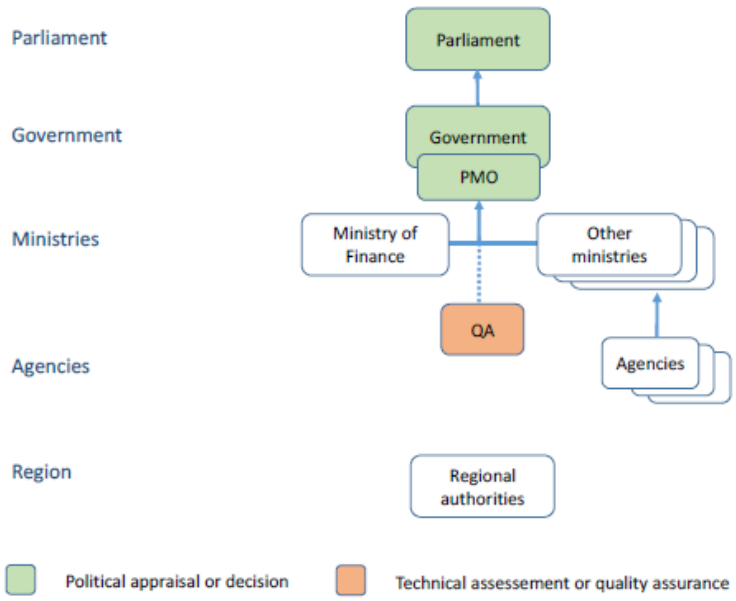

Figure C. 1. Investment Project Governance in Norway (Samset et al., 2016)

Quality assurance in Norway is, as seen from above, external and decisions are made at the highest level by the Government and the Parliament.

The Norwegian Project Model, following the general definition for it (Samset et al., 2016), is rather simple, with only two decision points with the required document attached, which reflects that it is an overarching model introduced by the wider society. It is important to mention that it only applies to the front-end phase, not the implementation of the project (fig. C.2).

The Quality Assurance of the Choice of Concept and the Quality Assurance of the Cost Estimate and Management Documentation (QA1 and QA2) are explained in detailed by the Concept Research Programme (Samset et al., 2016) and can be found in the Attachments.

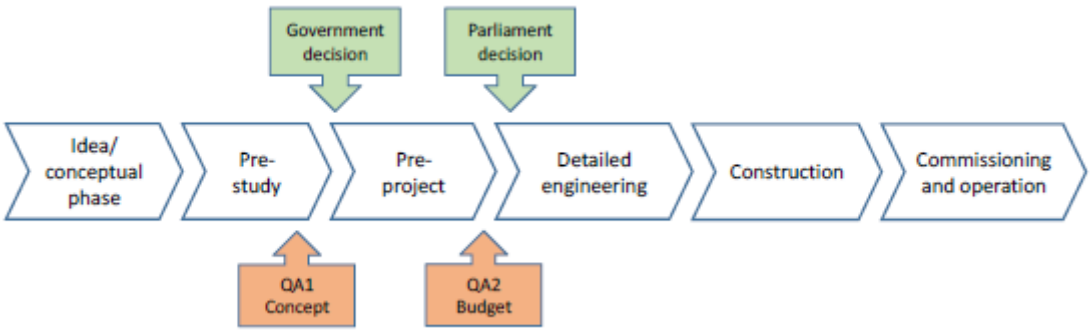

Figure C. 2. The Norwegian Project Model (Samset et al., 2016)

D. British scheme

The United Kingdom has a scheme of mandatory quality assurance at important gates between project phases, similar to the general project model described beforehand. There is a joint ownership of the scheme between HM Treasury and the Cabinet Office (the Ministry of Finance and the UK Office of the Prime Minister). The scheme is managed by the Infrastructure and Projects Authority (IPA) (fig. D.1).

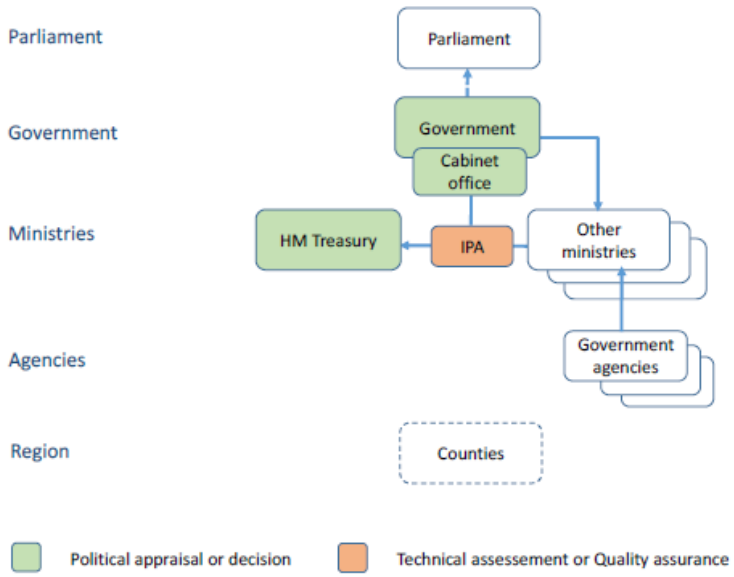

Figure D. 1. Public Investment Project Parties and Roles in the United Kingdom (Samset et al., 2016)

The Cabinet Office receives a copy of all quality assurance reports, which are direct responsibility of each ministry. The main intention of the scheme is to provide a better basis for assessing whether projects should be continued through the various decision gates.

Internally within the Government, the Chancellor of the Exchequer (Minister for Finance) has enough control over the resource allocation. The other ministries also have extensive independence in their fields, but if a project or initiative requires funds on top of the already allocated, it needs to have approval by HM Treasury.

The IPA has the mandate of ensuring independent quality assurance of the largest projects, as well as to report on, support and develop expertise in the management of large projects within the public sector. Its key duty is to manage the quality assurance scheme. This institution is also

responsible for gathering and publishing data on the projects in the Government Major Projects Portfolio (GMPP). Each year, it publishes an assessment of the projects in the GMPP in color-coded form and reports on challenges.

The reasoning behind this methodology is to enhance a disciplining effect through transparency, but also giving tools to the ministries and HM Treasury to make choices based on what are the best options for the portfolio as a whole. The IPA also has to assist with the development of project and programme management capacity in the public administration.

The project governance scheme for the United Kingdom is based on the stage-gate model, this time with four phases: policy formulation, project initiation, implementation, and commissioning and operation. Figure D.2 illustrates it, with the IPA's quality assurance at the bottom and HM Treasury's approval at the top.

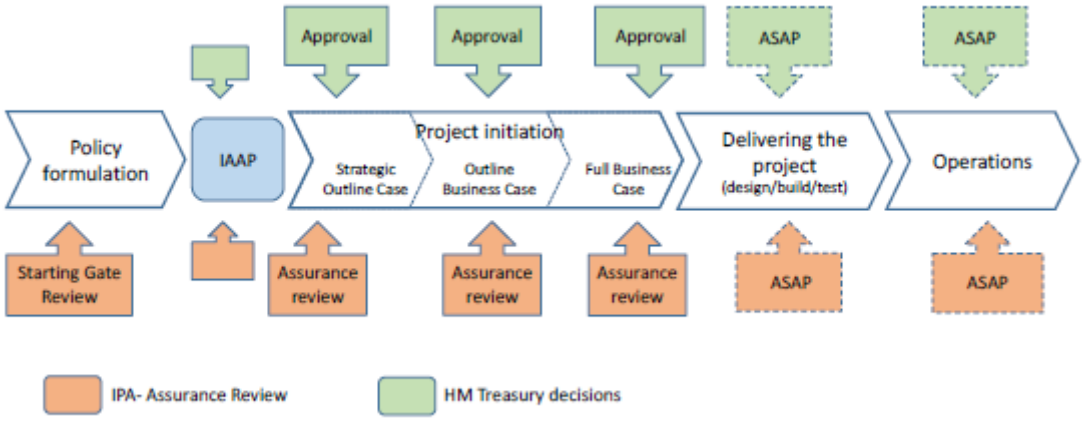

Figure D. 2. The Stage-Gate Model in the United Kingdom (Samset et al., 2016)

The main elements of the scheme are the Starting Gate, the Integrated Assurance and Approval Plan (IAAP) and the Business Case.

- Starting Gate: it is focused on checking whether an initiative is in line with the priorities of the Government, is viable and does not contain unnecessary risk.
- IAAP: a plan for quality assurance and decision points has to be prepared in advance, and it is intended to support the project owner to successfully conclude the project. It must be approved by the IPA and HM Treasury.

- Business Case: it has a minimum requirement of three quality assurance points in the front-end phase, based on the three versions of the Business Case. These reports create the basis for HM Treasury's continuation decisions. When the Full Business Case is approved, the project may initiate the closure of contracts and spend money. There should also be at least one quality assurance point in the implementation phase and one after commissioning, in line with the five key components: strategic, economic, commercial, financial and management.

The Business Case is a summary of the findings from the analyses and appraisals made of an investment at a specific point in time. It is developed over time in an iterative process, in which additional details are added along the way, with the weight of each of the five dimensions changing as it develops. The HM Treasury approval process involves the following three stages (fig. D.3):

- Strategic Outline Case (SOC): the focus is primarily on strategic and economic issues, as well as selection of level of ambition. Its purpose is to reduce the solution to three or four alternatives.
- Outline Business Case (OBC): it involves a more detailed analysis of the alternatives selected, with a view to recommending a concept. While economic considerations keep being key, other aspects such as structuring, implementation approach, robustness of plans, funding opportunities and contract strategy are also assessed.
- Full Business Case (FBC): it pertains to the chosen concept only. The project has to remain relevant and profitable, while also presenting implementation plans. The Full Business Case underpins the actual investment decision.

SOC has to be approved for OBC to start, and this one needs to be approved before the start of FBC.

The quality assurance scheme is carried out by a team of two or three project experts who are independent from the project. They can be internal or external consultants and they are appointed by the IPA on a case-by-case scenario. It is important to note that all ministries are independently responsible for carrying out the quality assurance scheme.

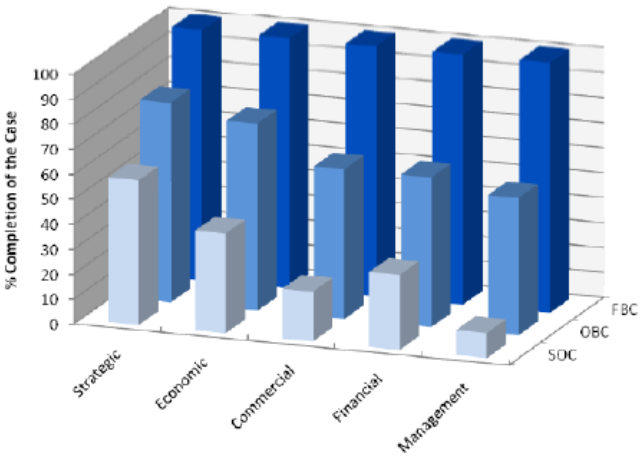

Figure D. 3. The development of the Business Case in the United Kingdom (Samset et al., 2016)

E. Technical Standards, Guidelines and Procedures for Public Investment

This document contains the layouts and procedures that the institutions will follow to ease institutional programming of public investment, budgetary programming, presentation and registration procedures for the BPIP, the role of the Secretaries of Sectoral Planning and of the UPIs, the responsibilities of the Rectories, the channeling of projects with different sources of financing, environmental aspects and the valuation of disaster risks.

There is a low capability of the institutional human resources to handle technical-methodological tools to guide the formulation, follow up and evaluation of projects. Therefore, it becomes necessary that the heads of the institutions allocate resources to the specialization and permanent training of the institutional human capital that allows the establishment of ideal conditions to have availability of the Units of Institutional Planning, with specialized personnel to ease the decision-making in the identification and execution of projects.

E.1 Requirements to register new projects into the BPIP

- The projects to register into the Bank of Public Investment Projects by the heads of the institutions, through the UPIs, must be contemplated into the Public Investment Institutional Program (PIIP), have the ex ante evaluation by the institution and present the following information requirements to the UIP:
- Official letter from the head of the institution (or the Minister), directed to the Department of Public Investments of MIDEPLAN, asking for the registration of the project into the BPIP.
- The document (both paper and digital) that includes: profile, pre- or feasibility of the project, formulated and evaluated by the Methodological Guide for Identification, Formulation and Evaluation of Public Investment Projects, belonging to the SNIP.
- The Form of Information for Public Investment Projects, which is used for the registration into the BPIP with the complete information and signed by the head of the institution and the UPI.
- The endorsement and technical approval by the correspondent Sectoral Rectory.
- Complementary information when it is necessary to justify any phase of the project. For example: reference terms of pre-investment studies or the bidding poster.

E.2 Elaboration of the PIIP

The Institutional Program of Public Investment will be formulated by the institution, establishing its medium-term investment priorities (~5 years), which needs to be approved by the Department of Public Investment (UIP) of MIDEPLAN. The projects that are included into the PIIP must be registered into the BPIP.

E.3 Responsibilities of Sectoral Rectories on Public Investment Projects

- Ensure that investment projects of the public institutions for each sector are in compliance with the stipulations of the Methodological Guide for Identification, Formulation and Evaluation of Public Investment Projects.
- Give approval and expert opinion to the public investment projects. For that, they will have the support of the Secretaries of Sectoral Planning.
- Promote and boost financing for the projects registered into the BPIP.

E.4 The role of Sectoral Secretaries

They will act as a consultant, coordinator and planning body, as a support to each Minister or Rector. Their functions are:

- Formulate, update, evaluate and follow up the Sectoral Program of Public Investment, the PNIP and the projects included into the BPIP, correspondent to the sector.
- Ease administrative processes for Rectories to approve and give expert opinion to the public investment projects, according to the methodologies and regulations established on the SNIP.
- Have an updated sectoral inventory of public investment projects, in coordination with the UPIs and the UIP of MIDEPLAN. It is recommended that the files are folded, that the coding is the same as the one in the BPIP and that they are divided by the different phases of the project's life cycle. MIDEPLAN will have complete access to the archive system of projects and could get duplicated if necessary.

- Encourage the training of sectoral human capital in formulation and evaluation of projects.
- Advise and support the Minister and the heads of institutions in the decision-making about public investment processes.

E.5 The role of the Units of Institutional Planning

They are the technical link in the strengthening processes of investment on each institution, and their functions are:

- Formulate, update, evaluate and follow up the PIIP, the PNIP and the projects into the BPIP correspondent to the institution.
- Perform, together with the Institutional Project Execution Units, the ex ante evaluation of public investment projects, in accordance to the methodologies and regulations established on the SNIP.
- Have an updated institutional inventory of the public investment projects, in coordination with the UIP of MIDEPLAN.
- Process, through the head of the institution, the registration of institutional projects to the BPIP.
- Encourage the adequate process of programming and budgeting of institutional public investment.
- Promote the training of institutional human capital on formulation and evaluation of projects.
- Advise and support the heads of the institutions in the decision-making about public investment processes.

E.6 Technical criteria from MIDEPLAN to include projects into the Bank of Public Investment Projects

It is responsibility of the Department of Public Investment (UIP) of MIDEPLAN to perform the audition and analysis of the content of the documents of the projects presented by the institutions into the BPIP, in accordance to the Methodological Guide. Once the information is received by the UIP, they will have 30 workdays to give the respective technical answer.

If the project fulfills all the requisites, then the technical answer is positive and it means the assignation of a code to the project, its inclusion into the BPIP and the following official notification to the institution, with a copy to the Sectoral Rectory.

If it does not fulfill the requisites, the technical answer becomes negative and there will be an official notification to the institution, with a copy to the Sectoral Rectory, stating the reasons of the rejection, so they can proceed, in the following 30 workdays, to perform the relevant adjustments to be considered again to be included into the BPIP.

E.7 Inclusion of investment projects into the public budgets

The institutions must fulfill the following procedures to include the investment projects into the public budget:

- Verify that each investment project to include into the budget is identified with its respective code into the BPIP and that is also included in the list published by MIDEPLAN every March 31st.
- Include the detail of the resources associated to each investment project.
- Include all the investment projects, in the Annual Matrix of Institutional Programming (MAPI) and the Annual Matrix of Sectoral and Institutional Programming, Follow up and Evaluation (MAPSESI), that require budget programming.
- Indicate the resources for the phases of operation and maintenance of public investment projects.
- Send a copy to the UIP of MIDEPLAN with the detail of the the public investment projects included in the public budget.

E.8 Verification and approval of resources allocated to investment on public budget

The final budget approval of public resources to investment projects is responsibility of the Ministry of Finance (the General Directorate of National Budget and the Technical Secretary of Budgetary Authority) and the CGR, in accordance with their power, requiring the verification that the proposed programming by the entities on the preliminary projects is in accordance with the list of projects included into the BPIP, with the institutional priorities and the PNIP. For that purpose, the opinion and approval of the MAPSESIs will be given by MIDEPLAN. The

Minister or Rector of the sector, with the support of the Sectoral Secretary, shall approve the MAPI.

E.9 Valuation of the institutional risk on public investment projects

The project must consider, during the phase of pre-investment, in accordance to the Specific System of Assessment of Institutional Risk (SEVRI), the following aspects:

- Identification and valuation of the main project processes.
- Establish the procedures to each of the identified processes.
- Evaluate the procedures in accordance to the risk portfolio.
- Define the risk magnitude and the priority level of attention to the critical activities of the project.
- Incorporate alternatives of solution and calculations, as part of the project costs.

E.10 Training of human capital on public investment

The Ministers, Sectoral Rectors and MIDEPLAN, together with the heads of the institutions, must promote and keep training and update activities for the human resource on the formulation and evaluation of projects, that encourage and favor an institutional and sectoral culture of public investment.

MIDEPLAN, as the coordinator entity of the SNIP, shall keep periodic training, related to the use of methodological guides and the instruments and techniques to formulation, evaluation and execution of public investment projects, which will lead to a knowledge network and formation of institutional trainers to strengthen the public investment culture.

The institutions shall be compromised to allocate and train the required human resources to perform the different activities, related with the processes of improvement of the quality of public investment in the fulfillment of the established functions.

F. General Methodological Guide for Identification, Formulation and Evaluation of Public Investment Projects

This guide has, as a goal, the improvement of the quality of the projects and the efficient use of public resources by the institutions. It constitutes the technical instrument defined in the "Technical Standards, Guidelines and Procedures for Public Investment" document, which eases, by its implementation, the tasks of programming and decision-making on public management for public investment, as a will to implement the SNIP (MIDEPLAN, 2010).

By using this guide, MIDEPLAN hopes to improve the quality of the projects, facilitate the decision-making in programming and budget allocation of public investment, reduce delays in bidding processes and hiring, increase the participation of the productive sector in strategic project execution and establish conditions for the follow up and evaluation of the effectiveness in the use of public resources. Besides, it will contribute to guide the processes of training of human resources required in the projects. The efforts put by the institutions in the planning, execution and evaluation of public investment projects is reflected on the drive and evolution of the projects registered in the BPIP.

The resources allocated to public investment are limited, therefore the use of them must be submitted to an analysis that allows to guarantee the best use by the institutions. This analysis of projects in the pre-investment phase (also known as front-end), corresponds to the studies of:

- Profile
- Pre-feasibility
- Feasibility
- Design

The task of identifying the feasibility and viability of the project consists in identification, formulation and evaluation of the projects, in order to select the most profitable option from the market, technical, financial, economical, social, environmental, disaster-risk and human security point of views. It is during the front-end phase where the necessary elements are present for the decision-making, related to the future execution of the project and if the investment should be done or not.

F.1 Data sheet

The study of the project must contain the data sheet, which allows to sum up the general information about the project, therefore it represents a description of the most relevant data, oriented to show its components and justify the feasibility for the execution. At least the following information is required:

- Project Name.
- Project description: what does it consist of, highlighting the main characteristics. The problem that it pretends to attack must be explained, identifying its causes and effects, as well as its objectives, the actions to be executed to solve the problem and the main components needed for the execution by the institution.
- Sector: the investment project shall be located in the institutional sector to which is vinculated.
- Geographic localization.
- Executing institution: the Institutional Executing Department shall be named, indicating its capability to execute the project, as well as if it has the conditions to take the operation phase. A description of the most important aspects of the organization should also be included, the institutional framework of the project and the way of managing the execution and operation.
- Department that created the project's document.
- Project beneficiaries: a qualitative and quantitative description of the population that will be benefited, directly and indirectly, by the project.
- Total costs and incomes of the project: the operation and maintenance phases should also be included.
- Possible sources of financing: the required financing should be stated and the different sources that were studied. If the project needs public debt, a brief description of the terms and conditions should be made, in terms of amount, time limit, interest rates, among others.
- Project schedule.
- Main restrictions and limitations: explain what are the restrictions, limitations and threats that can be present in the project, related to the phases needed according to the life cycle. The purpose is to facilitate the decision-making for promotion, negotiation, financing, execution and operation of the project.

F.2 Formulation of the Project

Under this chapter, the basic and precise information about the problem to be solved by the project is gathered, therefore it is required to identify the causes and effects of it, define and compare different alternatives of solution, as well as the chosen alternative, defining the expected objectives and results, as well as the vinculation with the policies, plans and strategies of development.

On the other side, the technical characteristics of the project are presented, including the different required analyses: market, technical, reduction of risk to disasters, environmental, legal and administrative aspects, which shall be considered as part of the pre-investment for its execution and evaluation.

F.2.1 Identification of the project

The project name should identify its nature, be simple, clear and concise, in a way that can be said in one or two lines, including the process, objective, responsible institution and geographic localization.

The background of the project refers to the precise description of:

- The motives that have generated the problem.
- The explanation of why is it responsibility of the Government to solve such problem.
- The previous initiatives proposed with similar purposes.

The problem should be described as a negative situation that affects a sector of the population and can be deducted as part of the problem trying to be solved. Once the problem is defined, the causes and effects must be identified.

An important part of the analysis is the optimization of the base situation, in which it is defined if it is possible to obtain improvements without carrying out a project from scratch, or identifying low cost measures that can improve the current situation, eliminating totally or partially the idea of a new project.

After clearly identifying the causes and effects of the problem, it becomes easier to explain the reasons why it is necessary to execute the project, which leads to define different alternatives

of solution to the problem, with the purpose of selecting the best option by considering all of them with their advantages and disadvantages.

The first alternative to evaluate is the optimization of the base situation and then the rest which were identified, to determine viability and discard those who are not feasible for different reasons, whether technical, financial, economic, legal, environmental or any other.

The general and the specific objectives must be in accordance with the problem pretended to solve and the availability of resources. The general objective comes from the selected alternative for attending the problem, and it should describe the purpose hoped to be reached with the execution of the project. The specific objectives are related with the execution and operation of the project, and they should be quantifiable, attainable, concise and derived from the general objective.

The expected results express the achievements of the project in quality and quantity, and they are built from each of the specific objectives. They must be tangible, verifiable, quantifiable and feasible in a determined period, to evaluate progress of the project.

The project must also be vinculated to the guidelines of national, sectoral, regional and local policies, such as its relationship with other plans, programs and projects implemented in the area of influence of the project. The integration of the project with the PND and the PNIP must be specified.

Determining the area of influence consists in delimiting the geographic space of the project, where the problem affects directly and indirectly the population and where the selected alternative is planned to be implemented. It is important to consider the following elements to define the area of influence:

- Geographic limits
- Socioeconomic conditions of the affected population
- Accessibility conditions

The project beneficiaries will be identified and described using an indicator or a measure unit, specifying in quantitative terms the socioeconomic conditions of the area of influence.

F.2.2 Market Analysis

The purpose of the market analysis is to measure the quantity and quality of the goods and services required to solve a determined need, easing the decision-making and reducing the associated risks. It implies quantifying the number of people who will demand a good or service that justifies the project's execution, determining the offer, as well as prices and rates to which they will be offered. The quality of the market analysis is determinant for the success or failure of a project.

In the market analysis, the main demographic, geographic, economic, social, cultural and institutional characteristics around the project must be analyzed, related to the behavior of the users or beneficiaries. The goal is to identify the needs, preferences and customs of the consumers, related to the environment, so this can adapt into attending the users.

The problem that represents the conception of the project initially allows to identify the good or service wished to be produced, but to define it with the greatest precision possible is needed, identifying its nature and characteristics. Therefore, the main substitute and complementary products (goods and services) must be taken into consideration.

After having the problem or need determined, it is needed to identify, characterize and quantify the current affected population, estimate its evolution on the coming years and define, quantitatively and qualitatively, the necessary goods and services to attend it, and this represent the first step to get to know the demand.

There are two types of population: the affected and the objective. The first one is the one that requires the services of the project to satisfy the lacking need; it can also be called lacking population. The objective population is the one that will be affected - positively - directly by the project. The characteristics of the latter shall be determined: nature, quantity, age and gender, customs, location. The ideal scenario is when the project can cover all the needs of the affected population, but for different reasons that cannot always be the case. Therefore, feasibility and priority criteria should be applied to optimize the resources and reach the maximum possible. The percentage of the population that cannot be attended will become an unsatisfied demand, and should be included in posterior projects.

The demand analysis of the good or service of a project consists on estimating, based on historical and current perspective, the quantity demanded by the consumers, to then estimate

the future behavior, taking into consideration variables that could modify the tendency and demonstrate if the project is justified.

- Historical evolution: it is not only extrapolating a tendency, but also studying the possible factors around it, like modifications on the economic policy, substitution and complementation of the use or consumption of goods, changes in the population's structure, significative modifications in volume and distribution of income, etc. The required information is usually statistics about consumption, historic growth coefficients, basic indices.
- Current situation: the most used method to obtain it is through individual consumption (per capita or family). This works better if the population is somewhat homogeneous.
- Projection: by using prediction techniques, it is possible to estimate the future demand for the life cycle of the project. The most used techniques are: variations on time series (secular trend, cyclic fluctuation, seasonal variation and irregular variation), technical coefficients (population growth, consumption or income per capita, etc.) and econometric methods.

The offer analysis is done in a similar way to the demand analysis, identifying the historical offer and determining the current and future offer.

- Historical evolution: gathering data can be done with the producers, publication or studies.
- Current situation: this offer should be in accordance to the established regulations and standards.
- Projection: the best approach is taking the competitors into consideration by asking how many of the offered good will they be offering in the future. Several factors must be considered: usage of idle capacity, plans and projects of expansion and analysis of the conditioning factors of foreseeable evolution.

After the demand and the offer have been estimated, the comparison between them will have as a result the possibility to estimate the potential unsatisfied demand of the project.

The prices of goods and services depend of the nature, characteristics and magnitude of the project. It is necessary to know the historic tendency of the variation of these prices and its future projections. If the projects finance their production based on the rates of public services,

they should be analyzed taking into consideration the rate structure and its impact on future demand. If there is no charge for the service, an analysis of unit cost per served person must be made.

The project should describe the marketing channels for the users to receive the goods or services developed by the project. These are the organizational relationships that allow to put the product between the producers, intermediaries and final users.

According to their nature, the projects need to consider and define their information and divulgation strategies to the objective population about the goods and services to be offered. The information about all the benefits is required to reach all the users.

F.2.3 Technical Analysis

The technical study allows to analyze and propose different technological options to produce the required good or service, verifying technical feasibility of each of them. Equipment, machinery and installations need to be identified, as well as size, technology, localization and engineering available.

The localization study has the goal of selecting the most convenient location for the project, starting from the area of influence, and selecting the alternative that produces the greatest benefit for the users and the community and constitutes the lowest social cost. There are, of course, many limitations which need to be considered in order to make the right decision: location of the consumers and facilities (electricity or water, for example), availability of resources, financial restrictions, land availability, environmental restrictions or risks.

The project should be subdivided into categories or thematic grouping. Each of these categories are closely related to improving the organization and easing the project execution. These components are translated into a schedule that relates activities with time and resources.

The size of the project depends on the kind of action wished to be taken, which is defined by the capacity of production on a given period. The most adequate measure is the quantity of the product by unit of time. When it is a service-oriented project, the served population, the attended people or the characteristics of the geographic area of influence will define the size.

The analysis of technology has to consider and select different alternatives of means and procedures, as well as evaluate benefits and consequences of choosing one or another technological approach. The technology of a project can be expressed as a function of the characteristics of the users, input availability, production process of goods and services, required human resources, necessary equipment, environmental impact, social effects, etcetera. The selection of technology must be justified.

The project engineering is a complementary aspect to the technological, and some points that must be included are:

- A distribution of the main activities that constitute the engineering of the project, describing the phases of execution of each component and the required input.
- The distribution of the physical space required for the operation and functioning of the project.
- Technical specifications that must be attended during the execution and operation of the project.
- Security and special requirements, which include designs that incorporate acceptable hygienic conditions and the use for people with disabilities.

It becomes fundamental to know and value the population criteria regarding the technical proposal of the project, to enhance the capabilities and support to the implementation of it, with the goal of designing solutions that can answer to the values, customs, uses and preferences of the people benefitted by the project.

The Project Executing Unit must implement certain measures that guarantee a project management that contemplates all the interest groups, taking responsibility of the consequences and impacts derived from the project, in an exercise of social responsibility.

F.2.4 Disaster Risk Analysis

This analysis has the goal of identifying the risk to disasters, facing possible threats and vulnerabilities, as well as the establishment of mitigation measures that must be assumed to reduce the risk and guarantee security, quality and sustainability of the investment in time and space, to obtain the goods and services planned with the execution of the project.

The threats of risk to disasters are classified in natural, socio-natural and endogenous (technological or complex). The process of identification of events to threats is facilitated when the causes and effects originating the project are considered. The siting of the location makes the analysis of current threats and potential risks easier, which is identifying possible dangers, events or phenomena with the possibility to provoke a disaster, starting from the selected location site and considering the area of influence.

The siting of the location gives the conditions to identify vulnerabilities of the project, which can be classified into degrees of exposure, fragility and the capacity of being resilient. These three factors are related and focused on prospective management, corrective management and reactive management.

The quantification of risk to disasters needs to be done, which is the evaluation of possible losses and damages that the project could be faced with, as a consequence of the existent vulnerabilities when the threat or danger materializes. These probabilities are related to human or material losses, infrastructure, environmental, among others.

The consideration of alternatives or measures for reduction of risk to disasters consists in the establishment of alternatives of prospective, corrective and reactive management to consider the degree of exposure and fragility, as well as increasing the resilience of the project, starting from the identification of current and potential threats according to the siting of the location and the risk factors that the project generates, with the goal of improving quality, security and life cycle. Each alternative must be submitted to a process of technical and cost analysis in order to make the decision-making easier. This mitigation measures are included into the investment and operation costs, which are fundamental to guarantee its sustainability.

According to the established alternatives, each of them will be quantified, and they will be considered, along with the other inputs, to elaborate the cash flow to perform financial, cost and socioeconomic evaluations.

F.2.5 Environmental Analysis

During the process of analysis and evaluation of environmental impact, the institutions have to identify the impacts that the project could generate on the environment, as well as the intervention measures that these impacts would require, along with their costs, which shall be submitted to financial, cost and socioeconomic evaluation. This allows to minimize mistakes

on cost estimation when the alternatives are being chosen, guaranteeing harmonization of the project with the protection of natural resources.

The methodology to identify and assess the impacts is indicated in Executive Order 32966-MINAE, where the Relevance of Environmental Impact Matrix (MIIA) is established, which is a clear summary of the effects of the projects and their significance. The Environmental National Technical Secretary (SETENA) gives the potential environmental viability (VAP) of the project during the pre-investment phase, and the studies must have the following information:

- If the project is on the profile phase, it must be categorized according to its Potential Environmental Impact (IAP) and, in case the project requires only the profile for its execution, it must present the environmental viability approved by SETENA.
- If the project is on the pre-feasibility phase, the required studies must be completed to fulfill the form to present to SETENA, which will analyze and evaluate it, to finally give a classification of Significance of Environmental Impact.
- If the project is on the feasibility phase, the documents must be submitted, where SETENA will give a conclusion on whether it accepts or not the environmental viability of the project.

The effects of environmental impacts can be positive or negative, direct or indirect, accumulative or not, reversible or irreversible, extensive or limited, among other characteristics. Environmental impacts differentiate from damages in that the former are evaluated in an ex ante process, in a way that prevention, mitigation and compensation aspects can be considered to diminish the reaching into the environment. The potentially impacting activities have to be identified for the periods of construction, operation and end of life cycle. The impacts are assessed in term of their importance, which considers nature, extension, persistency, synergy, effect, recoverability, intensity, moment, reversibility, accumulation and periodicity.

Once the impacts are assessed, the intervention measures to be implemented have to be determined, and they can be:

- Protective measures which avoid the appearance of the effect.

- Corrective measures of recoverable impacts, directed to annul, attenuate, correct or modify the actions and effects of productive processes, operation conditions, factors of the environment as a receptive agent and other parameters.
- Compensatory measures of irrecoverable and unavoidable impacts, that can compensate in a certain way the alteration of the factor (license for polluting, creation of other green areas).

The cost estimation of the intervention measures is performed according to the requirements of the environment. The investment has to consider all the costs of modifications and complementary works, as well as the costs in the operation and end of life cycle phases.

F.2.6 Legal and Administrative Analysis

These studies indicate the planning, programming of the project execution and the ideal organization that responds to the existent legal framework to carry out the project and it is applied during its execution and operation.

The project must be in accordance to the valid legal regulations and the characteristics of the legal framework related to the implementation of the project. This analysis is done to avoid future legal problems that prevent the execution of the activities.

There should also be an administrative structure, which indicates the degree of responsibility of each participant, making a summary of what it implies to execute the project, design the basic organizational structure and locate the managerial responsibility.

The process of planning and programming shall also be included, in which the activities required by each component of the project are defined according to its objectives. This should be a list of the activities and their sequence, and then allocate human resources, time and cost for each of them.

The institutional risks of the project have to be considered according to the SEVRI, which contemplate the following aspects:

- Identification and assessment of the main processes of the project.
- Establish the procedures for each of them.
- Evaluate the procedures according to the risk portfolio.

- Define the magnitude of the risks and the attention priority to the critical activities.
- Incorporate solution alternatives and the cost estimation associated to the implementation of the activities related to the SEVRI, which should be reflected in the costs, income and benefits.

F.3 Evaluation of the Project

F.3.1 Financial Evaluation

The financial analysis has the goal of studying the profitability of a project from the point of view of its financial results and evaluating the convenience of executing it.

By studying the costs, one can determine and allocate the total costs of each of the items vinculated to the project on investment and operation, during the life cycle of the project. They can be divided in investment and operation costs.

Investment costs are the resources required to, once built or finished the execution phase, leave the project functioning, and they can be qualified into fixed or tangible, deferred or intangible and work capital. Operation costs are those incurred during the operation phase to guarantee the production of goods or provision of services, and they can be classified in production costs, administrative costs and sales costs.

The project's incomes can be identified depending on how they are generated, whether by the sales of the goods or services or by the input given by public institutions, international organisms, nonprofit private organizations or the beneficiary community.

In the financing of the project, it must be specified the mode of execution and operation of the project, as well as the sources of financing. If the project requires public debt, at least three sources of financing should be identified and analyzed. The main sources of financing are: national budget, institutional or own resources, resources coming from a national or international organization, others. The modes of financing can be public debt (external or internal), public work concession, escrow, and interested management contract, another allowed by the Law of Administrative Contracting.

The finance study requires justifying the convenient interest or discount rate to use for the project. The amortization period should also be justified, which is related to the cancellation of debts that were assumed with a loan.

The depreciation of the project, understood as the loss of value suffered by the capital goods, has to be part of the financial study. They can be estimated by several methods: straight line, sum of digit years method, decreasing annual depreciation method, and others. However, the Ministry of Finance dictates the method to be used by the public institutions.

When the project generates income, different indicators should be calculated. First, the Minimum Acceptable Rate of Return (MARR) compares the present value of the incomes and expenses. To determine the MARR, the following is considered:

- The inflation rate during the life cycle of the project
- The interest rate of a non-risk investment
- The interest rate to which the institution can invest the resources with a lower risk than the project investment
- The interest rate to which the resources are obtained

The capital cost of opportunity (MARR) is the minimum acceptable profitability rate aspired by the institutions to obtain the resources destined to the investment.

The financial flow includes investment costs, operation costs and all the incomes generated to its sustainability. These should be expressed into market prices, disaggregated by year and registered in a monetary way according to the moment they were generated. The financial flow is the difference between the annual incremental costs and incomes of the project.

The Net Present Value (NPV) takes into account the current value of incomes and costs, discounted by the discount rate agreed (MARR) for the life cycle of the project. If the NPV is positive, the project is rentable; if it is equal to zero, the project is indifferent (based only on costs); and if the NPV is negative, the project is not rentable. If the project is not rentable, it is important to reject the project until after the socioeconomic evaluation has been performed.

The Internal Rate of Return (IRR) is the rate that brings to zero the NPV, or put another way, the present income is equal to the present cost. It measures the financial profitability of a project, because it compares itself against the MARR, which measures the best-desired performance. If

IRR is greater than MARR, the project is rentable; if they are the same, the project is indifferent; and if IRR is lesser than the MARR, the project is not rentable. IRR should be used together with NPV, because if there is a change in the sign of the flow (negative or positive), there may be more than one solution (more than one IRR).

The benefit-cost ratio takes into consideration all the present value of the incomes and costs during the life cycle, discounted by the MARR. It is calculated by simply dividing the benefits by the cost, hence the name. If the ratio is bigger than one, the project is rentable; if it is equal to one, the project is indifferent; and if the project is lower than one, the project is not rentable. The result of this indicator points out the performance obtained by each monetary unit invested in the project.

It is convenient to perform a sensitivity analysis of the results obtained by the evaluation of the project, because there could be a significant change that could experiment a variable without affecting the profitability of the project, indicating how sensitive is the adopted decision submitted to those changes. The indicators of the project (NPV, IRR, MARR) should be faced with this sensitivity analysis on the aspects of quantity, prices, production costs and investment.

The optimal moment to start a project is determined by the NPV, measured on different dates of possible beginning of the project. It may be convenient to start the project now or in one or several years ahead. The benefits of a project can be dependent on the year and life cycle of it; therefore, this should also be taken into consideration. It is convenient to postpone the project until the change experimented by the NPV is equal to zero.

F.3.2 Cost Analysis if the Project does not generate income

There will be public projects which do not generate income, but the social and environmental benefits are strategic for the State, therefore it is important to define the costs of investment and operation. A good example of this kind of projects is a hospital.

The Social Discount Rate (SDR) is the cost of opportunity incurred by the society when the public sector withdraws resources from the economy to finance projects. In the evaluation of public projects, the SDR is used to weigh the costs and benefits generated by a public project on a given time, with the goal of reflecting the social profitability of the project as an investment. For public projects, and after several analysis of experts, this discount rate has been set to 12%. However, there are many ways to calculate it.

The cost flow consists in measuring the opportunity to bring to the present the value of the costs of the project. These should be expressed as market prices using the SDR, disaggregated by year and registered in a monetary way according to the moment they were generated.

For this analysis, several indicators must also be calculated. The Present Value of Costs (PVC) is estimated using the cost flow, by comparing the opportunity offered by the marked about doing the investment, related to other projects, in order to establish a priority order of investments. It consists of calculating the present value of the total costs of the project, using the SDR.

The Equivalent Annual Cost (EAC) is a measure that tries to express all the costs of an equal project for a year. It is used to compare alternatives that produce the same result or benefits, but differ in their cost. It is obtained starting from the PVC.

F.3.3 Socioeconomic Evaluation

It is an analysis complementary to the financial and cost analyses, which allows incorporating criteria of social benefit and impact on the macroeconomic level. It is important that the project is not only rentable from a financial point of view, but it should also have significate benefit for the society.

In this scenario, many projects of social interest do not fulfill the minimum financial profitability, but are key to solve needs of outcast groups and maintain an adequate social balance. The socioeconomic evaluation allows prioritizing alternatives according to their social value. The following indicators must be calculated as evaluation criteria: Economic Net Present Value (ENPV), Economic Internal Rate of Return (EIRR), Benefit-Cost Ratio and Cost-Effectiveness Ratio.

For the financial evaluation, the market prices are used to estimate costs and indicators. For the socioeconomic evaluation, social prices must be used, which represent the real cost of opportunity of the goods for society. The factors that represent the difference between the market and the social prices are market imperfections and transfers, taxes and subsidies.

For the socioeconomic evaluation of the project, the following prices should be identified:

- Social price of workforce, both qualified and unqualified.

- Social price of marketable and unmarketable goods

The socioeconomic costs are divided into investment and operation costs. The first ones correspond to the adjusted investments, taking away the transferences and correcting the distortions to prices. The socioeconomic operation costs correspond to the operation costs adjusted with the elimination of transferences, just like the investment costs, and correcting the distortions to prices.

The description of socioeconomic benefits is given by the degree of welfare received by the society and it is related to the impact it has on the use of goods and services produced by the project during its life cycle. The benefits correspond to the income of the project and other economic, social and environmental benefits that can be quantifiable, and can be identified as tangible or intangible.

The socioeconomic flow is calculated by subdividing it into investment and operation items. It is calculated to non-tradable items with its economic cost based on the internal offer and demand and the distortions included in the financial prices. The market prices shall be adjusted to social prices, following these steps:

I. Identify the items corresponding to the investments and the operation costs of the project
II. Define which goods are tradable and which of them are unmarketable.
III. Perform the necessary adjustments to the tradable goods, by defining their social price and the adjustments according to the social value.
IV. Do the corresponding adjustments to non tradable goods.
V. Apply the same procedure for the income
VI. Subtract the investment and operation costs from the income, to determine if the socioeconomic flow is positive or negative.
VII. Adjust all the annual flows with the SDR and determine the ENPV and EIRR.

The same indicators as in the financial evaluation must be estimated, but using the SDR: ENPV, EIRR, Benefit-Cost Ratio, Cost-Effectiveness Ratio.

The distributive impact of a project tries to quantify what percentage of the benefits are appropriate for the low income sectors, the other private beneficiaries and the public sector. It

is about determining the use of the resources by the public sector, and how it modifies the current situation of people.

With the implementation of a project, it is necessary to contemplate the employment creation, both in the execution and the operation phases. It could be direct or indirect, and it is important to take into account to quantify the impacts of the project.

F.4 Summary

This document serves as a guideline to propose a project to MIDEPLAN and further include it into the BPIP. This requires participation from many stakeholders during the conception phase and they all should be coordinated and trained to carry out such an extensive analysis, in order to find a project that can be approved to receive public funds, and is also in accordance with the National Plan for Development.

G. How are projects handled in a decentralized institution in Costa Rica? The case of the Institute of Aqueduct and Sewage (AyA)

The following list describes, step by step, the process followed by AyA to carry out a public investment project. AyA is a decentralized institution and refers to projects that require public debt. This process is extracted from Interview 10 (see Appendix I).

1. The need is identified, whether by initiative of the institution or a command by the Executive Power.
2. The project profile is developed.
3. Basic studies are conducted: hydrogeological, geological, ground conditions, etc.
4. Feasibility studies are hired (the institution does not have the capacity to handle them itself).
5. The Board of Directors of AyA approves the project.
6. Following the SNIP, MIDEPLAN's approval is sought out to find financing.
7. Approval from the governing body (either Ministry of Health or Ministry of Environment, depending on the case).
8. Negotiations with financial entities start.
9. MIDEPLAN approves the project.
10. Financial approval by the Central Bank (BCCR)
11. The Department of Public Credit of the Ministry of Finance approves the payment capacity of the institution.
12. Sometimes an external institution is sought to get the funds faster and avoiding the procedures involving the Ministry of Finance.
13. The project is formalized.
14. After the project has been implemented, and positions are required to operate it, the assignation of those depends on the Budgetary Authorities (AP).

H. Bank of Public Investment Projects (BPIP)

It is a database of the public investment projects, independently of the investment phase they are in. The BPIP is managed by the UIP of MIDEPLAN, with the support of the UPIs, being a component of the SNIP that provides updated information in order to ease the decision-making processes about investment projects during the execution process by the public entities.

The BPIP allows to identify the main national necessities which must be translated into taking investment actions, oriented to the promotion of the formation of fixed and human capital, fundamental elements to achieve development and fulfill the needs demanded by current and future generations.

The establishment of the BPIP has allowed to know the information and identify the capabilities of programming and budgeting of investment projects by the institutions, so that the conditions for decision-making are facilitated and improved, as well as establishing the base to formulating the PNIP.

I. Interview guide

The interviews were carried out in the period between January 10th and January 23rd. In total, there were 10 interviews with public officials, one member of the Legislative Assembly and one journalist. These were semi-structured interviews, with an initial set of questions to ask, but keeping in mind that it was more a discussion than a questionnaire (Bryman, 2015). This strategy was chosen to have a more natural conversation, giving room for more honest and distended answers in a relaxed and comfortable environment.

I.1 Interview timeline

Table I.1 shows the date, institution and duration of each interview conducted in Costa Rica. The name of the institution is translated to English and then mentioned on its original name in Spanish.

I- 1. Timeline of the interviews conducted in Costa Rica with public officials and a journalist

Number	Date	Institution	Duration
1	10.01.2017	Ministry of Planning Ministerio de Planificación y Política Económica (MIDEPLAN)	93 min 09 s
2	11.01.2017	Institute of Social Welfare Instituto Mixto de Ayuda Social (IMAS)	74 min 32 s
3	12.01.2017	Ministry of Public Works and Transport Ministerio de Obras Públicas y Transportes (MOPT)	25 min 36 s
4	12.01.2017	Ministry of Public Works and Transport Ministerio de Obras Públicas y Transportes (MOPT)	41 min 23 s
5	12.01.2017	Ministry of Public Works and Transport Ministerio de Obras Públicas y Transportes (MOPT)	33 min 12 s
6	13.01.2017	Ministry of Finance Ministerio de Hacienda	92 min 25 s
7	18.01.2017	Legislative Assembly Asamblea Legislativa	45 min 14 s
8	18.01.2017	Network Channel Teletica	59 min 57 s
9	20.01.2017	Costa Rican Social Security Administration Caja Costarricense de Seguro Social (CCSS)	39 min 03 s
10	23.01.2017	Institute of Aqueducts and Sewage Instituto de Acueductos y Alcantarillado (AyA)	80 min 17 s

I.2 Interview questions

The following questions were utilized as an initial guideline to conduct the interviews. However, more questions arose during the discussion, and those questions are not reflected here. The questions were not followed in any particular order and just came up as the discussion developed. Given the nature of the institutions, which play different roles into the scheme, some questions were asked and some were not, because they were not relevant. Nevertheless, all the questions are listed.

- Why was the quality assurance scheme implemented?
- How would the scheme look if it was drawn as a sketch?
- Is it enough to follow the guidelines to register projects into the BPIP?
- How are projects selected?
- How are projects approved?
- What is the prioritization criteria?
- Is there any kind of project ranking?
- Is sustainability a decision criterion?
- What is the model missing?
- What can be improved with the way projects are being handled?
- Are cost overruns the reason for implementing the scheme?
- What are the execution problems detected?
- How is the model functioning?
- What is the role of the Legislative Assembly in the decision-making?
- How are projects adjusted to the PND?
- Does the budget in the institutions change every year?
- Is that change significant?
- Which are the strategic projects?
- How is the financing sought?
- How did the initiative for organize front-end management start?
- Who is responsible of approving projects on an institutional level?