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# **The Role of Government in Setting an Appropriate Environment for Public Infrastructure Development: A Case Study of Hydropower Development in Lao PDR**

A thesis presented in partial fulfilment of the requirements for the degree of Master of Philosophy in Development Studies at Massey University, Palmerston North, New Zealand.

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**2011**

## **ABSTRACT**

The role of government in setting an appropriate environment for public infrastructure development is explored to understand whether there are strong links between infrastructure, development and government. In examining this subject, a number of related issues are also considered, including why infrastructure is important to development, how managing resources well leads to better infrastructure outcomes and why is it essential that infrastructure is managed more effectively. Each of these leads to a better understanding of the roles government should play in infrastructure management.

The methodology is designed to develop a definition for infrastructure and understand what the literature says about the links between government, development and infrastructure. The manner in which infrastructure has been provided historically is also considered and this research supports a system of infrastructure management. The system is then investigated through a hydropower project in Laos that is examined as a qualitative case study.

The links between government, development and infrastructure are found to be strong in this thesis, but governments have had mixed involvement in infrastructure provision through the ages. At the end of the last century government is seen to have increasingly engaged with the private sector in a structured way. The core roles of government that cannot be left to others are found to include planning, procurement and regulation of infrastructure outcomes. These roles should be delivered within an overarching national infrastructure plan that is carried out by a centralised Infrastructure Management Unit.

The case study project highlights some enhancements that can be made to the system proposed in the thesis and helps explain why there are sometimes exceptions to application of the whole system, although exceptions should be limited because case-by-case project development is suboptimal to initiatives that are formed as part of a national infrastructure planning process.

## ACKNOWLEDGEMENTS

I would like to acknowledge the following people who have made contributions of various kinds to be developments of this thesis. My supervisors at Massey University in New Zealand have provided important guidance to me over the years, encouraging me at times when I might otherwise have given up and, at other times, they have simply put me through the meat grinder! First, I would like to acknowledge my first supervisor, Beth Greener. Beth stuck with me during the period where I was tackling the thesis on and “on again, off again” basis but she was eventually called off to more important things and Professor Regina Scheyvens took up the mantle from there. Regina was a tremendous support and I particularly valued her direct and helpful feedback. I would also like to acknowledge Rochelle Stewart-Withers for providing a helpful pathway toward developing my methodology.

In Laos, I would like to extend thanks to all those who took part in my discussions in Vientiane. Laos is very dear to me and I hope this thesis and its recommendations are helpful to the country and other emerging markets in some small way. Thank you also to Tania, James and Carol, my colleagues at Ridgway Capital Projects. Each of you graciously reduced your hours and time commitment to the business in order for me to focus on my studies. My sincere thanks go to my wife, Sally, and my children: Rebecca, Hamish and Matthew. Thank you for putting up with me saying “this is the year that I will complete my thesis” at the start of each year. Thank you also for the sacrifices that you have made along the way as I have focused on my studies. To Andrew Lavery, who proofed the thesis and helped with the rigour needed for good referencing, my sincere thanks.

Finally, two major earthquakes in Christchurch, where I live, have interrupted the writing of this thesis. The second of these has wreaked massive damage on the city and its infrastructure. I hope that some of what I have written finds its way into Christchurch’s reconstruction.



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## **LIST OF ABBREVIATIONS**

ADB	Asian Development Bank
AfDB	African Development Bank
BOT	Build-Operate-Transfer
CA	Concession Agreement
CAREC	Central Asia Regional Economic Cooperation
CBA	Cost-Benefit Analysis
CDF	Comprehensive Development Framework
CPI	Committee for Planning and Investment of Lao PDR
DAC	OECD Development Assistance Committee
DSM	Demand Side Management
EBRD	European Bank for Reconstruction and Development
ECA	Export Credit Agency
EdL	Electricite du Laos
EGAT	Electricity Generating Authority of Thailand
EGCO	Electricity Generating PCL
EPD	Energy Promotion Department
G8	Group of Eight
GDP	Gross Domestic Product
GNI	Gross National Income
IADB	Inter-American Development Bank
IBRD	International Bank for Reconstruction and Development, part of the World Bank Group
ICSID	International Committee for the Settlement of Investment Disputes
IDA	International Development Association
IFC	International Finance Corporation
IFRIC	International Financial Reporting Interpretations Committee
IMU	Infrastructure Management Unit
IRN	International Rivers Network
IPP	Independent Power Project
ITD	Italian-Thai Development PCL
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
LHSE	Lao Holding State Enterprise
MDGs	Millennium Development Goals
MEM	Ministry of Mines and Minerals of Lao PDR
MIGA	Multilateral Investment Guarantee Agency
MOF	Ministry of Finance

MOU	Memorandum of Understanding
MW	Megawatt
NEM	New Economic Mechanism
NEPAD	New Partnership for Africa's Development
NGO	Non Governmental Organisation
NIMBY	Not In My Back Yard
NPM	New Public Management
NPV	Net Present Value
NTPC	Nam Theun 2 Power Company
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PDA	Project Development Agreement
PFI	Private Finance Initiative
PPI	Private Participation in Infrastructure
PPIAF	Public-Private Infrastructure Advisory Facility
PPP	Public-Private Partnership
PRSP	Poverty Reduction Strategy Paper
PSC	Public Sector Comparator
PSOD	Private Sector Operations Division of the ADB
PSSS	Power Sector Policy Statement
PV	Present Value
UNCITRAL	United Nations Commission on International Trade Law
UNDP	United Nations Development Program
UNECA	United Nations Economic Commission for Africa
UNECE	United Nations Economic Commission for Europe
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNIDO	United Nations Industrial Development Organization
USD	US Dollars
VfM	Value for Money
WTO	World Trade Organization

# Chapter 1: INTRODUCTION

## 1.1 Justification for the Research

For over 20 years, I have been a financial advisor to organisations developing large-scale infrastructure and utility projects in developing countries. While my professional career started in New Zealand, I really “cut my teeth” in the infrastructure world when I started working for a merchant bank in London during the 1980s. That was followed by five years working in East Asia, a short period in Australia, and an eventual return to New Zealand in 2000. Since then, I have worked mostly for governments in developing countries and development banks helping with the upstream policy and planning aspects of infrastructure.

Planning is such an important function and one that I feel strongly about, because I have had first hand experience of project failure. For example, between 1994 and 1998 I worked on a large power project in Thailand that failed to complete its planning phase and the opportunity cost to Thailand was substantial. By comparison to the Thai experience, in 1999 I moved to Australia and worked on an even larger energy project that completed its planning phase successfully within four months. I was stunned at the differences between major project development in an emerging market, and in one that is well developed.

The contrast of the Australian experience struck me, leading me to think that one major difference between projects in developing versus developed countries is the degree and quality of upstream planning. Therefore, the proposition that I wish to examine through my thesis research is that the effectiveness of infrastructure development in developing countries depends on how effective governments are in setting policies, planning for and implementing infrastructure.

When I speak with people socially and they ask what I do, as soon as I mention “infrastructure” often there is a noticeable glazing over of their eyes. The reason why my friends’ eyes flirt with the door is because in developed countries we have come to take infrastructure for granted, yet without its quiet presence our lives would be much, much poorer for it. That quiet presence exists because over time, infrastructure, such as roads, water supplies, and electricity has been provided by publicly owned

organisations and financed through taxes imposed by central, regional, and local governments and, what is more, we have paid them.

Governments in developing countries do not have the level of financial and human resource enjoyed by their developed counterparts. This problem is only made worse because of the sheer scale of infrastructure development needed now by fast growing developing countries. For example, as much of the world's production has shifted to Asia, there has been a parallel increase in urbanisation, which has placed substantial pressure on provision of basic services in Asia's cities. This brings me to the essence of my thesis, which is that developing countries must use their limited resources especially wisely if they are to meet this infrastructure challenge.

## **1.2 Research Aims and Objectives**

Building on Section 1.1, the principal research question that my thesis addresses is: Does government have an important role to play in setting an appropriate environment for public infrastructure development? To answer this overarching question, a number of related questions also need to be answered and these are:

- Why is infrastructure important to development?
- How can managing resources well lead to better infrastructure outcomes?
- Why is it essential that infrastructure is managed more effectively and what roles do governments play in that management?

My starting perspective is that the effectiveness of infrastructure development in developing countries depends on there being an appropriate environment to attract developers and financiers, minimise the cost of finance, and arrive at a service that end users can enjoy cost-effectively. Such an environment depends on governments being effective regarding the setting of policies, planning for, and procuring and managing targeted infrastructure outcomes.

To answer these research questions, a series of objectives must be achieved. These are:

- Understanding the relationships between infrastructure, development and the role of government. This is important because it must be demonstrated that infrastructure is significant to development and that the government has a major role to play in infrastructure.



- Examining how infrastructure has been developed and operated through the ages and how this is currently organised. This is important, because to understand the current state of infrastructure provision we must contrast this with how infrastructure provision has evolved over time.
- Developing a view on good practices for infrastructure provision that draws on current thinking in infrastructure that are relevant in a development context. This will be done as part of this thesis in order to consider how well the case study project was prepared.
- Investigating the infrastructure system against an actual case study. This will provide an understanding of how well good practices were applied in that case, whether the good practices system is appropriate, and how the hypothetical system may be improved.
- Making recommendations about what interventions governments in developing countries should be making with regard to infrastructure. The resulting system should serve as a useful basis for assessing a developing country's infrastructure management and identifying the areas where improvements can be readily made.

My thesis involves an analysis of a hydropower project in Laos to assess the system against an actual case. The analysis will include policy setting, the legislation and public institutions that give effect to that policy, project planning, procurement and project monitoring. These are ingredients for success, which if not well managed will lead to ineffective social outcomes. I want to develop a deeper understanding of what governments can be doing, so their limited resources are allocated properly.

### **1.3 Outline of the Thesis Structure**

This thesis has been organised under the following chapters:

**Chapter 1** – This chapter introduces the core purpose of this research, which is to understand the role of government in setting an appropriate environment for public infrastructure development. The background to the hypothesis that government is important in this context is discussed and the chapter provides an outline of the thesis structure.

**Chapter 2** – Considers the methodology used in this thesis and the positionality of the researcher. Consideration is given to the relative merits of, and approach to, a

qualitative case study. Importantly, the Chapter foreshadows a central element of this thesis, which is to reconstruct the arguments supporting the trend towards increasing private sector involvement in the delivery of infrastructure.

**Chapter 3** – Provides a critical literature review of the linkages between the State, infrastructure and development. The chapter explores why strong relationships must exist between each of these elements as a foundation for the thesis. The evolution of development theory and the implications for infrastructure are reviewed and a definition for the commonly known, but poorly defined, term “infrastructure” is derived.

**Chapter 4** – Analyses literature on the manner in which infrastructure provision has evolved over time, and describes the current thinking governments have regarding how infrastructure is provided. This is relevant because private actors are providing infrastructure increasingly, which raises questions about the role government plays in what have traditionally been considered public services.

**Chapter 5** – Sets out a system for infrastructure management that is appropriate to developing countries. The system is based on judgements about what is best practice with some adjustments being made to account for the differences between developed and developing economies.

**Chapter 6** – Compares the system developed in Chapter 4 with a case study. The selected case study is the Nam Theun 2 hydropower project in Laos. The project is considered by many to be a gold standard by comparison to other projects, but it also leaves a mixed legacy. The tensions between the advantages and disadvantages of the project are a helpful basis for understanding the infrastructure system put forward in Chapter 5.

**Chapter 7** – Draws on the discussion of the previous chapters to arrive at a number of conclusions regarding the role of government in ensuring successful infrastructure delivery outcomes. The chapter concludes with some reflections regarding the methodology for this thesis, summarises the thesis, arrives at a range of conclusions, and makes some recommendations regarding actions that government can take to positively influence infrastructure delivery outcomes.

## Chapter 2: **METHODOLOGY AND POSITIONALITY OF THE RESEARCHER**

### **2.1 Introduction**

In reflecting on the research questions posed in the introductory chapter, this chapter seeks to articulate in detail the methodology that frames this research. As such, preparations prior to fieldwork, such as ethics, the rationale for taking a qualitative case study approach and the methods used during the fieldwork to collect and analyse the data will be discussed. In keeping with a qualitative approach to researching, consideration to my personal position as the researcher, positionality, will be reflected upon in detail.

Turning first to methodology, I make the distinction between “methodology” and “method”. The first deals with the acquisition of knowledge, how we know what we know and how we go about knowing, and the second relates to the process of research (O’Leary 2009). My interpretation of this process in the context of this thesis is to understand what the literature says about my research topic, where there is a common agreement, differences, and knowledge gaps. Added to this is an examination of a particular project through a qualitative case study, primarily because literature alone will not lead me to the best means of answering my research question. I accept then that there is not a “one size fits all” methodology that can be applied when seeking to understand the world. Hence the importance of differing methodological approaches is acknowledged and the approach taken by the researcher is very dependent on what the researcher is trying to discover, that is it is dependent on the aim of the research and the nature of the research question being posed. Moreover, because different people see the world in different ways the application of differing methodologies is acknowledged, as is the idea that there is not a single truth. That is there is no single way to acquire knowledge, and there are multiple realities and knowledges. Consequently, the analysis of literature and the case study project will be interjected with some personal judgement about how I interpret and understand the world. It is here where I must acknowledge my own subjectivity and positionality, which must be explored so that readers can “see where I am coming from”. With this in mind, the following section deals with my positionality as a researcher and then the philosophical positioning of the research.

## **2.2 Positionality**

In considering the different epistemological positions that one might take, the two that struck a particular chord with me are relativism but also social constructions. Vivien Burr (1995, p.20) tells us “We could see the person we are as the product of social encounters and relationships – that is, socially constructed”. Consequently, we are ourselves socially constructed and our reality is also socially constructed. When we describe something we give it identification. That identification is based on how we see that thing, which may be seen differently by somebody else, perhaps like colour-blindness (Burr 1995, p. 21.). Thus, the way I see things is a function of the way that my personality has been socially constructed through all the experiences and interactions I have had throughout my life. I have my own worldview, which will not be the same as the worldview held by others.

My worldview therefore has an important implication for the overall direction for this thesis. In part, this is because a central element of this thesis is to reconstruct the arguments supporting the trend towards increasing private sector involvement in the delivery of infrastructure, which traditionally has been a public sector undertaking on the basis that infrastructure services are “public services”. Rather than just restate the arguments however, I intend also to take a position, so there is an element of persuasiveness in my thesis. My philosophical position is that there is an important role for the private sector to play in infrastructure, but that the State has an equally important role to play as the referee on behalf of society. Much of this thesis therefore explores the role of government to act as that referee, and what tools it should be using to be at its most effective.

Influences that affect my positionality and are especially important to this thesis are that I have an economics background, and therefore have a bias towards economic rather than social and environmental considerations. I also see development more in terms of economic development than other modes. This is most probably because for many years I have been an infrastructure financial adviser who likes to see tangible outcomes delivered as efficiently as possible. Politically, I could be described as having a centre-right political outlook, and I tend to see the big picture, having a preference for dealing with national issues rather than dealing directly with people adversely affected by infrastructure projects. I could therefore probably be accused of being removed from affected peoples, but this is also an advantage when trying to produce outcomes that are

for the greater good. I am also a middle aged, moderately affluent, and perhaps also a physically imposing Caucasian male. This paints a certain picture, but I have also acted on the side of society by advising governments for most of my career, so am sensitive to the needs of developing countries. Overall, I accept that I bring biases, but that also brings an interest in trying to answer my research questions in a fair-minded way.

For the case study, I was the financial adviser to the Government of Lao PDR with regard to the Nam Theun 2 project. I am fortunate in having worked in Laos for a number of years, and having built up a range of relationships with important decision-makers within the electricity sector. It can be difficult to have access to these people and to obtain qualitative information (Scheyvens and Storey 2003, p. 182) but I have been fortunate in this regard. This provides me with some advantages, but it also carries some responsibility regarding ethical questions. These are explored more fully in Section 2.5.

### **2.3 Philosophical Underpinnings of the Research**

I accept both naturalism and constructivist/post-modernist views have a place in my worldview. However, as I have a financial background, I have a tendency to try and quantify things and distil them down to some numerical form. In doing that, I have come to learn that when looking for numerical inputs for a particular situation, that it is often difficult to identify a single number that is the most appropriate to apply. The reason for this is because there are actually many possibilities. The corollary in statistical modelling is the distinction between providing for single data inputs that produce a single deterministic output, versus using multiple inputs that are each assigned probabilities and, when run using Monte Carlo type simulation, lead to a single “expected” output – this is a little like naturalism versus constructivism. In short, I acknowledge that for some people there is one single reality, yet for others there are multiple realities and interpretations. When thinking about research therefore, the researcher must lean towards the methodology approach and methods of data collection and analysis that will best help them to answer the research questions that have been posed.

Thus the methodological approach for this research will be qualitative in design and involve a case study, the rationale for which I explore next.

## **2.4 Qualitative Case Study Approach**

In trying to determine the right analytical approach to the research contained in this thesis, a central question was whether the research should be primarily quantitative or qualitative. O’Leary rather helpfully quotes Albert Einstein, who told us that “not everything that can be counted counts, and not everything that counts can be counted” (O’Leary 2009, p. 256). This is meaningful because infrastructure has many dimensions that in my view cannot be reduced to numbers alone. Some of those dimensions include economic development, sustainability, poverty alleviation, human rights, globalisation, and conflicting theories of development. The big picture for this thesis is to understand why infrastructure is important, how it can be best organised and what role government plays in that organisation.

O’Leary (2009) describes the fundamental difference between qualitative and quantitative research. The first focuses more on themes, and the second more on statistics. This thesis will rely more on understanding a series of interrelated themes than trying to draw information from statistical data. That is not to say that my qualitative research will be any less rigorous than quantitative approaches, because my intention is to establish a system for government involvement in infrastructure and to then investigate that system against a particular project.

As mentioned in Section 2.2, I have selected the Nam Theun 2 hydropower project in Laos as the case study project. This is because:

- It is an infrastructure project
- It is situated in Laos which is a developing country
- The project involves renewable energy, yet it has significant opposition because of environmental concerns
- The project has a far reaching impact on Lao society
- The project involved a multitude of parties, each having their own perspective, that needed to be reconciled for the project to go ahead
- I have access to people and data relevant to the project.

In deciding on a research method for this thesis, I settled on a case study approach. Case studies are a common method in social sciences because they are well suited to dealing with an event that has many aspects not easily examined by other approaches (O'Leary 2009). Aside from being a systematic way to collect, analyse, and report on data, the case study is a helpful way of investigating an issue in detail, which is effectively the system that I have developed in Chapter 5.

Case studies are not without their detractors, because they are subjective and can be subject to the researcher's own biases. The researcher cannot control all the variables as might be achieved in a laboratory test (O'Leary 2009). The researcher therefore must rely on their interpretation and becomes part of the study as a consequence, so in qualitative research process is what counts. Overall then, the case study has its flaws but is nonetheless a means of adding to our collective experience (Stake, 1978) and, for this reason, the case study approach has merit.

The basis of information for my case study is three-fold, involving: (i) a case study on Nam Theun 2; (ii) literature about the Nam Theun 2 project, especially a book published recently that is specifically about the Nam Theun 2 project and; (iii) through discussions with a range of people that have first-hand knowledge of the project.

The case study I refer to is one that I developed for the Asian Development Bank (ADB) for a workshop in Chengdu, China in 2009. The workshop was for members of the Central Asia Regional Economic Cooperation (CAREC), who were particularly interested in understanding the attractions and pitfalls of major infrastructure public-private partnerships (PPPs). Preparation for the workshop involved development of a paper and presentation materials. In travelling to Laos and interviewing people who were involved with the project from a governmental, developer and financier viewpoint I gained insights into the project that led to published material. The purpose of the case study was to develop an understanding of why a PPP modality was chosen for the project and how effective it proved to be. This is different to my research question, but the study is still helpful because it examined the role of government in the project. Where the case study is less useful is in examining the relative merits about the project as a PPP, because I am more concerned with a whole-of-country infrastructure system.

The principal reference I have used from literature is a book entitled "Doing Dams Better: The Challenges of Lao Nam Theun 2", written by World Bank staffers Ian

Porter and Jayasankar Shivakumar (Porter and Shivakumar 2011). The book will be examined closely in order to compare the Nam Theun 2 project with my hypothetical model approach to infrastructure. As both of the authors have strong associations to the World Bank, and the World Bank was not without criticism with regard to its involvement (which is continuing) with the Nam Theun 2 project, it cannot be assumed that this book goes without bias. Therefore, to take a more holistic approach requires a review of literature, written by opponents of the project, together with other reports and papers that I will consult.

People who have written about the Nam Theun 2 project generally have a particular point of view. I am included in that number, particularly because I was involved with the project for two years. However, notwithstanding that bias (which is discussed further in Section 2.5 below), I attempt to understand the project so that it can be properly compared to a system that is not designed for hydropower projects alone, but for all infrastructure.

## **2.5 Ethical Considerations**

The approach to this thesis was evaluated by peer review before any field work commenced. An internal ethics review process involved filling in an ethics application form dealing with issues such as embarrassing interviewees, exposing them to potential discrimination and whether I have any conflicts of interest, then meeting with my supervisor and other academic staff members to discuss ethical concerns. Subsequently, the proposed approach to fieldwork was sent to the Massey University Human Ethics Committee as a low risk application, and consent to undertake that research was granted by the committee. During the fieldwork, all research was undertaken in accordance with the Massey University Human Ethics Committee Code of Ethical Conduct Research, Teaching and Evaluations Involving Human Participants (2006). The main issues that were given particular attention during the ethics review process are discussed as follows:

With respect to recruitment and access to participants, my aim was to access voices from government, donors (such as the World Bank and the Asian Development Bank), and industry participants. With this in mind, a list of public stakeholders involved in the power sector in Lao PDR, power project developers, and other organisations, and people that are important to the electricity sector in Lao PDR was developed. Some 18



organisations were identified to be important to the research and 18 individuals identified through my personal network were asked to participate. This form of purposeful sampling (Scheyvens and Storey 2003) was considered appropriate, because I needed to identify people with specialist knowledge of the Nam Theun 2 project.

An information sheet was developed, sent to all participants, and their permission to conduct a questionnaire was requested. As I personally know each of the participants, it was possible that they would feel compelled to participate because they want to help me. This was discussed with my thesis supervisors. In my information sheet, I made it very clear that their participation would be voluntary, and there would be no negative consequence for them should they choose not to participate.

Anonymity and confidentiality issues were considered, and it was determined that the questionnaire and interviews would not be anonymous but confidential. I am the only person who knows who the respondents were, and the names of respondents are not given in the thesis or other published documentation. All fieldwork information collected was analysed and aggregated so that themes can be drawn from the responses.

There was the potential for a conflict of roles in the research because some of the people I was to interview are past, present, and probably future clients. This had the potential to lead to a conflict, because it was possible that I would be unwilling to be forthcoming in this work as candid comments could cause offence and reduce workflow in future.

However, I understood that this was a critical academic study and my income from Lao PDR projects is not sufficiently significant to warrant such caution.

A further area of potential conflict identified in the ethics review process, was that fieldwork participants might feel conflicted between being open and protecting their employer, particularly because Laos is a communist country. However, the governmental candidates to be interviewed were senior and are involved in the development of policy, so they are more inclined to express an opinion whilst declaring where that differs from policy that has been formalised.

Overall, the Nam Theun 2 Case Study Project has been analysed to such a degree by participants in the project and civil society, that there is very little excluded from the public domain. However, as I have a close association with the project, and am familiar in a different context with the interviewees selected for the fieldwork, there were a number of sensitivities that needed to be taken into account during the research. For

example, the Lao people are not quick to criticise, and so shortcomings and lessons learned needed to be addressed diplomatically, usually by posing the question “What could be done better next time?” When I tried this though, such a general question was often met with blank looks in Laos (and many other places besides), leading me to focus on specific issues. I learnt this in my first interviews when I asked questions such as “What would you do differently if you were to do the project again?” Later, I learnt that a question such as “If you were to do the project again, what would you do differently about resettlement?” elicited better responses. Learning that discussions are the best way to gather information in Laos brought about a dramatic shift in the approach to my fieldwork methods.

## **2.6 Fieldwork Methods**

My original approach to fieldwork was to ask the 18 individuals selected for the fieldwork research to complete an open-ended online questionnaire. The questionnaire was intended to take about 15 minutes to complete, and the responses would then be themed and compared to literature and the case study referred to earlier.

The online questionnaire proved to have some shortcomings however, because respondents were passively resistant, indicating a clear preference for face-to-face discussions. The intention was that from the 18 individuals, 6 would be selected for face-to-face discussions based on the online questionnaire responses. In the event the questionnaire approach did not work because I failed to encourage respondents from such a long distance to make the investment in a questionnaire, but they were happy to meet and have a discussion. I hadn’t fully appreciated that people in Laos prefer discussion, instead of reading documents unless they are brief and preferably in the Lao language. How they retain so much information in their heads while dealing with multiple languages and new issues is a marvel! In any event, more contact than I had anticipated was needed and discussions were carried out with 12 people over four trips to Laos in February, April, and June 2010, February 2011 and by telephone. These included five government officials, three professional advisors to Government, two project development team members and two bankers.

My initial approach to interviews was to have a structured interview because I believed that such an approach would be most effective. However, it was during the first of these interviews that it became clear that a structured interview approach would not allow

candidates to speak freely and range over the subjects they felt were important. For example, in one meeting I asked an interviewee about the role of government in the project, and this morphed into a discussion on the fiscal benefits of the project being directed, in their view, to the wrong sectors. I typed up notes from my semi structured interviews and then brought these together into a series of themes that are discussed in Chapter 6.

As the “Doing Dams Better” book was not published until 2011, I was able to draft Chapter 6 from my own material and then go back to that chapter when I received a copy of the book to identify consistencies, conflicts, and gaps.

## **2.7 Data Analysis**

With transcripts of 12 interviews, the data analysis of field information was relatively straightforward. I used a thematic coding system as is common in qualitative research. From my notes of raw data I identified a number of key themes, such as legal framework, institutions, project selection, project modality, procurement and implementation, monitoring and evaluation. I developed a series of codes for each of these themes and developed a table using Microsoft Word that had two columns. The left-hand column contained the code and the right-hand column contained narrative from my notes that I cut and pasted into the table. I then sorted the table so that like-subjects were aggregated together. There were a number of duplications that needed to be deleted or merged into other rows. I then introduced a third column into the table and called this “rank”, which was used to sort what I considered to be the most significant subjects relating to each theme. By doing this I was able to find themes, patterns, and relationships that led me to be able to summarise the data into descriptive form. As I drafted the summary, I was able to add in my own analysis while reflecting on the literature as elaborated on in Chapter 6.

## **2.8 Conclusions**

My thesis seeks an understanding about what the literature says about my research topic, where there is a common agreement, differences, and knowledge gaps. I concluded that an examination of a particular project through a qualitative case study would be helpful to my research, even though the case study project involves some personal judgement about how I interpret and understand the world.

A central element of this thesis is to reconstruct the arguments supporting the trend towards increasing private sector involvement in the delivery of infrastructure. On this, my philosophical position is that there is an important role for the private sector to play in infrastructure, but that the State has an equally important role to play as the referee on behalf of society. Much of this thesis therefore explores the role of government to act as that referee.

With regard to my positionality, I conclude that my economics background provides a bias towards economic rather than social and environmental considerations. I also have a centre-right political outlook and was the financial adviser to the Government of Lao PDR with regard to the Nam Theun 2 project, which is the subject of the case study, so I bring my biases to the research whilst attempting to consider matters in a fair-minded way.

The basis of information for my case study is three-fold, involving: (i) a case study on Nam Theun 2; (ii) literature about the Nam Theun 2 project and; (iii) through confidential discussions with a range of people that have first-hand knowledge of the project. My original approach to fieldwork had some shortcomings because I hadn't fully appreciated that people in Laos prefer discussion to speak freely and range over the subjects they felt were important. I concluded that I could adapt to this change through thematic coding of topics and then summarising the data into descriptive form.

## **Chapter 3: LINKAGES BETWEEN THE STATE, INFRASTRUCTURE AND DEVELOPMENT**

### **3.1 The Role of the State in Development**

Government is like fire – at best an uncertain servant; at worst a fearful master - George Washington

This chapter sets out to explore the appropriate role of government in setting the right environment for the development of public infrastructure. To explore this issue involves understanding (a) what development is, (b) the role of the State in development, (c) what infrastructure is, and (d) the role infrastructure plays in development. For the State to have a role in development of public infrastructure, the answers to these questions need to conclude that both infrastructure and the State are important to development.

### **3.2 Defining Development**

Turning our minds to the first of the above four issues, in order to define development we must give it some character and understand a little about its history. There are a range of definitions of development, including one contained in the 1991 Human Development Report of the United Nations Development Program, which defines development as:

to enlarge the range of people's choices to make development more democratic and participatory. These choices should include access to income and employment opportunities, education and health and a clean and safe physical environment. Each individual should also have the opportunity to participate fully in community decisions and to enjoy human, economic and political freedoms. (UNDP 1991, p. 1)

There are other definitions, but this is a helpful overview of the ideals of modern development because themes of development and the services provided by infrastructure are brought together. Other definitions have prevailed over time and these have each influenced and been influenced by development ideology as it has evolved.

#### **3.2.1 Evolution of Development Theory**

Development thinking through the Age of Enlightenment, neoclassical economics, Marxism, and Keynesianism was based on “grand theories” that created a total “vision of society” that underpinned our understanding of development (Brohman 1995, p.

122). Much development theory since World War II has been dominated by the idea of modernisation. This was based on a “single model of modernity based on the experience of a few (industrialised) countries” (Brohman 1995, p. 122). Modernisation in turn, underpinned the “development project” that started with the establishment of the United Nations in 1943 and, following Bretton Woods in 1944, the establishment of the World Bank and the IMF. The project was based on the concept that the nation-state would be “the arena in which development was to be pursued” buttressed by international institutions (McMichael, 1996, p. 147). In other words, development was a national endeavour with support from other countries and supranational bodies. Those supranational bodies were essentially First World agencies; a term coined during the Cold War, which describes democratic countries employing a capitalist economic system that were aligned with the United States. Underlying post World War II development was the influence of the two main opposing ideologies of Communism and Capitalism. The development industry became an extension of foreign policy as Western nations sought to limit the spread of Communism and Communist countries, led by the USSR, sought to expand it (Cohen 1972).

The development project through the 1950s and until the 1990s typically focused on economic development through industrialisation, rural development, and structural reform. The period of “developmentalism” dominated until the 1970s and this period was notable for the central role of the State, high levels of nationalism, and a sense of nation building. Markets were heavily regulated, and the State led the way on large capital projects, some of which were aimed at import-substitution ideals (McMichael, 1996). From the early 1970s however, there was a “downgrading of the role of the State”, partly as a result of the positive impacts that liberalising markets had in developed economies in the 1960s. The oil crisis of 1973 also helped cement the move towards smaller government (Wade 1990, p. 9) and the World Bank declared that an ideal post-developmental policy would involve countries integrating with the world economy (McMichael, 1996). In the 1980s, structural reform policies led the World Bank to shift its focus from project based lending to structural adjustment loans that would create “good policy environments” in which government had poverty alleviation driving all its activities (Pender 2001, p. 408). The World Bank was by this time also oriented towards liberalisation and the adoption by its beneficiary governments of

market-led economic development as a principal development yardstick (McMichael 2004, p. 295).

The World Bank started in the mid 1990s to move from development based mainly on economic markers to a more multidimensional approach. The Comprehensive Development Framework (CDF) launched by the World Bank in 1999 signalled a move towards holistic measures of development (Pender 2001, p. 397). At its heart was a new aid paradigm aimed at poverty alleviation, sustainable development, and empowering Southern actors. Consequently, the World Bank's World Development Report of 2000/2001 identified a range of areas to be included in the CDF, and these were centred on improving opportunities for people, increasing empowerment and enhancing security (World Bank 2000, p. 31).

The CDF marked a significant move away from project based lending and structural adjustment, and importantly, signalled a transition from prescriptive measures to a more open and participatory engagement with developing countries. This "new aid paradigm" is based on inclusiveness, where the intent is for beneficiary countries to have greater input and be less led by donor conditions (Doug 2003). As part of the paradigm, development policy also became geared toward a single measure of poverty alleviation (United Nations 2000), but arriving at this point was somewhat haphazard (Renard and Antwerpen 2006). In part, this is because of inconsistencies between two separate initiatives that have been brought together and blended. The first initiative is the Poverty Reduction Strategy Paper (PRSP) approach developed by the IMF and World Bank in 1999 (Renard and Antwerpen 2006). The second are the Millennium Development Goals (MDGs) that arose from the Millennium Declaration of the UN General Assembly in late 2000. In this regard, a major criticism of the MDGs is that they are helpful to donors and Non Governmental Organisations (NGOs), but not to beneficiaries. This is because they are not country specific and do not provide adequate local ownership. An example is the sixth MDG regarding combating HIV/AIDS and Malaria, which is hardly relevant to countries like Turkmenistan, that suffer from neither affliction (Renard and Antwerpen 2006, p. 9).

Beyond the means by which the new aid paradigm is constituted, are wider issues about whether aid is effective. These have been articulated in particular by the four voices of Geoffrey Sachs (Sachs 2006), William Easterly (Easterly 2007), Dambisa Moyo (Moyo 2009) and Paul Collier (Collier 2008). Where Sachs' populist book, "The End of

Poverty” called for increased aid commitments from wealthy countries, Easterly criticised the ineffectiveness of aid delivery and Moyo called for effective abolition of aid altogether, on the basis that is not just unhelpful but is harmful because of the dependency culture it creates. Moderating these voices is Collier, who argued that several common factors underpin poverty. These include conflict, poor geography, relying on natural resources at the expense of other economic activity (the “Dutch Disease”), and weak governance (Negin 2010, p. 18). Not everyone believes that aid is ineffective however, and a representative view of this comes from Amartya Sen, who says development “can be seen... ..as a process of expanding the real freedoms that people enjoy” (Sen 1999, p. 3).

Today, then, we are faced with a system of development that has its detractors but nonetheless the main development relationships remain between Northern countries (including their Bretton Woods intermediaries) and Southern actors, however they might be evolving.

### **3.2.2 Recasting the Role of the State in a Post-Developmentalist World**

The role of the State has been much debated in development studies in recent times by notable academics such as economist Joseph Stiglitz (1989), political science professor Leo Panitch (1996), international security and conflict studies professor Thomas Biersteker (Biersteker 1990) and London School of Economics professor Nicholas Barr (2001). This debate has been held across a spectrum between post-developmentalism (where countries and their communities define and achieve their own goals) and globalisation (where individual tailor-made development is under pressure to yield to common standards). It is a little like comparing a boutique café with Starbucks.

If post-developmentalism has evolved into a new aid paradigm that gives greater autonomy to beneficiary countries, but the governments of those countries are seemingly less relevant because of the impacts of globalisation, then the role that governments play needs to be re-defined. The alternative is to let development just happen or to find another referee to set the rules. These approaches would be rather at odds with the neoclassical view of the role that government should play, which is that good economic outcomes come from finding a balance between market based principles and appropriate government intervention (Wade 1990). The ingredients of government interventions are to:



(1) maintain macroeconomic stability; (2) provide physical infrastructure; (3) supply public goods, such as defence and national security; (4) develop institutions that promote, for example, labour and financial markets; (5) stabilise prices where there is “market failure”; and (6) redistribute income to the poor.” (Wade 1990, p.11)

This neoclassical view of a government’s central role has been shared in all the social sciences. For example, economics dealt with national issues or issues of trade between countries. Cultural studies focused on national identity as a factor in what sets one country apart from another in a cultural sense. Development studies also placed the State in a pivotal role during the developmentalist period, which is evident in each of modernisation theory, dependency theory, and theories regarding world systems (Schuurman 2000, p. 12).

As the development project was followed by a period of post-developmentalism, there became a “demise of the project in development as globalisation took hold” (McMichael 2004) and a re-classification of the role of the State in development, particularly with globalisation as a backdrop. Phillip McMichael, a Professor of Development Sociology at Cornell University, observed this through a sociologist’s remark that “In circumstances of accelerating globalisation, the nation-state has become too small for the big problems of life and too big for the small problems of life” (McMichael, 1996, p. 149). Thus, for example, globalisation has brought about an environment where many global commercial organisations have more economic clout than the countries with which they are dealing. If this is so, then under these conditions the challenge for government is to identify the problems that are just the right size for government to manage.

The answer to the challenge to governments might be found in liberalisation, which is at the core of the debate about what roles are left over for government. This is because the role of the State is “being hollowed out from above as well as from below” through the application of liberal policies (Schuurman 2000, p. 12). From above, there is increasing involvement from international organisations in civil conflicts that have hitherto been left untouched and, from below, local governments have rising prominence. Added to these forces are deregulation, industrial reform, and privatisation which have weakened the role of government in the economy. Financial markets too, are now globalised and beyond the control of individual States. Alan Greenspan, a former chairman of the United States Federal Reserve, believed this to be so too, but argued that the principle

of an independent central bank is important for the depoliticisation of interest rate management and economic controls over inflation (Greenspan 2008, p. 110). Within this is the realisation that even the Federal Reserve has limited influence over market forces (Greenspan 2008, p. 196), but this is how it should be for as long as Adam Smith's "invisible hand of the market" is functioning properly.

### **3.2.3 Toward a Transformation of State Involvement in Development**

Where some have a pessimistic view of the role of the State in the face of globalism, others do not. McMichael, for the pessimists, sees an integrated plan of policy makers favouring market based development strategies over those managed by the State. International trade rules set by the World Trade Organisation (WTO) and, implicitly, the Group of Eight (G8) manifest themselves as policy conditions associated with multilateral support for developing countries. Southern governments that liberalise as a result are then exposed to international companies and banks, and those countries become subordinate to their market power (McMichael, 1996), (Chomsky 2010, p. 35). The consequent result is the need for a smaller and perhaps less influential role of the State. Others question whether the State's role in global governance is actually declining (Kjaer, 2004). Those others do not have a unified view, however, because neo-liberal economists believe that economics is most important and political scientists think politics are most important in deciding the debate, as if these are mutually exclusive. Neo-liberal economists like Rosenau (Rosenau 2006, p. 24), Mathews (Mathews 1998, p. 104) and Waltz (Waltz 1999, p. 694) argue that globalisation weakens the power of the State, while political scientists like Weiss (1995), Wade (1990) and Evans (1996) subscribe to a view that "States perform essential political and social-economic functions and no other organization appears as a possible competitor to them" (Waltz 1999, p. 699). Between the economy-centric and politico-centric positions lie the transformationlists. They believe that States are not necessarily in decline because they still control many aspects of government, but States do need to transform the role they have traditionally played towards one that complements the pressures of globalisation. They also say that international organisations actually give States more opportunities for collective action. Rather than global governance institutions and States being competing models for organisation, Kjaer believes that they are rather more complementary and each have their place (Kjaer 2004, p. 81).

The debate on the idea of globalisation causing a retreat of the State, and the rising significance of local government and civil society is ultimately framed by the view that the State still remains important in a political and strategic sense, because local governments are less well placed to take on “globally organised capitalism”. The military strength of the State still characterises how countries inter-relate as well, and globalisation assigns undue weight to economic and cultural definitions of the State. What has really been happening is there has been a shift in emphasis between the State’s role as a politico-military power to a techno-economic focus, which is evolution at work rather than a weakening of the State. Instead, the “definition of the State should be updated” (Schuurman 2000, p. 17). As the role of the State has changed, the role of civil society has changed. In essence, civil society (given democracy) shapes governments that in turn shape their State. On this basis, civil society does not replace the State and elected government, it drives its being (Schuurman 2000, p. 18).

From all this comes more than a glimmer of hope that the State, despite the pressures of globalisation and perhaps because of it, remains a relevant political and economic unit, but its role is evolving. Consequently, in modern times the State might not have less purpose, but it may place a different emphasis in providing the functions formerly perceived as being a public preserve. If so, the new aid paradigm and States do have a part to play together and consequently the State is an important infrastructure stakeholder. Whether infrastructure is important to achieving national goals has still to be explored and this is the subject of the next section.

### **3.3 The Role of Infrastructure in Development**

You and I come by road or rail, but economists travel by infrastructure – Margaret Thatcher

#### **3.3.1 Infrastructure Defined**

We think of infrastructure as a term that is well known popularly, but few would be able to adequately define infrastructure if put to the test (Torrise 2009, p. 6). The term “infrastructure” has only been used recently, emerging into common parlance in the 1960s (Torrise 2009, p. 6). The American Heritage Dictionary states that the term has been used since 1927 to mean “roads, bridges rail lines, and similar public works” (The Free Dictionary, 2010). However, the 1952 edition of the Concise Oxford Dictionary has no entry for infrastructure, nor is the term found in important writings from the end of World War II to 1962 (Prud’homme 2004, p. 3). The Oxford English Dictionary

certainly has an entry today, referring to infrastructure as “the basic physical and organizational structures (e.g. buildings, roads, power supplies) needed for the operation of a society or enterprise” (Oxford Dictionaries, 2008). What is interesting about this definition is that the physicality of infrastructure is present, as it is in the definition found in the American Heritage dictionary, but the reference to “public works” is now absent. I will refer to this a little later, but a recurring definition of infrastructure is that it involves the: “physical structures that form the foundation for development” (BBC, 2008). Again the physical essence of infrastructure has been given in this definition, and this tangibility is clear because it is evident that a power station, for example, physically exists. However, if that same power station has no staff or fuel to operate then it is unable to produce electricity and contribute to the “operation of a society”. In other words, if the infrastructure cannot be used to provide a service, then it cannot contribute to the operation of society as the Oxford dictionary tells us – the definition is therefore incomplete. Remy Prud’homme, an economics Professor at the University of Paris, gives an alternative perspective. He states that:

First, [infrastructure] are capital goods. They are not consumed directly. Rather, in combination with labour, and possibly other inputs, they provide services. (Prud’homme 2004, p. 155)

This helps narrow down the definition of infrastructure into capital goods that are operated to provide services. The power station example fits this definition, but so does a private house that is rented to a private tenant. Intuitively, the latter example should not be considered as infrastructure because the service is provided exclusively to a particular tenant. However, the definition of infrastructure should provide for a public housing scheme that is provided to the public as a social service. Therefore, infrastructure is perhaps best described as involving capital goods that are operated to provide services to society (Torrise 2009, p. 26). The types of services to society that would meet this definition would include energy systems, health services, water and sewerage, and communications. In turn, energy systems include the sub-components of electricity generation, transmission and distribution, and gas delivery systems. Communications include postal services, telecommunication, transportation and so forth.

Richard Webb, an Australian economist, developed a useful distinction between the various types of infrastructure and how the responsibilities for each are divided between

levels of government. Webb's also specified whether the infrastructure is economic or "social" in nature as shown in Table 1.

**Table 1 – Infrastructure Categories, Types and Governmental Responsibilities in Australia**

<b>Level of Government</b>	<b>Economic Infrastructure</b>	<b>Social Infrastructure</b>
<b>Commonwealth</b>	Aviation services (air navigation etc.) Telecommunications Postal services National roads (shared) Local roads (shared) Railways (shared)	Tertiary education Public housing (shared) Health facilities (shared)
<b>State</b>	Roads (urban, rural, local) (shared) Railways (shared) Ports and sea navigation Aviation (some regional airports) Electricity supply Dams, water and sewerage systems Public transport (train, bus)	Educational institutions (primary, secondary and technical) (shared) Childcare facilities Community health services (base hospitals, small district hospitals, and nursing homes (Shared) Public housing (shared) Sport, recreation and cultural facilities Libraries Public order and safety (courts, police stations, traffic signals etc)
<b>Local</b>	Roads (local) (shared) Sewerage treatment, water and drainage supply Aviation (local airports) Electricity supply Public transport (bus)	Childcare centres Libraries Community centres and nursing homes Recreation facilities, parks and open spaces

Source: Webb (2004)

Most governments do not have federal, State, and local bodies, but the table helps delineate generally how the responsibility for infrastructure delivery is apportioned. The

table also divides infrastructure into that which has an economic nature, and that which is seen more as a public good that can be classified as “social infrastructure”. Some types of social infrastructure shown in Table 1 can also be operated on a commercial basis, so perhaps a better way of characterising social infrastructure is the “infrastructure needed to provide a public good”. Public goods have two features, which are (a) if a good is provided for one individual then it must also be provided to others, and (b) if one individual uses the good, then this does not reduce the availability of the good to others (Kjaer 2004, p. 129). This is very broad, and a more apt definition of a public good in relation to infrastructure might be that it is a service provided by a public agency for everyone’s benefit for which direct payment is not possible. National defence is often given as an example of a public good, and the definition above fits well with how we think of defence. Governments provide a military capability as a “free” service for the protection of its people, but of course we know that the military is funded from taxes. While national defence is absent from Webb’s table, it can truly be classified as a type of social infrastructure. Childcare centres on the other hand, also serve social needs but they can be provided as a commercial service, so it is less clear whether they really are a social infrastructure or are a type of economic infrastructure. Recalling our new definition of a public good helps shed light on this question, because under its application a childcare centre is not a public good. From this, it becomes clear that certain types of infrastructure could be commercial, or micro-economic in nature. This means that the full cost of providing the service can reasonably be expected to be recovered from end users. Infrastructure can also be macro-economic, or social in its nature. This type of infrastructure cannot be funded on a user pays basis, but it adds macro-economic value nonetheless. The responsibility for delivering this macro-economic infrastructure usually rests with public agencies, but part or all could be sub-contracted to commercial enterprises too.

Bringing all this together, infrastructure can be characterised as involving capital goods that are operated to provide services to society. Where the full cost of providing services can be recovered from end users, this type of infrastructure is called “economic infrastructure”. Where infrastructure serves a public good and is provided by government, it is called “social Infrastructure”.

### **3.3.2 The Relationship between Infrastructure and Development**

The BBC definition given on page 21 describes infrastructure as “the foundation of development”. Equally, the CDF discussed in Section 3.1.2 includes “education and health policy and provision, water, sewerage, electricity and transportation systems” within its framework. By these measures, compelling arguments can be made that infrastructure is an important ingredient to development. However, development has a number of aspects and the more significant of these require exploration to establish the strength of the relationship between infrastructure and development. These include economic development, sustainable development, and poverty alleviation. These will be discussed in turn below.

#### **3.3.2.1 Economic Development**

There is a positive linkage between infrastructure development and economic development. Infrastructure services are indirect inputs to production and if the costs of these services are lowered, then the profitability of firms increases, which helps drive output, incomes and employment. Well developed infrastructure also enhances the welfare of households because clean water, sanitation, and healthcare improvements, in particular, improve living standards (Kessides 1993, p. 2). This was not a casual conclusion made by Kessides, a Lead Infrastructure Economist and Urban Specialist at the World Bank, but followed the most comprehensive review of literature about the economic usefulness of infrastructure to 1993. Kessides noted that the majority of research on the topic of infrastructure investment and economic growth was focused on observing the relationship between increasing infrastructure stocks and the consequent impact on economic output. Most literature at the time had been developed during the 1980s and had a particular orientation towards developed countries by scholars such as Hulten (Hulten 1996), Fox (Fox 1990) and Munnell (Munnell 1992), and organisations like the World Bank. Most of this work concluded that there was a positive and material relationship between infrastructure and economic output, but Kessides noted that much of this research was also subject to criticisms regarding methodology. Particular concerns related to a failure to observe that “economic growth can lead to public capital expenditure as well as result from it” (Kessides 1993, p. 4), econometric shortcomings such as not taking into account private infrastructure investment, analysis not been made on a sector by sector basis, and a lack of observation regarding the flow of services actually generated as a result of infrastructure investment.

A number of studies before 1993 took an alternative approach, by correlating public expenditure and output (Easterly and Rebelo 1993; Baffes and Shah 1992, Devarajan, Swaroop, and Zou 1993) but these too had mixed results. Easterly and Rebelo's study found a strong correlation between public investment and transport and communication infrastructure, but found that infrastructure investment is not correlated with private investment, which somewhat defies the later trend towards such investment. The study also found that not all types of public investment lead to growth either. To shed further light on this finding, Baffes and Shah conducted a similar study that examined the relationship between per capita GDP and public investment. They went further than Easterly and Rebelo by analysing infrastructure investment alongside human resources, development capital, military expenditure, and private capital and labour. Other than for military expenditure, all of these categories had a positive relationship with growth, but infrastructure investment had the lowest impact. To confound matters even further, and in contrast to Easterly and Rebelo's study, a negative relationship between government investment in transport and telecommunications, and per capita GDP growth after considering a 20-year time series and 69 developing countries was also established (Barro 1991, p. 430). The author concluded that political factors sometimes lead to infrastructure investment in the right sectors but the wrong projects. In other words, infrastructure investment only adds value if allocated in the right way.

Later studies considered the relationship between physical capital stocks and output. These include Canning and Fay (1993), Hardy and Hudson (1981), and Queiros and Gautam (1992). Canning and Fay introduced the concept of considering physical infrastructure stocks, and their later studies focused on telecommunications and paved road networks, respectively. Canning and Fay (1993) concluded that investment in transport and communications leads to significant growth over the long term, but short term effects are not so significant. The study also concluded that developed countries with high infrastructure stocks have less of a growth response, than countries starting with a low base of infrastructure. Notably, where Kessides and others saw infrastructure as a factor of production, Canning and Fay viewed infrastructure as a pre-condition for significant economic growth. This is an important distinction, because infrastructure as a factor of production suggests that it may be substituted by other factors, or that production can occur to some extent without infrastructure. However, when infrastructure is a pre-requisite for production (such as roads for transporting finished



goods) then the importance of infrastructure is elevated. It is likely that the infrastructure is both a factor and a pre-requisite depending on the situation. The other studies supported these findings, suggesting that improved infrastructure increases productivity and output because of efficiency gains.

Studies that have focused particularly on the correlation between infrastructure and sectoral output include those made by Binswanger (1987), Antle (1983) and Chhibber (1988). Binswanger found that roads reduce transaction costs, but that it is difficult to isolate the economic impact of these investments from other factors that lead to economic growth. Antle also considered the relationship between transport and telecommunications investments with agricultural output and had similar conclusions to Binswanger. Chhibber's contribution to the literature was that there are better supply responses to infrastructure investment in less developed countries, than those that are developed. In more developed countries, price is a major determinant of supply.

Research regarding infrastructure investment and differences between the growths of one region versus another was also considered by Kessides. Romer (1986) and Lucas (1988) determined that differing levels of infrastructure investment largely account for regional differences. However, Kessides noted that industrial location is a predominant factor in these differences, which was also supported by Hulten and Schwab. Several other studies considered by Fox and Murray (1990) paid particular attention to infrastructure as a means of attracting private capital, finding that transportation is a more important factor in this respect than any other type of infrastructure. Other studies by Looney and Frederiksen (1981), Mera (1973) and Eberts (1986) for Japan and the U.S respectively concluded that investment in fast-growing or well-developed regions has a greater impact than investment in low growth or poorly developed regions. A study by Evans (1990), was the final paper considered by Kessides with regard to regional infrastructure investment. Evans highlighted infrastructure in an urban setting, and its important role in facilitating interactions between urban and rural markets.

Kessides final review of the relationship between infrastructure and economic output considered the relationship between public and private investment. In particular, the concepts of crowding in and crowding out were considered in the context of literature by Chhibber and Dailami (1990) and Serven and Solimano, (1992). These papers confirmed that public investment in infrastructure promotes private investment in

developing countries, which is contrary to public investment in non-infrastructure activities.

More recent research into infrastructure relationship to economic growth has involved scholars taken five different approaches to try and understand and quantify the correlation between infrastructure and productivity/growth (Infrastructure Canada 2007, p. 11). The first of these is the “production function” approach, which attempts to measure the increase in production from each element of the production process. Research in this area includes Holtz-Eakin (1994), Wylie (1996), Zegeye (2000), Bonaglia et al. (2000), Rodriguez et al. (2001), Puig-Junoy (2001), Kemmerling et al. (2002), Stephan (2002), Wang (2002) and Bin Dong (2005). The consensus amongst these studies is that infrastructure positively influences economic output, but there is not universal agreement about the exact response from investments. Equally, infrastructure investment has an opportunity cost, and in some cases other types of public investment yield better returns. There are also implications for labour because infrastructure investment might increase productivity, but it can reduce the demand for labour at the same time (Infrastructure Canada 2007).

Of the four remaining methods, the “cost-function” approach is like the production function, except that prices of inputs are used rather than units. Scholars focusing on this approach include Bertrand (2001), Morina et al. (2002), Harchaoui et al. (2003), Cohen et al. (2004), Satya (2004) and Brox (2005). From this research, comes a cautious endorsement of the general findings of scholars examining infrastructure’s impact on the economy from a production function viewpoint. However, the most significant contribution from the research is that the payback period of infrastructure investments is longer than production-function analysis suggests (Infrastructure Canada 2007, pp. 28-29).

The “growth model” form of analysis has been used to understand the impact of all factors of production on output. Investigations by Martin (1999), Aguayol et al. (2000), Haughwort (2000) and Canning et al. (2004), conclude that infrastructure is positively correlated with economic output, noting that an inflection point is reached when further investment in infrastructure negatively affects growth. The growth-model approach also indicates that infrastructure investment in one region can negatively impact another, especially those further away (Infrastructure Canada 2007, pp. 32-33).

Fourthly, the “data-oriented model” approach is not based on economic theory, but instead analyses data sets to form conclusions. Studies by Sturm et al. (1995), Lau et al. (1997), Mittnik et al. (2000), Zhang et al. (2001), Calderon et al. (2004), Karadag et al. (2005) and Pereira et al. (2006) found that only investment in basic infrastructure increases output. This research also concluded that regional differences do occur when infrastructure investment is made differentially, but that spillover benefits from an invested region to another occur (Infrastructure Canada 2007, p. 43).

Finally, the “general-equilibrium model” aims to understand the impact of infrastructure investments on a whole economy. The general equilibrium model is considered by Gramlich (1994), Infrastructure Canada (2007), Estache et al. (2009) and Dissou (2011) to be a more comprehensive means of assessing the connection between infrastructure and economic output. They find that each of the other approaches have some particular shortcomings concerning agreement on a common definition of infrastructure and data related problems, even if there are some major general findings and areas of agreement. Holtz-Eakin et al. (1995), Rijo (1999), Rudd (2000) and Dissou et al. (2011) have undertaken principal research in the area of general equilibrium models involving infrastructure. From the most recent of this work, Dissou concludes that:

public investment in infrastructure, through gradual onset of positive supply-side effects of public capital formation, can play a pivotal role in supporting private sector investment, and thereby sustaining a domestic process of capital accumulation. (Dissou, Didic et al. 2011, p. 28)

Overall, what can be concluded from the work that has been done to date on the connection between infrastructure and economic development is that infrastructure is beneficial from an economic viewpoint, but the relationships are complex and it is not possible to set concrete benchmarks that policymakers might use with confidence. In other words, infrastructure development projects have to be judged on their individual merits. What this really means is that it is not yet possible to say “four parts of road, five parts electricity and three parts water and sanitation will result in 4.2 percent GDP growth”. In other words, a top-down approach will not work alone and a rigorous assessment of infrastructure projects against national development priorities that are in themselves multi-dimensional (economic, social and environmental) is needed instead. All this points to the need for a holistic system of planning and implementing appropriate infrastructure interventions.

### **3.3.2.2 Sustainable Development**

Infrastructure uses natural resources, not only in the operation of the structures that are created, but also in the use of raw materials for construction and in the loss of biodiversity from the land taken over by that infrastructure. (Fay, Toman et al. 2010, p. 336). It is timely then, to recall that development is measured by a number of dimensions – economic arguments for infrastructure development cannot be considered alone. The United Nations Industrial Development Organisation (UNIDO) notes, for example, that infrastructure also brings costs that need to be measured and set off against the benefits in determining whether a particular project should proceed (United Nations Industrial Development Organization. 1996). The role of infrastructure in economic development is important, but should not be the sole or primary measure when making infrastructure decisions (Chapman, Goldberg et al. 2003).

Issues of sustainability are also important, but there are differing interpretations of sustainable development (Estes 2010, p. 86). In the context of development however, reference can be made to the seventh of the Millennium Development Goals (MDGs), which is to ensure environmental sustainability (World Bank 2011). With this in mind, infrastructure should limit the drain on the use of resources so that the quality of life of people today and in future is not compromised, but it should not be presupposed that infrastructure development should simply minimise the net drain on resources. In some cases, infrastructure, especially in the area of water and sanitation, can provide substantial net benefits from a sustainability standpoint whilst achieving other MDGs in tandem (Fay, Leipziger et al. 2003, p. 10).

If sustainable development is concerned with social and environmental sustainability, then comparing economic criteria with sustainability criteria is a potentially difficult and fraught area. One way of addressing this is to find a common unit that can be used to properly account for economic, social, and environmental factors. This is dealt with in the area of environmental economics where all three factors are broken down into monetary values, but there are opponents to this approach too. Common (2000), Keen (2001), and Spangenberg et al. (2010) believe that: the valuation methods used to price the environment are subjective; valuation is a singular dimension when other approaches like multi criteria analysis have a place; not all values, like moral values, can be accounted and there are problems associated with “discounting the future” (Spangenberg and Settele 2010, p. 334). What is suggested instead is that valuing the

environment be amongst a range of tools that are taken into account by decision-makers, but not be the only tool. Therefore, the idea of assigning monetary values to social and environmental matters has a place for as long as a robust method of valuing society and nature is honestly made and then possibly as part of a multi-criteria approach.

Cambridge academic Arthur Cecil Pigou introduced the valuation of benefits and costs. As he travelled by train between London and Cambridge during the 1950s, he observed that people living close to smoke-belching chimneys had to wash their clothes more often because of emissions, and that the extra cost of doing so was not borne directly by the offending factory owners. In response to these thoughts he wrote:

Nor does the damage done to people living near smoking factories and the extra washing bills they have to pay enter into the price of the factory's products. If they did, as, with strict social accounting, they ought to do, the price of those products would be higher, less of them would be demanded and less resources devoted to making them. (Pigou 1954, p. 10)

The effects of these smoke-belching chimneys became known as “externalities”, which need to be considered when considering the costs and benefits of proposed infrastructure projects. These are the positive and negative side effects caused by a project that would not ordinarily be factored into the price of the service. Externalities are costs that are external to the direct costs of production therefore.

Cost-Benefit, or Benefit-cost, Analysis (CBA) is perhaps the best attempt at analysing the full costs and benefits of a project, including social and environmental externalities. Roger Vickerman, a Professor at the University of Kent's School of Economics, tells us that:

The idea of CBA is a simple one: if all the costs and benefits associated with an infrastructure project can be monetised then, whether or not they are realised as financial returns, the overall impact of a project can be expressed as a rate of return or, more usually, as a benefit-cost ratio (BCR). (Vickerman, 2007, p. 599)

However, CBA depends very much on how well costs and benefits are measured. When a direct measurement cannot be used, “shadow” prices must be calculated, and this is especially true for valuing externalities (Vickerman, 2007). This difficulty of measurement is a significant concern because the accurate measurement of sustainability is still a fledgling field in economics. A practical problem for lower

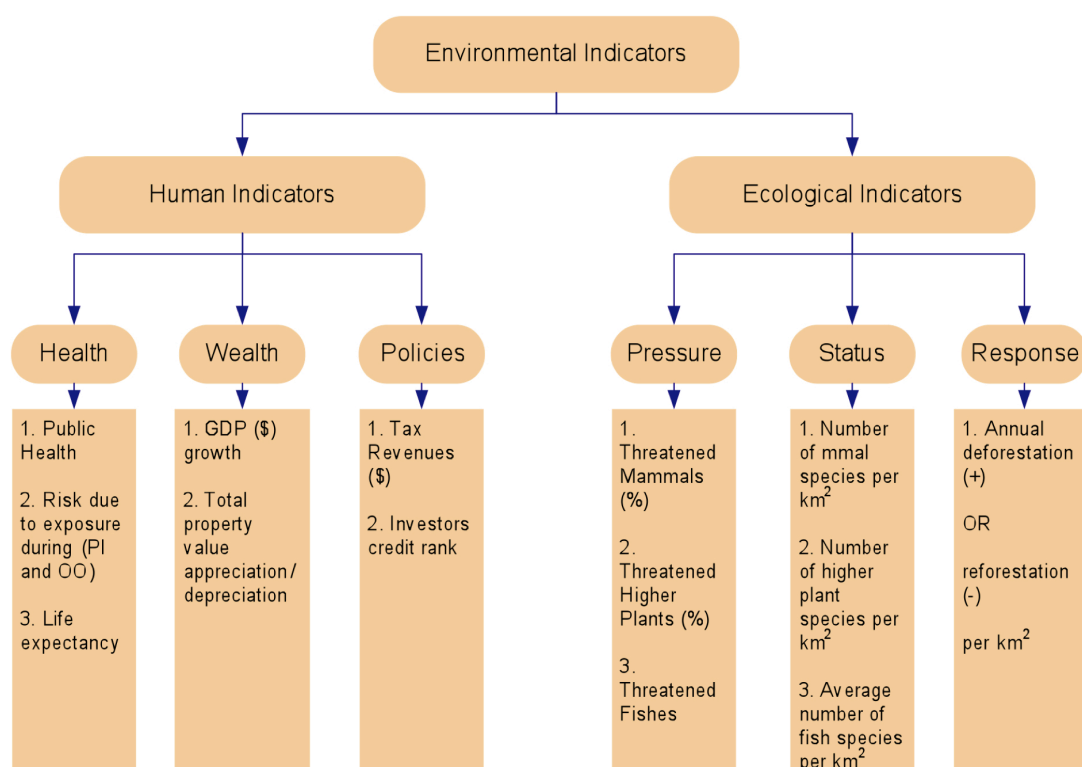
income countries is posed because their ministries often do not have economists who are trained to carry out an infrastructural cost benefit analysis with confidence. Unless the project is to receive support from development partners, it is easy for the analysis simply not to be carried out, and the project to be approved because it is financially feasible. That is, social and environmental externalities are not factored in. Often, even governments in high income countries do not permanently employ economists skilled in benefit-cost analysis. They outsource the service to specialised firms instead, but firms are not usually residing in developing countries and nor are they cheap. The answer to the problem of appropriate analysis of social costs and benefits not being carried out by policymakers because of limited resources, is education on the importance of CBA and identifying funding to pay for people skilled in this area.

Therefore, the point to this discourse about sustainable development is not to treat the subject as being separate to economic development. It is to find a way to incorporate sustainable development into the mathematics of economic development so that economic, social, and environmental matters are properly considered together. One way to address this is to establish a range of indicators to measure the sustainability of civil infrastructure projects.

Susmita Dasgupta, a lead environmental Economist of the World Bank, describes the three stages of a project being: Project Planning (PP), Project Implementation (PI) and Ongoing Operations (OO).

Figure 1 below sets out an example of indicators as they affect each of these project stages.

**Figure 1 – Categories of Environmental Indicators**



Source: (Dasgupta and Tam 2005, p. 35)

While economic development is not the sole measure for determining the relative attractions of infrastructure projects, environmental economics has a role to play in monetising the social and environmental costs and benefits of proposed projects. In line with these sentiments, the former World Bank Chief Economist, Joseph Stiglitz said, “It used to be that development was seen as simply increasing GDP. Today we have a broader set of objectives”, but that “increasing GDP is essential to achieving the other objectives” (Pender 2001, p. 73). This means that development projects that have positive net benefits should lead to an increase in GDP, so economic measures that also internalise externalities are not an unreasonable yardstick for development.

### 3.3.2.3 Poverty Alleviation

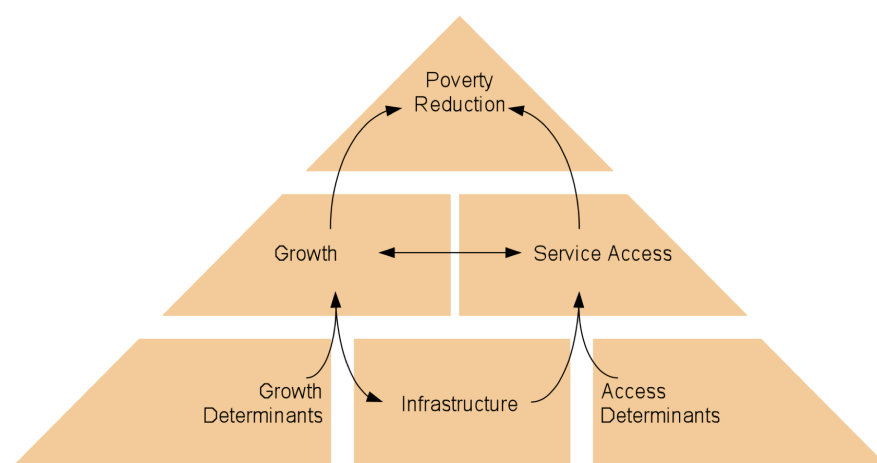
If development outcomes are now universally measured in terms of poverty reduction, then perhaps the most valuable literature regarding infrastructure and development is that which links infrastructure to reducing poverty. The ADB (2005), Willoughby (2004), Prud’homme (2004), Louis Pouliquen (2001) and Kessides (1996) studies lead the literature in this regard.

The ADB for example, lists infrastructure's role in reducing poverty as meeting basic needs, facilitating people earning a living through transport, health, and education. Infrastructure is an intermediate input into production, with power and water being examples as being necessary for businesses to operate. In short, infrastructure helps produce healthy, educated people who are employable as labour to production. Production is then connected by infrastructure to markets. In particular, the ADB's 2005 'Connecting East Asia: A New Framework for Infrastructure' report has a view that:

At its best, infrastructure can draw poverty reduction, service provision, and growth into a reinforcing cycle: more growth enables providers to expand services, while enabling users to afford these services. Further service provision encourages more growth. And stronger growth and better access to services both lead to greater impacts on poverty reduction. (Asian Development Bank, 2005, p. 55)

Pouliquen, a former economist at the World Bank, is even more specific in his paper entitled "Infrastructure and Poverty" in which he states that "the link between infrastructure and poverty is no more obvious than that between famine and crop production" (Pouliquen 2000). On this basis, there are a number of elements that make up the ADB's reinforcing cycle between infrastructure and poverty that is so obvious to Pouliquen. These are shown in Figure 2 below.

**Figure 2 – Links among infrastructure, poverty reduction, and growth**



Source: (Asian Development Bank, Japan Bank for International Cooperation et al. 2003, p. 77)

In short, Figure 2 describes the inter-relationships between infrastructure and poverty reduction, because poverty reduction is linked to economic growth, which in turn is linked to access to services that are provided primarily by infrastructure. Not all these



relationships are to do with economic outcomes, because the ADB's 2005 study also links infrastructure with non-productive benefits to the poor. One example of this is that better transport can provide people with greater access to household water and energy sources, a responsibility that is often filled by women (Asian Development, Bank, 2005).

Brenneman and Kerf's (2002) review of the tie between infrastructure and poverty reduction identifies a number of pro-poor themes, including an endorsement of the growth relationship between infrastructure and poverty alleviation as illustrated in Figure 2. Brenneman notes however, that investment in water and sanitation has a more tenuous impact on growth (Brenneman and Kerf 2002, p. 2). While that may be so insofar as growth is concerned, sanitation improves health outcomes and spills over into achieving other MDGs (Fay, Leipziger et al. 2003, p. 3). Specifically, Fay says:

the environmental health impact of access to infrastructure is likely due to a combination of clean water, lack of indoor pollution, good sanitation and decent dwelling quality. (Fay, Leipziger et al. 2003, p. 10).

Where there is debate about the impact of water and sanitation interventions, there is agreement that investment in all infrastructure sectors help health outcomes (Brenneman and Kerf, p. 2). Transport and energy investments are inclined to help the poor through education and access to markets and telecommunications helps improve governance. Root (2005) however does not contest the links between infrastructure investment and poverty reduction, but does question the efficiency of existing governance structures that tend to be centralised, leaving less aid money available for infrastructure when it eventually finds its way to communities (Root, Ghosh et al. 2005).

### **3.4 Summary**

This chapter set out to examine the relationships between the state, development and infrastructure. The purpose for doing so was to see whether the state and infrastructure are important to development and whether they themselves are also interrelated. First, an understanding of development was needed, so the evolution of developmentalism, post-developmentalism and the New Aid Paradigm was explored, concluding with the sentiments of Amartya Sen regarding development being a process of expanding peoples' freedoms.

As themes of development have changed over time, so too have perceptions regarding the purpose of the state. The neoclassical view of the state's role, which includes the provision of infrastructure, has been challenged by liberalisation and globalisation. It has also brought about a transformation of the state toward a politico-economic function that facilitates the efficient use of resources.

Attention turned to the role that infrastructure plays in development and so infrastructure needed some definition. It was concluded that infrastructure involves capital goods that are operated to provide services to society. Where that infrastructure can operate on a user pays basis, it is called economic infrastructure and otherwise it is social in nature.

The links between infrastructure and economic development are well recorded in the literature and research has centred on five methods to quantify the relationships more clearly. Each has concluded that infrastructure is positively correlated with economic output, but there is no formulaic template that can be applied. Economic assessments must also take questions of sustainability into account and cost-benefit analysis can help in this regard, but not as a sole measure because of the inability to value the environment with high levels of certainty. Getting this balance right is crucially important to poverty reduction, however, because there is a reinforcing cycle between infrastructure investment, access to services, growth and poverty alleviation. To do so effectively means implementing country specific approaches that consider the various options for infrastructure development. This requires an understanding about how infrastructure provision has evolved over time and about the current situation. These issues are explored in the next chapter.

## **Chapter 4: THE EVOLUTION OF INFRASTRUCTURE PROVISION AND IMPLICATIONS FOR DEVELOPING COUNTRIES**

### **4.1 Introduction**

History teaches everything including the future. – Alphonse de Lamartine

As the future is built on what has gone before, to fully understand the possibilities of infrastructure provision it is helpful to know how infrastructure has been developed, owned, and operated over time. This background helps put current infrastructure arrangements in context and offers some indications for the future. This last step is the most difficult to determine, because the future can only be predicted and any predictions are necessarily a construct.

This chapter focuses on infrastructure provision in relatively modern times, starting with Europe and then the United States before World War II. After the war, it becomes clear that developments in infrastructure were driven by social change, varying ideologies and changing schools of thought around development. A particular theme is the increasing involvement of the private sector in infrastructure, raising questions about the role of government.

### **4.2 Historical Provision of Infrastructure**

Curiously, for two centuries, infrastructure as an analytic concept has been practically absent from the economist's tool box. – Prud'homme (2004)

#### **4.2.1 European Infrastructure**

There is a popular view that infrastructure in Europe has historically been largely a public endeavour – but this is incorrect. Instead, provision of infrastructure has been carried out by both public and private actors. Philosophy regarding who provides which service has changed, as various political movements have come and gone, and it is not possible to distinguish precisely between which services naturally fell to the public or private sectors. In fact, often privately constructed infrastructure has been owned and operated by governments, or the service has at some point in its life been nationalised (Jacobson and Tarr 1995, p. 2). Private sector actors in the 19th Century were frequently the first movers, and subsequently became the principal providers of

railways, telegraph, gas, electricity, and water services. Usually, these services became monopolies and they were sometimes intrusive as lines, pipes, and mains were laid over existing streets and buildings. This drove a need for close regulation, and in some cases services were taken over by local or central government, but it was not their natural inclination to do so (Millward 2004, p. 4).

Turnpike Trusts in the United Kingdom are an example of the public/private divide in infrastructure provision. These trusts were effectively toll road organisations that started in the 1700s and charged tolls to road users. The responsibility for roads had previously been with Parishes, but they were only able to fund road developments through property taxes. Turnpike Trusts were permitted by act of parliament and the model brought about a four-fold increase in road development between 1730 and 1800. Overall, 1,000 Turnpike Trusts were established, and these accounted for some 20,000 miles of road in Britain, being “one of the most expansive road networks in history” (Bogart 2005, p. 480).

While the private sector led the way in infrastructure development in the 19th Century, government had to become increasingly involved when, for example, dealing with infrastructure rights of way where land was scarce. This was especially the case with network utilities in urban areas, such as gas, rail, and telegraph (Millward 2004, p. 7), so we can see that industrial age infrastructure was private sector led with governmental interventions from time to time. However, European states did not act entirely benevolently, because they had two other interests regarding infrastructure. The first of these was to link remote regions so that “political and social unification” could be promoted. The second interest was military, especially regarding communications infrastructure for moving troops by rail and messages over the telegraph (Millward 2004, p. 17). All this led to a “variegated pattern of regulation and ownership... [which led to] ...controls on prices, subsidies for track construction and operation, guaranteed rates of return, concessions with fixed term leases and municipal undertakings on State ownership” (Millward 2004, p. 5). This demonstrated that there was no one model for infrastructure provision and the evolving and varied approach prevailed up until World War I (Millward 2004, p. 4).

Of all the various arrangements for infrastructure provision that had been attempted, we will see later how the French concession model has stood the test of time and finds a firm place in modern infrastructure development. An infrastructure concession is a right

usually granted by a governmental entity, to a commercial organisation to finance, build, operate, and transfer an infrastructure asset for a period in return for a revenue stream that is terminable, should the concessionaire fail to perform as expected (Guasch 2004, p. 26). We will return to this later when project finance and the evolution of public-private partnerships (PPPs) are explored.

In the meantime, all these different types of services elicited differing responses from society regarding their “publicness”. For services perceived as being private, there had been a tendency toward private provision and vice versa. Public goods had often been provided free of charge, even though they could be provided on a user pays basis. National highways, parks, public libraries and police services are examples of these public goods. Making access subject to payment was often seen as a “denial of rights”, however (Jacobson and Tarr 1995, p. 30) we can see from our earlier discussion in Section 3.3.1 that there are some differing viewpoints about what infrastructure should be a pure public good, and what could be a user pays-based public service. Where there has been any doubt about whether the service in question is a public or private activity, the default choice was for service delivery to be made by a public organisation and funded from taxes. Over time, it seems that it became taken for granted that these services would be provided by the State. Most public services had also been labour intensive, meaning that many public employees have historically been involved in infrastructure services. With them came the growth in labour unions that were resistant to changes that might threaten jobs and employment conditions. This all helped society come to believe that infrastructure should be a public endeavour in Europe. However, this belief was not so pronounced in America.

#### **4.2.2 Infrastructure in the United States**

The United States, while younger than Europe in a developmental sense, was catching up fast in infrastructure development in the late 19th Century, brought on by the forces of the Industrial Revolution. Attitudes to private sector involvement differed in the United States compared to Europe, because such involvement was viewed as being aligned with notions of individual effort to reduce the risk of undue political interference (Jacobson and Tarr 1995, p. 4). An exception to private sector led development in the United States arose during the Great Depression of the 1930s, when President Roosevelt launched the New Deal program. The program was a Keynesian

styled means of using public spending to promote economic growth. Capital and labour-intensive infrastructure was therefore a particularly appealing target for the government. The Hoover Dam and the creation of the Tennessee Valley Authority are two notable examples (Wallis 1998, p. 28, 94), but the New Deal program can be regarded as a temporary emergency measure that eventually saw a return to private sector dominance in U.S infrastructure.

From the turn of the last century, provision of infrastructure in the United States was driven mostly by the private sector for systems that can be operated on a user-pays basis, whereas in Europe an opposing philosophy was developing, and this was sparked by social changes precipitated by the close of World War II (Jacobson and Tarr 1995, p. 26).

#### **4.2.3 Social Changes and Development**

After World War II, the United States chose a path of regulation over privately held infrastructure businesses, whereas in the United Kingdom a strong social orientation developed in response to the rigours of the war. This was fuelled by a desire by returnee soldiers to challenge the class system in Britain. Clement Atlee's Labour government nationalised the coal, gas, and electricity industries between 1947 and 1949 in response. There was popular support for improved social services, such as the National Health Service, which was established around this time (Hennessy, 1993). Consequently, public ownership of infrastructure prevailed as the default model throughout the 1950s and 1960s in the United Kingdom, partly because monopolistic power and capital intensity suggested benign ownership by organisations with large balance sheets (Kessides and World Bank. 2004, p. 31).

Therefore, it was no surprise that infrastructure development in developing nations was also led by the State. This was partly because many were still influenced by former colonial powers, and also because the Bretton Woods institutions modelled their programmes on industrialised nations. That is not to say that these nations were following an entirely common path though, because we have already seen that Europe was nationalising, and America was inclined toward private enterprise involvement in infrastructure. Nonetheless, both of these approaches were accommodated under the umbrella of modernisation theory, which was introduced in Section 3.1.2.

As the basis for much economic policy following World War II was modernisation, this heavily influenced the thinking of development agencies as an instrument of the West's development engagement with lower income countries. With infrastructure provision becoming inextricably linked to international trade, finance and development philosophies, some examination of the tide of development is warranted.

At the core of modernisation theory is the belief that society evolves through a range of stages, starting with traditional lifestyles, and ending with an age of high mass consumption, according to W.W. Rostow in his 'Stages of Economic Growth: a Non-Communist Manifesto' (Rostow 1959, p. 7). To get from one state to the other required having physical infrastructure, political institutions, and education as major ingredients for growth. Consequently, interventions by the World Bank during the 1950s and 1960s were oriented around these elements. Later however, dependency theory and world systems theory challenged some of the underlying assumptions of modernisation theory, arguing that a one size fits all approach to development was unhelpful. Instead dependency theory was very much focused on the relationship between first and third world political and business elites, which enriched a few, but left many worse off than they were before. Modernisation theory was also criticised for assuming that the export of Western standards would solve the problems of developing countries. It can be seen now that modernisation theory has been discredited (Woolcock 2009, p. 5), for despite efforts to improve education, institutions, and infrastructure, many low income countries remained poor (Leys 2006, p. 112). Nonetheless, proponents of modernisation theory could not look to themselves to find the reasons for its failure. Instead there was an inclination to "blame the victim" (Evans 1979, p. 15). As infrastructure was a cornerstone of modernisation theory, it is understandable that the value of infrastructure investment was questioned.

Modernisation, dependency, and world system theories all gave way to the structural adjustment programmes mentioned in Section 3.1.2 from 1981 under the Reagan and Thatcher administrations in the United States and United Kingdom, respectively. International financial institutions were encouraged to focus less on the state, and more on the development of free markets. Their efforts gave rise to structural adjustment agreements under which governments agreed to deregulate and liberalise along the lines of the New Zealand model of New Public Management (NPM), so that economic growth could be promoted without increasing public sector debt burdens. This led to a

marked reduction in investment in public services, such as economic and social infrastructure and, interestingly, growth rates suffered (Abouharb and Cingranelli 2007, p. 4).

Human rights also suffered according to research by Rodwan Abouharb and David Cingranelli in their book “Human Rights and Structural Adjustment” (Abouharb and Cingranelli 2007, p. 138). In part, this is because liberalisation and globalisation go hand-in-hand, which put downward pressure on wages and workers rights in order to remain competitive. Consequently, structural adjustment programs caused governments to have less respect for human rights, and this came ultimately at the cost of economic development outcomes. Infrastructure receives its fair share of criticism in this context because, as the next chapter explores, a reduction in public funds for infrastructure led to an increase in private finance for infrastructure. Not all privately financed projects delivered net benefits to governments and efficiency gains have sometimes come at the cost of additional burdens borne by low income groups (Estache and World Bank 2004, p. 20).

The backdrop to all these themes and an orientation toward economic growth since the 1960s is the primacy of neoliberalism. The consequences for infrastructure have been profound reform, which is considered next.

### **4.3 Contemporary Themes in Infrastructure Reform**

Cellphone service is widely available in [India] at low cost because it was regarded as a luxury and therefore left to the market, while electricity is hard to obtain because it has been regarded as a necessity and therefore managed by the government. Quoting economist Martin Feldstein in an essay to the Wall Street Journal of 16 February 2006. (Greenspan 2008, p. 321)

#### **4.3.1 Deregulation and Privatisation**

We have seen that strong public involvement in infrastructure dominated thinking about infrastructure provision after World War II, and that neoliberal influences took effect in the 1970s. This was felt first in the United States, whose model of strong regulation over privately run infrastructure businesses was effective until it could no longer be demonstrated that the country would remain internationally competitive without serious industrial reform (Joskow and Noll 1994, p. 391). Transportation was the first sector to be addressed through deregulation acts between 1978 and 1980 for airlines, railways, and trucking (Kessides and World Bank. 2004, p. 32). This was followed by



telecommunications deregulation in 1984. Until then, AT&T was heavily regulated on local calls, but less so for long distance calls. Consequently, it exerted its market power in long distance calls and enjoyed super profits without the service improvements that competitive pressure would have caused. AT&T was also able to block access to third party providers, stifling competition. The Department of Justice concluded that regulation alone would not lead to suitable outcomes for consumers, so it forced the break-up of the company to create a range of competing entities (Schwartz 1997, p. 20). These came to be known as the “Baby Bells”.

On the other side of the Atlantic, Margaret Thatcher’s Conservative government in the United Kingdom privatised British Telecom at the same time as AT&T was split up. Large State assets, notably British Petroleum, had been sold off before then, but they were already operating in a competitive market so little was needed to create a competitive environment for those organisations. British Telecom, by contrast, presented a very different situation and required substantial reform as a pre-cursor to privatisation (MacGeorge 2004, p. 1).

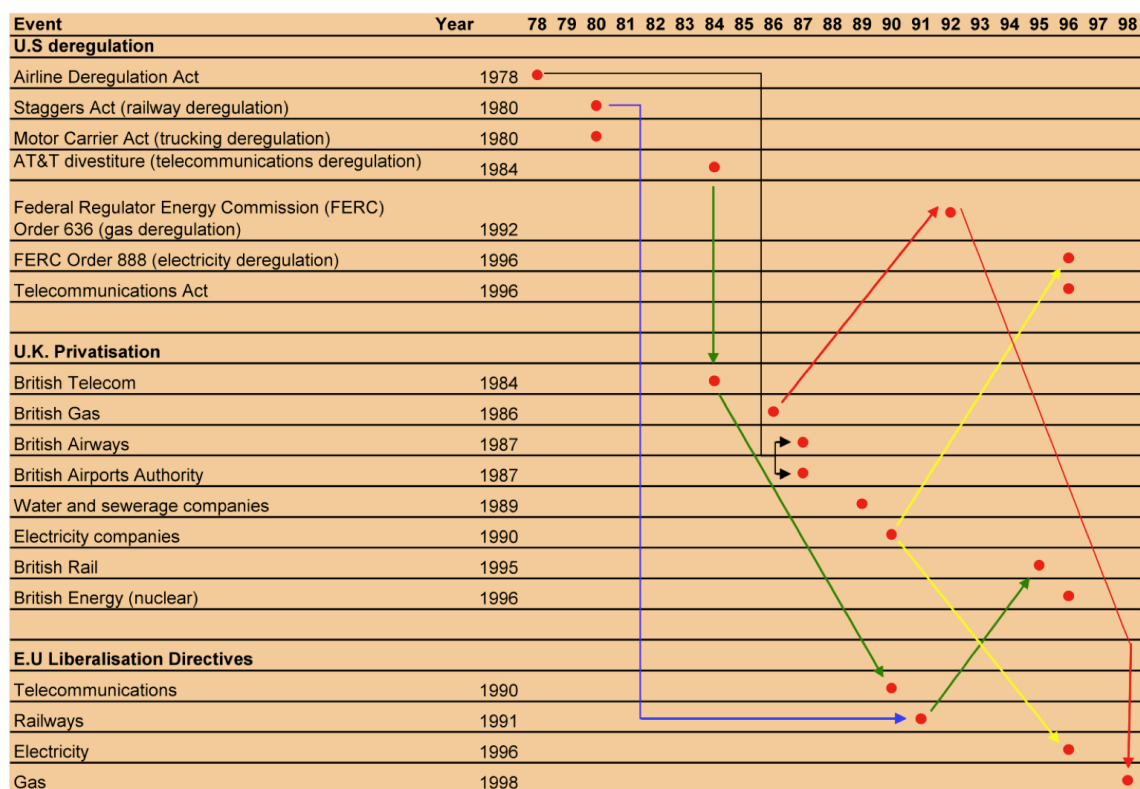
The privatisation of British telecom was not motivated primarily by the hope of efficiency gains, better services or prices for consumers. Instead, it was designed primarily to reduce public sector borrowing (Green and Haskell 2000, p. 11), (Kay, p. 8) and (Kessides and World Bank. 2004, p. 31). Access to capital markets, labour reform and the protection of consumer interests proved to be very beneficial, but largely unintended, consequences of privatisation. In fact, it has been proposed that the benefits of privatisation came more from pre-sale reforms than through the transfer of ownership itself (Green and Haskell 2000, p. 30).

Privatisation raised some significant issues because, in the absence of benign ownership or competition, monopoly providers of infrastructure services needed to be regulated. Ironically, as the U.S was deregulating businesses that operated in a competitive environment, British reforms concentrated on State asset sales and the imposition of regulations and regulators. These centred on a statutory regulator being established and the revenues of the privatised company being capped by inflation less an efficiency factor “X” (Green and Haskell 2000, p. 14). The CPI-X form of regulation, as it was known, became the basis for regulation of other privatised utilities in the United Kingdom, such as gas, water, electricity and railways (Kay, p. 21).

While the U.S was deregulating and the U.K was restructuring and privatising, the European Union issued a number of directives aimed at liberalising infrastructure. Handily, these avoided the question of ownership. To help understand the parallel processes going on between these infrastructure reformers, Figure 3 below illustrates the reform milestones between the U.S, U.K and E.U.

Privatisation, deregulation and liberalisation are all variations of a neoliberal theme aimed at giving the private sector a greater role in areas that had hitherto been seen as a public preserve. Each approach also required government to grapple with finding the balance between competition and regulation and to question whether interventions would ultimately deliver net benefits. UK privatisation, for example, brought its benefits, but results were mixed. A 20 percent productivity uplift was generally associated with these privatisations, but unemployment was often caused too. Nor did all, like Noll (2000) or Laffont et al. (2000) agree that pre-privatisation restructuring is beneficial, but it is generally accepted that privatisation without competitive restructuring is a “first trap” (Kessides and World Bank. 2004, p. 59). What is meant by this is that an organisation that is to be privatised might as a whole be a monopoly, but some of its components might also operate in a competitive environment. The electricity sector is a good example in this regard because generation and electricity retailing can each operate on a market basis, but transmission and electricity distribution businesses cannot. They are natural monopolies because there is no economic efficiency in having two competing transmission or distribution lines running alongside each other. The message in this respect is that competition should be maximised first and whatever is left over needs regulation, which is a next best alternative to competition.

**Figure 3 – Milestones in Infrastructure Reform in the United States, United Kingdom and the European Union**



Source: Modified from Kessides and World Bank (2004, p. 32)

Despite reforms in the North, liberalisation was not generally seen in the South as a solution to the rising demand for infrastructure in the 1980s and 1990s. That demand was led by population growth and the challenge for developing economies, especially in Asia and Latin America, was to find ways to finance and develop new infrastructure rather than simply finding ways of managing existing infrastructure better and reducing public debt. As national budgets did not have the capacity to keep up with the capital needed to finance new infrastructure, a new approach was needed and the private sector was to play a key role. The term “Private Participation in Infrastructure” or “PPI” was eventually coined to cover situations where private sector interests were engaged to deliver infrastructure. As we see in the next section, this was not the same as privatisation.

#### 4.3.2 Private Participation in Infrastructure (PPI)

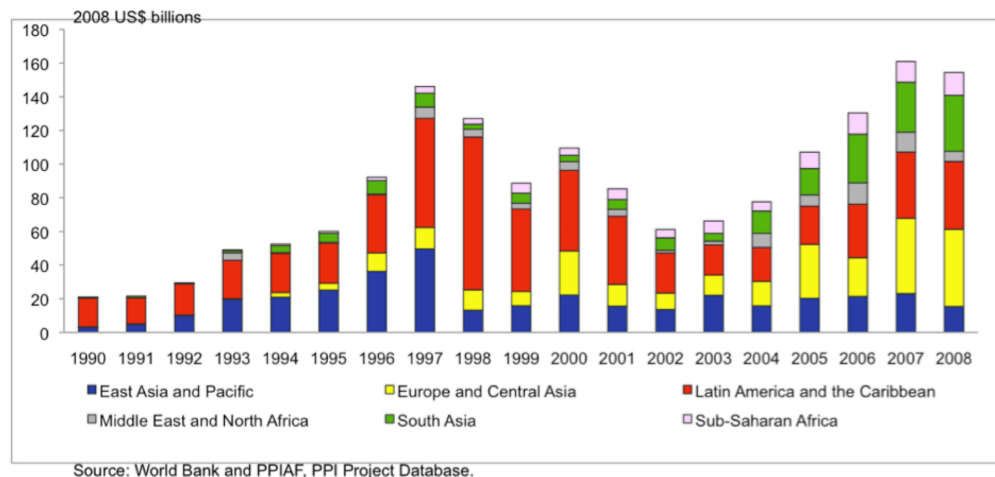
The principal form of PPI in developing countries was the financing of an individual, yet to be built, infrastructure asset. Typically a public agency would engage a private sector consortium through competitive bidding to build and operate a project that could

be run as a standalone business, the idea being that government could have a public service delivered without having to finance the underlying asset itself. Private sector actors quickly worked out that maximising the amount of debt that a project could sustain would lead to higher returns to themselves and/ or the ability to offer a better price to the public buyer during the bidding process.

Private participants naturally did not want to guarantee the loans themselves in case the project failed, which would leave them carrying unsustainably large amounts of debt on their balance sheets. To address this problem and to enable large projects to be developed privately, private infrastructure investors employed a form of financing that had been used since the times of ancient Greece and Rome, referred to as “limited recourse financing”. This form of financing sees lenders sharing in the risk of the project’s failure and, if so, having only some access to the project’s developers if it fails. In modern times, limited recourse financing techniques were used to finance the capital intensive projects needed to develop the North Sea oil fields, especially in Britain. This form of financing evolved to become known as “project finance” and the centre of the project finance world during the 1980s became London, helped by most U.S investment banks having relocated there after the Great Depression and, more especially, in response to the Glass-Steagall Act of 1933. As others learned of the technique, such as in Australia for the financing of the Woodside North-West Shelf oil and gas project (which was the world’s largest engineering project at the time) expertise had to be flown in from London. However, it was not long before banks in London were establishing project finance capabilities in Singapore, Hong Kong, New York, Sydney and other major financial centres.

In Asia, a wave of project financing between 1990 and 1997 led to substantial new infrastructure investment, which faltered from 1997 when the Asian Crisis started. In part, the Crisis occurred because of the very large volumes of external debt being taken on by private borrowers in Asian countries, much of which was applied to project financed infrastructure. This was compounded by certain countries (such as the Philippines, Indonesia and Thailand) pegging their currencies against the US Dollar, which proved to be unsustainable. Figure 4 below shows this rise and fall in PPI investment through the 1990s and early in the new millennium.

**Figure 4 – Volume of PPI Infrastructure Investment from 1990–2008**



Source: World Bank and PPIAF, PP Project Database.

By the time the Asian Crisis took hold, project finance as a means of financing infrastructure in developing countries was very well established. However, project financing had also fallen short in a number of areas, not least being that they are highly customised and require large teams of skilled professionals to pull them together (MacGeorge 2002, p. 2). Even then there are no guarantees that the project in question will reach fruition and projects that have gone wrong have been highly visible. Several high profile cases include the M1/M15 Toll Motorway Project in Hungary, the Cochabamba Water System in Bolivia and the Don Muang Tollway in Thailand. To some extent, these failures resulted from shortcomings in the business cases put together by the project developers. However, more often than not the failings had their beginnings in the public sector as a result of poor project selection, procurement failings, inadequate legislation and institutional problems (Cuttaree 2008, p. 7).

Ironically, a concession-based infrastructure project can make up for poor legislation by having a more comprehensive concession agreement that closes legislative gaps. A typical concession agreement in a developing country might run to several hundred pages whereas a concession agreement in a developed country with robust legislation could be dealt with in several pages only. This situation led to substantial amounts of work for project finance lawyers and financiers and enabled many infrastructure projects to be developed, but it did not address the root cause of inadequate legislation.

Partly because project financing documentation acted as a stopgap for inadequate legislation, by the late 1980s much of the world's project finance capabilities were

focused on developing countries, mostly directed towards assisting private sector actors. In Europe, privatisation had come and gone but the demand for new services had not. The benefits of engaging with the private sector for the financing of new infrastructure were well understood, but there was general recognition, particularly in the United Kingdom, that the public sector had a major role to play in setting the framework to ensure good project outcomes. As part of that streamlining, there was a desire to improve public sector capacity to deal with private sector developers, develop standardised procedures and documentation to minimise development costs and increase the chances that the public sector would negotiate consistent terms with the private sector. The aim was to address a trap that governments had fallen into, thinking project financing means they can transfer project risks to the private sector while still procuring a new public service. This had led to concession based projects often transferring a disproportionate share of the risks onto the private sponsor, not helped by undue competition for projects (MacGeorge 2002, p. 2). This was unhealthy because developers can sometimes offer unsustainable terms to public buyers in their bid to be successful, and this might only become clear after the contract has been awarded and the project has started. Irrespective of the causes of imbalanced risk sharing, a frequent consequence were delays in the development of project agreements, difficulties in raising finance for projects and a number of cancelled or failed projects along the way (Shavinina 2003, p. 543).

These are the issues that the British government sought to address from the early 1990s, by creating a public sector hub of expertise, standard documents and processes, and a transparent procurement process. These efforts formed part of the Private Finance Initiative (PFI), which aimed to develop a systematic programme for infrastructure development rather than developing infrastructure on a piecemeal basis, as had been the trend to that date. In parallel with those developments the Asian Crisis had come and gone, leaving many developing countries in a difficult position as the supply of capital dried up. At this juncture, it is worth exploring what public development agencies had been doing in the infrastructure area and how they addressed this capital shortage problem before returning to the developments in the UK and how they have shaped infrastructure policy more recently.

### **4.3.3 The Involvement of Public Agencies in the Financing of PPI Projects**

To understand the role of public agencies in the financing of infrastructure projects in developing countries, requires a discussion regarding how international aid is funded and administered. There are two sources of funding for international aid and these are government and private citizens. Government funding comes in the form of official development assistance (ODA) and this is discussed in more detail below. About 70 percent of ODA funding is channelled through individual country programs and most of the balance is managed by multilateral organisations like the United Nations agencies and regional development banks. A relatively small proportion of ODA funding is directed towards NGOs, which also administer most private donations (Reeve 2007, p. 283).

A donor government provides, bilateral aid to a beneficiary government, such as from the United States through its aid agency, USAID, to the government of Vietnam. The United States government in this case will have developed a country programme with the government of Vietnam that sets out agreed aid objectives, the measures required to achieve those objectives and the funding that is needed. Ideally USAID will work alongside other donors to ensure that their various programs are coordinated and harmonised. Funding comes in the form of technical services to provide consulting services to governmental agencies, or loan and grant funding for goods and services. These are usually directed through specific projects, which may themselves be made up of a series of subprojects. As an example, to expand a country's wastewater system may require drafting a policy statement, amending existing legislation, some institutional reorganisation, planning for expanded services and procurement for the delivery of those services. These need to be ordered and sequenced in a logical manner, and a variety of different skill-sets are required to produce the project outcomes.

Consequently, it is best that the overall project is broken into a series of packages. In some cases the whole project will be financed by a single agency, while in other cases finance will come from a range of agencies. In any event, bilateral funding is provided on concessional terms using a definition determined by the Organisation for Economic Cooperation and Development (OECD) and this is appealing for countries that have limited capacity for raising capital and paying for the cost of that capital (OECD 2010).

When it comes to multilateral organisations it is worth focusing for a moment on the World Bank, which is the single largest manager of ODA funds (Reeve 2007, p. 285).

The World Bank is not a single organisation but a group of organisations, specifically the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), the Multilateral Investment Guarantee Agency (MIGA) and the International Committee for the Settlement of Investment Disputes (ICSID). The most important of these organisations from an infrastructural viewpoint are the IDA and the IBRD, which are focused on the poorest of countries and middle income developing countries respectively. Most of these countries have difficulty raising finance from the international capital markets on reasonable commercial terms, if at all. In this respect, the World Bank Group and regional development banks play a role in providing knowledge, technical assistance funding and direct funding for infrastructure through grants, loans, and guarantees.

Development banks have an objective to maximise the amount of finance that can be leveraged from other sources such as the commercial markets and this is referred to as co-financing (Asian Development Bank 2006, p. 5). In turn, commercial providers of finance take much comfort from the involvement of public agencies because they then enjoy the strength of a government to government type relationship that is particularly helpful when projects go wrong (PricewaterhouseCoopers 2003, p. 25).

These co-financing relationships are better understood by public and private organisations today than in the 1980s and 1990s when public agencies, with the exception of Export Credit Agencies (ECAs), essentially did not feature as far as private sector infrastructure investment was concerned (World Bank 2003, p. 2). Thus, during the 1980s the private sector rallied to the opportunity of investing in infrastructure through project financing techniques, however the role of international financial institutions was far less clear. There was, for example, a substantial difference between the activities of multilateral agencies by comparison to bilateral agencies. This latter group is represented not only by ODA but also ECAs and, of these two groups, ECAs have had the most significant involvement in infrastructure. This may be contrary to what is commonly thought so it is worth pausing to examine each major type of public lender for infrastructure so that their roles are understood better.



#### **4.3.3.1 Official Development Assistance (ODA)**

ODA is a construct of the OECD's Development Assistance Committee (DAC) which was established in 1961. The concept of ODA was adopted in 1969, creating a separation between the OECD's "Other Official Flows" so that governments could provide specific assistance to developing countries by making finance available on a concessional basis (Helmut 1996, p. 21). For clarity, ODA does not include export credits, which are discussed in the following section.

OECD member countries have an agreed objective to contribute 0.7 percent of their Gross National Income (GNI) toward ODA, but all except a few fall well short of this objective. Table 2 below shows the average contribution by OECD members is 0.31 percent of GNI. Only five countries meet their commitments and the United States, which in absolute terms is the greatest contributor of ODA, is one of the lowest contributors in GNI terms.

**Table 2 – Contributions of OECD countries to ODA as a percentage of GNI**

Year	2004	2005	2006	2007	2008	2009
<b>Total</b>	<b>0.25%</b>	<b>0.32%</b>	<b>0.30%</b>	<b>0.27%</b>	<b>0.30%</b>	<b>0.31%</b>
Sweden	0.78%	0.94%	1.02%	0.93%	0.98%	1.12%
Norway	0.87%	0.94%	0.89%	0.95%	0.88%	1.06%
Luxembourg	0.79%	0.79%	0.89%	0.92%	0.97%	1.01%
Denmark	0.85%	0.81%	0.80%	0.81%	0.82%	0.88%
Netherlands	0.73%	0.82%	0.81%	0.81%	0.80%	0.82%
Belgium	0.41%	0.53%	0.50%	0.43%	0.48%	0.55%
Finland	0.37%	0.46%	0.40%	0.39%	0.44%	0.54%
Ireland	0.39%	0.42%	0.54%	0.55%	0.59%	0.54%
United Kingdom	0.36%	0.47%	0.51%	0.36%	0.43%	0.52%
Switzerland	0.40%	0.43%	0.39%	0.38%	0.44%	0.47%
France	0.41%	0.47%	0.47%	0.38%	0.39%	0.46%
Spain	0.24%	0.27%	0.32%	0.37%	0.45%	0.46%
Germany	0.28%	0.36%	0.36%	0.37%	0.38%	0.35%
Austria	0.23%	0.52%	0.47%	0.50%	0.43%	0.30%
Canada	0.27%	0.34%	0.29%	0.29%	0.33%	0.30%
Australia	0.25%	0.25%	0.30%	0.32%	0.32%	0.29%
New Zealand	0.23%	0.27%	0.27%	0.27%	0.30%	0.29%
Portugal	0.63%	0.21%	0.21%	0.22%	0.27%	0.23%
United States	0.17%	0.23%	0.18%	0.16%	0.19%	0.20%
Greece	0.16%	0.17%	0.17%	0.16%	0.21%	0.19%
Japan	0.19%	0.28%	0.25%	0.17%	0.19%	0.18%
Italy	0.15%	0.29%	0.20%	0.19%	0.22%	0.16%
Korea	0.06%	0.10%	0.05%	0.07%	0.09%	0.10%

Source: <http://stats.oecd.org/qwids/>

In the 1970s, the DAC adopted a “Statement on Development Co-operation for Economic Growth and Meeting Basic Human Needs”, which emphasised economic development as a path toward meeting human needs (Helmut 1996, p. 30). The areas that were identified for particular support included modernisation, *provision of infrastructure* and industrialisation, all neo-liberal themes. In any event, infrastructure

received (and continues to receive) a large proportion of ODA funding. In 2008, for example, the total committed amount of ODA funding was USD 158 billion, of which USD 64.6 billion or 41 percent was directed toward infrastructure. Large as that might appear, research conducted by the UK's Department for International Development found that during the 1990s ODA funding contributed to just 5-10 percent of overall infrastructure spending by developing countries (Briceño-Garmendia, Estache et al. 2004, p. 17).

Supportive of development that ODA is, it is an area that receives some opposition. Much of the criticism of ODA is the relationship between aid funding and the diplomatic, economic and commercial objectives of donor countries. Japan has been singled out for its fair share of criticism because the blurring of lines between these various interests has been perceived as being the most overt. This is partly because Japan is the only country that has deliberately included the private sector in its policy development process (Arase 1994, p. 172). It is also because Japan has favoured capital intensive projects like infrastructure over other sectors because Japan's industry is geared to supporting those projects and this was found to be so in a study of the linkage between Japan's ODA and foreign direct investment in China (Blaise 2005, p. 54). It is no surprise therefore that the Japan Bank for International Cooperation was formed by merging the ODA and export credit arms of the Japanese government and that JBIC (now JICA) is one of the most significant participants in the financing of developing country infrastructure.

JICA aside, the ODA functions of DAC countries have been influential in infrastructure delivery but usually less involved in the financing of the infrastructure itself. Instead they have provided funding for technical assistance that has helped governments in developing countries further their policies and plans for infrastructure development. Direct bilateral funding of infrastructure is left to export credit agencies.

#### **4.3.3.2 Export Credit Agencies**

Export credit agencies were established by governments of the major industrialised countries in the 1930s and, less importantly, some private organisations to provide financial assistance through the provision of credits and guarantees to exporters, aimed at helping to secure orders from overseas buyers. They are influenced as a group by the Berne Union, which is an international organisation established in 1934. The original

purpose of the Berne Union was to facilitate the flow of information amongst export credit agencies, so it became like an industry association. To give structure to the activities of export credit agencies the members of the OECD negotiated the “Arrangements on Guidelines for Officially Supported Export Credits”, which is also known as the Consensus (OECD 2004). That consensus governs officially supported export credits that have a term of more than two years, which is significant for infrastructure because of its need for very long-term funding.

Export credits have been a particularly important tool for the financing of infrastructure projects, particularly those that rely on a very high level of equipment to be imported by the country developing a given project. For example, around 70 percent of the capital costs of a combined cycle gas turbine project that will generate electricity might relate to the turbines, generators and other main plant. These turbines and generators are manufactured by only a few countries led by the United States, the United Kingdom, France, Germany and Japan. Generally speaking about 85 percent of the cost of those generators is eligible to be financed by the export credit agencies from which the equipment will be sourced (OECD 2004, p. 9). On the basis that a project costing USD 100 million involves about \$20 million for financing and \$80 million in capital costs, this means around \$56 million is eligible for export credit and 85 percent of this amount equals \$47.6 million. It can be seen, therefore, that an export credit might finance close to half a project’s cost.

Where export credits were originally designed to help manufacturers secure orders to export their goods and services, over time it became clear that manufacturing those goods and services in countries with cheap labour was more beneficial to a manufacturer’s shareholders. However, by moving manufacturing to a developing country the opportunity to benefit from export credits is reduced because many developing countries do not have export credit agencies themselves. One answer to this, developed particularly by Japan through its export credit agency, Japan Exim as it was then named, was to make investment eligible for finance. In Japan’s case, these were referred to as Overseas Investment Credits and this would give a Japanese investor in an overseas project a competitive edge and leverage by comparison to other manufacturer/investors.

While export credit agencies provided close to USD 300 billion a year in the insurance and funding of international trade, much of which is directed towards infrastructure,

export credits have a number of detractors. They caution against corporate welfare, export credits as an instrument of foreign policy, tied aid, the support of governments that are unable to raise capital because their political risks are too great, quasi military interventions and environmental damage (ECA Watch 2010). On the first of these concerns it is fair to say that governments have “picked winners” and supported large exporters at the expense of smaller organisations and economic activity that might have been better directed elsewhere (Vasquez 1997, p. 1). However it is the balance of the accusations that are rather more grave because Northern interventions that have come at the expense of countries in the South are much harder to countenance.

Organisations such as ECA Watch have railed against activities such as the United Kingdom’s export credit agency providing loans to the government of Indonesia to purchase jet fighters that were used by the Indonesian military in East Timor. They have also provided a powerful voice on environmental issues, particularly regarding export credit agency support for hydropower projects such as the Three Gorges project in China, the Ilisa Dam in Turkey, the Mashewar and Tehri dams in India and the San Roque project in the Philippines (Gorlach, Knigge et al. 2007).

It is no surprise the ECA watch describes ECAs as “strategic development linchpins that play an enormous part in the harmful impacts of corporate globalisation” (ECA Watch 2010, p. 1). Fortunately, the activism of ECA Watch and others have led to a range of positive developments regarding the conduct of export credit agencies. In 1997 an international campaign to hold export credit agencies to account was started with the support of organisations like the WWF, Amnesty International, Friends of the Earth and the International Rivers Network. Significantly, in 2000 around 350 NGOs agreed to what is known as the Jakarta Declaration, which is a statement of the objectives these organisations have for ECA reform (ECA Watch 2010, p. 4). They include: increased transparency; a commitment to common environmental and social standards; specific criteria regarding human rights; measures to reduce corruption; a commitment to not support the financing of arms; and cancelling ECA debt for the poorest countries. Of these objectives, there has been much progress made with regards to strengthening environmental conditions. For example, in 2003 the OECD adopted stronger environmental conditions for export credits that are harmonised across all agencies. These conditions included the adoption of World Bank environmental standards (OECD 2003, p. 1).

Export credits are not entirely harmful because they have also underpinned much economic activity that has occasioned the betterment of many people in the South. However, it is not possible to shy away from the primary objective of export credit agencies to help their own industry to trade internationally. What is clear then is that export credits have a valuable role to play in the financing of infrastructure, particularly in developing countries, provided human rights together with social and environmental considerations are properly and transparently taken into account. Controls are therefore needed to ensure that the resulting projects are consistent with the development objectives of the host country. The merging of export credits and official development assistance functions of governments into single agencies is helpful in this respect. Furthermore, it is likely that export credit assistance will align with the country's development objectives if the export credit is provided alongside finance from the development partners of that country, such as the World Bank. This assumes of course, that the development objectives agreed with the World Bank and other partners are the true objectives of the host country. This means that the role of multilateral agencies is increasingly important in the infrastructure financing, but we are yet to see if those agencies are fully up to the challenge. This is the subject of the next section.

#### **4.3.3.3 Multilateral Agencies**

Multilateral agencies were slow to catch up with the way that infrastructure finance evolved in the 1980s and 1990s. Throughout the 1980s the World Bank was a major lender to infrastructure projects, but this lending was largely separate to what was going on in the fast growing project finance world. The Bank in its Infrastructure Action Plan put to its board in July 2003 acknowledged that as the project finance industry grew in the 1990s it moved away from lending to infrastructure projects directly and provided assistance to governments to help them build their public-sector capacity to deal with infrastructure instead. The funding for the assistance was much less capital intensive, being mostly of a technical assistance nature. Consequently, World Bank lending to IBRD countries for infrastructure projects fell by 50 percent between 1993 and 2002, although some elements of the Bank (such as the IFC and MIGA) did see some increased infrastructure activity (World Bank 2003, p. 2). While international commercial banks and export credit agencies led the financing of PPI projects, the World Bank appeared to be absent. Again, the Infrastructure Action Plan recognised that:

the decline was exacerbated by other internal bank group factors, such as a lack of clarity on the roles of the private and public sector and infrastructure service provision and underinvestment in country level infrastructure diagnostic work. High preparation costs, risk aversion among staff, corporate signals on infrastructure, and a move towards programmatic lending contributed to a reluctance to take on infrastructure projects. These and other internal and external factors have led to under representation of infrastructure in [Country Assistance Strategies] and [Poverty Reduction Strategy Papers] (World Bank 2003, p. 2)

An exception in the 1990s and one that which proved pivotal to the Bank's engagement with PPI in later years was the World Bank's support for the Hub River power station project in Pakistan, which was project financed in 1994 (Baughman and Buresch 1994, p. 5). The USD 864 million Build Operate Transfer (BOT) project was unique in that it was a co-financing arrangement involving private sector lenders and investors, export credit agencies and the World Bank. The World Bank's role was in the provision of USD 589 million in loans and guarantees, which was unusual in that the World Bank normally provided funding strictly to governments. On this occasion the World Bank was able to support the project indirectly by routing its loan through the Government of Pakistan's private-sector development fund. In addition to the USD 258 million loan, a USD 240 million guarantee was provided for the benefit of the projects lenders, which was also an uncommon arrangement. At the time this structure was referred to as an Enhanced Co-Financing scheme and later it formed the basis for the World Bank's guarantee programme for infrastructure (Matsukawa and Habeck 2007, p. 4).

In 2003 the World Bank acknowledged the decline in private investment in infrastructure after the Asian crisis from a peak of USD 128 billion in 1997 to USD 58 billion in 2002 (World Bank 2003, p. 2). Coupled with this was the focus on the Millennium Development Goals, which require investment in infrastructure if the goals are to be realised (Leipziger, Fay et al. 2003, p. 10). Of the eight goals, reducing poverty and hunger, universal education, improving health outcomes for children and mothers, and environmental sustainability all have infrastructure dimensions. Consequently, the World Bank in its action plan decided to change its business model so that it could respond better to client country demand for infrastructure by increasing its analytical efforts and by maximising leverage of private finance infrastructure through the use of new and existing instruments. In this latter respect, it was decided to establish a new Department for Private Participation and Finance, combining the Project

Finance and Guarantees Group and the Private Participation and Infrastructure Unit (World Bank 2003, p. 9). This development was followed in 2006, when the World Bank announced that it would merge its Infrastructure Network with its Environmentally and Socially Sustainable Development Network. The new group, called the Sustainable Development Network, was a signal that sustainable development would be mainstreamed into Bank operations. This meant that major infrastructure projects would need to be sustainable in order to attract Bank support (BICUSA 2006). In making this change, the challenges of measuring the multiple dimensions of development that have been discussed in Section 3.1.2 consequently became a reality for the Bank too.

Of the regional development banks, the Inter-American Development Bank was not historically oriented towards infrastructure lending, being driven more by social projects. This changed during the 1990s and up until 2003 when some USD 786 billion of infrastructure was financed with private participation, a degree of which involved the IADB. Many infrastructure projects were developed on a project-by-project basis however and not based on a systematic approach by governments wanting to take a holistic approach to infrastructure planning and development (IADB 2006, p. 9).

The Latin American experience was repeated in Asia. By 2006, the Asian Development Bank was also re-emphasising infrastructure and this was articulated in its Medium-Term Strategy II (Sharan, Lohani et al. 2007, p. vi). The ADB noted in its Infrastructure Operations report in 2007 that from the 1970s around half of its lending had been toward infrastructure projects. Much of that, however, was not made in collaboration with the private sector and instead was focused on “bricks and mortar” lending to governments and their ministries directly (Sharan, Lohani et al. 2007, p. 10). The ADB did, however, have some focus on collaboration with the private sector, through its Private Sector Operations Division (PSOD), but PSOD was a relatively insignificant component of ADB operations until 2002. Then a new Director-General was appointed and over the next six years support for private sector projects increased forty-fold. In March 2008, the board of the ADB decided that private sector financing would be a leading priority for the bank (Asian Development Bank 2008, p. 4).

The African Development Bank (AfDB) has historically been the least involved in infrastructure despite committing a little over a third of its resources in this area since its establishment in 1965. However, infrastructure development languished in Africa



(Farlam 2005, p. i) until 2000 when a New Partnership for Africa's Development (NEPAD) was established and as part of this the AfDB has reinvigorated its involvement in infrastructure, particularly since 2006 following the 2005 establishment of the Infrastructure Consortium for Africa and the EU-Africa Partnership on Africa (United Nations 2006), p.2]. In 2009 over half of the AfDB's loans and grants were made to infrastructure projects, but the bank continues to have a relatively small guarantee capability.

In Eastern Europe, the European Bank for Reconstruction and Development (EBRD) was oriented toward private sector development and infrastructure from its inception. Its mandate includes an express intention to be project based and to have at least 60 percent of its lending made directly to private enterprise in support of development outcomes. As the world's newest development bank the EBRD had the benefit of being established without the legacies of its counterparts. It could also be constituted based on development thinking prevailing as of the 1990s (Bronstone 1999, p. 81)

Of the multilateral development banks, the World Bank provides leadership regarding infrastructure financing as might be expected. However, the IADB and ADB have been major contributors not just in terms of regional infrastructure funding, but also in developing thinking about the way the banks should engage with infrastructure generally. The EBRD, by contrast has focussed on infrastructure lending to private sector interests and as we will see in the next section, this is very much in line with the way that developed countries have evolved their thinking regarding the provision of infrastructure (Akintoye, Beck et al. 2009, p. 136).

#### **4.3.4 Private Finance Initiative and Public-Private Partnerships**

Returning now to the evolution of project finance techniques being the tool of choice for financing projects in developing countries until the Asian crisis started in 1997, we have learned that financing projects on a case-by-case basis was seen to be flawed in Europe and particularly in the United Kingdom. The newly privatised companies and reformed sectors (most of which were infrastructure related) in Britain were now providing services directly to the public, the government had reduced public sector borrowing and had introduced regulation and efficiency targets to core infrastructural sectors such as electricity, gas and telecommunications. However, privatisation did not address the need for growing demand for infrastructural services, much of which was in

the areas of health care, education, corrections and defence. These areas of social infrastructure could not be readily privatised and operated as a series of discrete businesses. The other challenge was that the government was not in a position to increase public sector borrowing to finance the development of these new services. Consequently, some new thinking was required, the result of which was the Private Finance Initiative (PFI) introduced in Section 3.2.2.

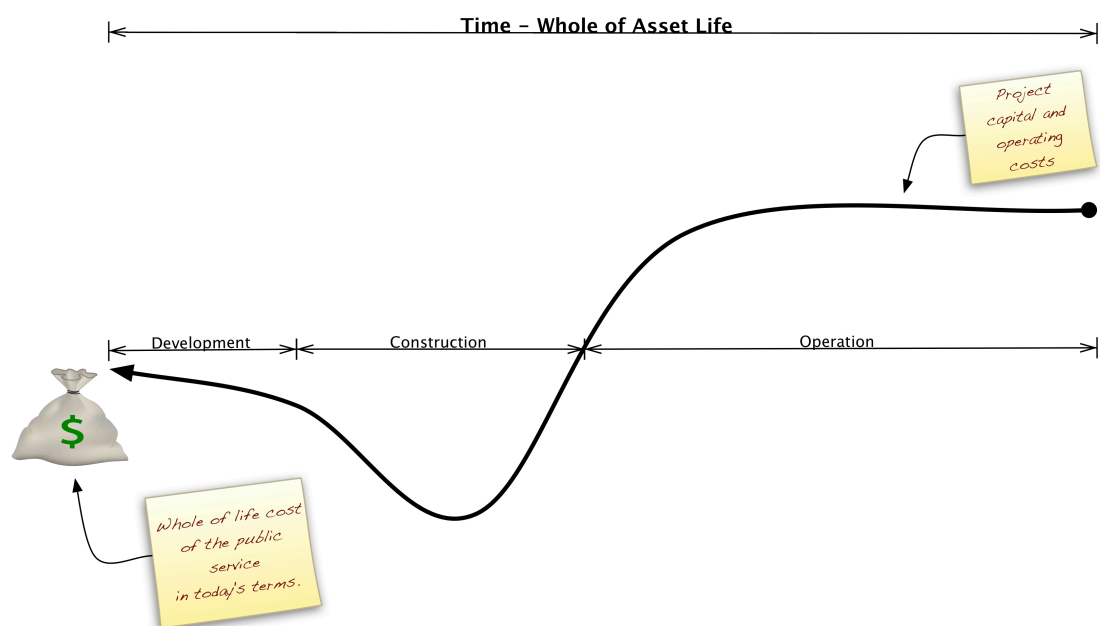
#### **4.3.4.1 The contribution of the United Kingdom toward evolving PPI standards**

The PFI was a development sponsored by Her Majesty's Treasury and established in 1992 under the Conservative government of John Major. It was immediately criticised by Britain's Labour Party as being another form of privatisation when in fact it was designed as a means of accessing private capital for the financing of public services provided by government employees. Therefore, instead of passing the role of providing public services onto the private sector through privatisation, the government under the PFI again became the service provider while contracting out those elements that the private sector does better. PFI, then, is the British name for the model that is now more widely referred to as PPP (Broadbent and Laughlin 2003).

The basic premise of the Private Finance Initiative was for the government to take more control over infrastructure outcomes. Until then the vast majority of infrastructure contracting by government followed a traditional model. This saw the government contracting for the delivery of physical works and services rather than contracting for service outcomes. This approach was not working well, for the U.K.'s National Audit Office found that over 70 percent of traditionally procured projects in Britain were completed late and over budget (National Audit Office 1999). One of the reasons for this was that many public agencies would often manage multiple contracts rather than there being a single turnkey contract being project managed by a main contractor. When a project manager is fully responsible for project outcomes, there is a more synchronous relationship between the cost to the buyer and the project manager's liability when things go wrong. A further problem was joining multiple contracts together as there is an interfacing risk of doing so. It was sometimes hard for the public buyer to see where one contractor's responsibility stopped and another started and this can be avoided with turnkey contracting. This appears to be more an argument to move from multiple contracts to turnkey contracting rather than involving the private sector more fully, but even under a turnkey contract that is procured traditionally the contractor is not

incentivised to use its knowledge to promote ways to reduce project operating costs. Nor do they necessarily have the right incentives to complete the project under budget, or to a higher specification than required by the public employer. As a result, there has been gravitation towards considering all of a project's cash flows in making decisions about procurement. It is for this reason that "life cycle" contracting has become a major theme internationally, because it creates incentives to minimise the present value total cost of a project (HM Treasury 2006, p. 32). Figure 5 below illustrates how life-cycle costs can be taken into account when considering an infrastructure investment. The figure shows that all the costs of a project over its full economic life are discounted back over time to remove inflation and arrive at an aggregate present value (PV), expressed as a single dollar value. Costs such as development, construction, operation, maintenance and de-commissioning are all taken into account. For example, Project A might have a PV of USD 50 million and Project B might have a PV of USD 75 million. Project A is cheaper overall, even though it might have a high capital cost and a relatively low operating cost. Project B might have an attractive capital cost and a high operating cost. To extend the example, a hydro power station is more like Project A and a gas fired power station is more like Project B. Therefore, making decisions about projects on a life cycle basis leads to better long term financial decision making.

**Figure 5 – Life Cycle Cost Assessment**



Source: Author

In tandem with this change in thinking about life cycle costs, the British government had come to understand from its experience with privatisation that the private sector could deliver life cycle benefits other than the provision of capital alone. It realised that in some cases there was a role for private participants, but it also needed a systematic framework to make decisions about when to involve the private sector and what role the private sector should have. Therefore, the Private Finance Initiative was perhaps less about finance and more about a structured engagement with the private sector (PriceWaterhouseCoopers 2005, p. 17).

Other lessons learned from privatisation were that handing over control of assets to private owners reduced the involvement of the State in infrastructure and to some extent caused a loss of control over infrastructure outcomes. This is an important point because government was coming to realise that it ought to be focused on outcomes rather than necessarily being involved in the provision of all the inputs needed to achieve those outcomes. The delivery of infrastructure services then became one of ensuring that the government had the right decision framework (UNECE 2001, p. 101).

Aside from the development of standardised processes and documentation as part of the Private Finance Initiative, a key development of this framework was the concept of “Value for Money” (VfM) and how this might be measured (HM Treasury 2006). A tool for measuring Value for Money was developed by Her Majesty’s Treasury and this came to be known as the Public Sector Comparator or PSC (HM Treasury 1999). The purpose of the PSC was to make judgements about whether a project ought to be carried out by the public sector, as had been done traditionally, or by the private sector. The PSC considers the life cycle cost of the public sector undertaking a project and then compares that to an estimate of the life cycle cost of private sector delivery. In either case, the project developer does not usually interface directly with the public “customer”. For example, delivery of a hospital by the private sector would usually still see the hospital staffed and operated insofar as medical services are concerned by public employees like any other State hospital.

Consequently, in a PFI project that is awarded to the private sector, the government is the planner, procurer, regulator and (as far as the public is concerned) is usually the public service provider. The private sector designs, builds, finances and operates the new service according to agreed standards. PFI contracts are typically quite long, with

the usual arrangement being the construction period plus twenty five years (MacGeorge 2002, p. 2).

#### **4.3.4.2 The transition of PFI to PPP vernacular**

Project financing of PFI projects led to development of a framework for government to systematically engage with the private sector for the development of projects under the PFI. In the early 1990s, when New Labour came to power in Britain the PFI concept became known as public-private partnership (Wettenhall 2005, p. 3). It is this latter use of the term PPP that is more meaningful, because it describes a conceptual change to the way that governments work with the private sector and even then there are no guarantees that the private sector will have a role in a PPP project. This is because some publicly owned commercial enterprises, many of which are the product of corporatisation, can also be involved in PPPs. In essence a PPP is the nexus between the State (acting socially) and a commercial organisation (irrespective of its shareholding), which acts commercially. A better term for a PPP therefore would be a social-commercial contract.

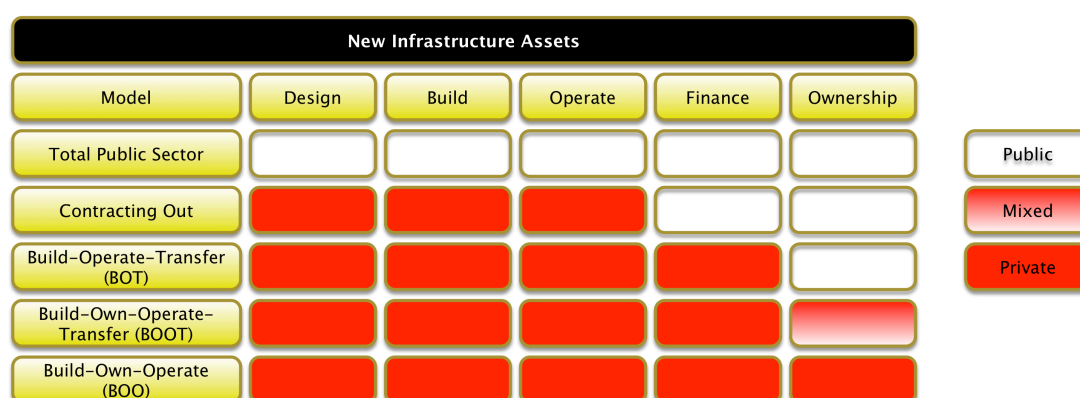
The establishment of the PFI followed soon after the Washington Consensus of 1989, which in itself had been influenced by thinking in the Reagan Administration during 1984 when there were musings about an "imaginative partnership between business and government" (Wettenhall 2005, p. 2). The Washington Consensus was the common view for reform identified by Washington DC-based institutions such as the World Bank, the International Monetary Fund and the US Treasury Department. The Consensus was oriented towards a number of policies, including trade liberalisation, privatisation and deregulation. As discussed in Section 3.2.1, as far as infrastructure was concerned in the developing world there were limited benefits that could stem from privatisation by contrast to taking a private approach to infrastructure to help address infrastructure gaps emerging as a result of very high population growth. The Washington Consensus also was concerned about encouraging developing countries to be open to development finance institutions, so it was logical that the Consensus would favour PPPs in infrastructure. This all led to the British government calling social-commercial contracts PFI and then PPPs, and development banks calling these arrangements PFI or PPP projects. As time has passed, the term PPP has been universally adopted (Broadbent and Laughlin 2003), p.338].

#### 4.3.4.3 Forms of Public Private Partnerships

Section 3.2.4 (a) introduced the principle of life cycle contracting. For a commercial partner to take responsibility for the whole life of an infrastructure project it must be responsible for design, construction, operation and financing that project. It is, however, not necessary for the commercial contractor to also own the asset because its asset is the contract with its public counterpart, which is essentially an intangible right to a future stream of cash flows. This is recognised by the International Financial Reporting Interpretations Committee (IFRIC) in its guidance regarding the implementation of service concessions, which is known as IFRIC 12 (Ernst & Young 2007, p. 22).

Therefore, PPP's come in a range of different modalities because they can fall anywhere along a spectrum that ranges between full public ownership and full private ownership and they can involve one or more of the design, build, operate and finance responsibilities. These variants differ depending on whether the asset is new (greenfield) or existing and it is perhaps appropriate to refer to all of these possibilities as a "PPP Menu" (Pessoa 2007, p. 316). Figure 6 below shows these possibilities in diagrammatic form.

**Figure 6 – Forms of Public -Private Partnership**



Source: Author

In looking at these different modalities it is important to remember that PPPs are not simply a joint venture between the public and private sectors using one of these modalities. PPPs are instead the establishment of a structured approach to procurement. Moving from a traditional procurement model is difficult because a whole new range of skills is required of the public sector. Effectively, the traditional procurement functions are transferred in the main to the private sector and instead government must re-skill so that it is able to choose the right party to build and manage an asset for what might well

be the entire economic life of the infrastructure concerned (Pessoa 2007, p. 322). The skills that are particularly important in this new context are technical, financial/commercial and legal capabilities. This, together with other challenges, has proven to be a particular problem in developing countries because of capacity and other constraints, which is explored in the next section.

#### **4.3.4.4 Limitations of Private Sector Approaches to Infrastructure**

*Developed country solutions are not necessarily a template for developing countries*

Once PPPs became firmly established and, with encouragement from international financial institutions, the approach taken in the United Kingdom was replicated elsewhere by developed and developing countries alike. However, what is best practice in a developed economy is not necessarily applicable to its less developed counterparts. The Value for Money concept and Public Sector Comparator are examples of this because the sheer volume of projects and budget limitations in high population-growth developing economies often does not allow the luxury of choosing whether to go public or private. In most cases, the State does not have financial capacity to fund all infrastructure projects and the options are then to finance them privately or cancel some projects. Therefore, the typical VfM approach (recalling that this is a decision tool to decide whether to pursue a traditional or PPP procurement) is probably inappropriate.

Referring back to Brohman's "single view of modernity" trap discussed in Section 3.1.1 and recognising that there is not a "one size fits all" approach to PPP development, the Inter-American Development Bank (IADB) developed an approach to PPP model selection that is designed specifically for developing countries. Its report, called "Financial Structuring of Infrastructure Projects in Public-Private Partnerships" is designed for water projects but it serves as an excellent model for PPP projects generally. The IADB report holds that the developed country approach to PPPs only works if (i) the government can meet its payment obligations to the PPP project concerned with almost no risk of default and (ii) the rule of law must be strong enough for the PPP partner to be assured that there is virtually no chance that the concession and other governmental agreements will be dishonoured. Consequently, the IADB approach identifies the modalities that are available to a project by considering which PPP options are not available because of "local conditions" (Vives, Paris et al. 2006, p. 7). It also considers how some of these conditions can be overcome by employing tools

such as “risk mitigation instruments”, resulting in a widening of the range of options that would otherwise be available to a project. It is in the provision of these risk mitigation instruments that international financial institutions like the World Bank and Asian Development Bank have an important role to play because they are the main providers of those instruments (PricewaterhouseCoopers 2003, p. 20). In any event, the point is that thinking that starts out in developed countries has to adapt to fit with the needs of developing countries.

We will return to the IADB approach in Chapter 5, but before then there is a case to be answered regarding whether private participation in infrastructure benefits society overall.

### **Private sector actors are not as concerned about social issues as governments**

In Section 3.2.3 we learned that the rather innocuous area of export credits is actually fraught with concerns by civil society about the impact of these facilities on human rights, the environment, and upon society. Those arguments also apply to private participation in the infrastructure of developing countries. While there may be strong arguments that can be made for leveraging the resources of the private sector to deliver services under performance based contracts, private sector involvement in infrastructure is not without its dissenters. Much of this disquiet has some basis and is directed specifically at public-private partnerships, so it is worth exploring the main concerns opponents have so as to achieve a balanced view.

As alluded to earlier, PPPs should be defined a little more clearly so that a common language is being used. In part, this is because there is a tendency for any type of public-private endeavour to be labelled as a PPP as if something new is being brought to the table. We should remember that public-private relations date back to ancient times and include the administration of the Persian Empire, privateer shipping, mercenary armies and colonial expansion (the East India Company, for example). More recently, the French developed the concession model during the mid-1800s that was the contractual basis for Generale des Eaux to supply water to Lyon, Paris and Venice. So, PPPs are not new because there have not been public – private arrangements in the past, they are new for the type of role that the public sector casts for itself and how it engages with the private sector in a structured manner (Wettenhall 2005, p.. 4-5).



The biggest squabble against private sector involvement in infrastructure is the “privatisation by stealth” argument (van der Wel 2004). Privatisation involves the transfer of ownership of a publicly owned asset to a privately owned organisation. While privatisation might be one PPP option as discussed in Section 4.3 above, governments do not usually privatise a public service and then try and call this a PPP. The concern opponents have is really directed toward the engagement with the private sector to deliver a service hitherto provided by the State. Underlying the concern is not so much the transfer of ownership but the transfer of control over the infrastructure assets needed to provide the service because the term PPP is seen as something of a misnomer (Wettenhall 2005, p. 6). End users want to know that they will receive a fairly priced service of acceptable quality, that the private provider is regulated and monitored so that it can be held to account for its non-performance, and that the provider is not acquiring rights that limit the public interest in the future.

To take a toll road as an example to test the causes of public opposition, this is an area that is particularly difficult because toll roads require payment on a per use basis and there is a stark contrast between this setup and “free” roads. There is for this reason a correlation between voter proximity to the infrastructure and political acceptance of private investment is because such projects are highly visible to the public. If toll roads carry voters, then voters also pay for electricity and gas yet these projects are far less visible to the public and are more likely to suffer from Not in My Back Yard (NIMBY) opposition rather than to the principle of private involvement.

Continuing on with our toll road project, if a company has been appointed to build and operate a new urban road for a lengthy period, then the company’s investors and lenders need to have certain assurances before they commit capital to the project. They are happy to take the commercial risks of building and operating the project, but they are likely to have concerns about patronage if there is a risk of interventions being made by government that could adversely affect the level of demand. The Don Muang Tollway in Bangkok is a very good example of this because the private concession company charged with building and operating the project had an agreement with its public counterparts that they would demolish certain flyovers underneath the new elevated toll road so that new lateral flyovers could be built. This had two important implications: for the Bangkok Metropolitan Authority the new flyovers would allow better access to the suburban areas adjacent to the new toll road and; for the concession company it meant

that users of the competing free road underneath would be encouraged to use the new toll road. When it came time for the old flyovers to be demolished, public opposition mounted and the local government lost its political will to enforce the flyover demolition, leading to a lengthy dispute with the concession company. This type of political risk continues to dog transportation projects because public administrators want to retain flexibility over urban planning and project developers want to have clarity, which leads to inflexibility. The public not wanting its future interest being compromised causes this inherent tension in some PPP projects.

The locking down of planning freedoms, while frustrating, is less challenging than consumers' mistrust of infrastructure service prices. While it might be accepted that well managed competitive tendering will lead to the most cost-effective tenderer being selected to develop a project, there is a lingering uncertainty about whether the rewards to the providers of finance are reasonable. One of the reasons for this is the belief that public borrowers can always raise finance at a lower cost than private sector borrowers and therefore the private sector can never be as cost-effective as the public sector. This is a fallacy because cost of finance is a function of risk and pricing should relate to how well risk is being managed. When an infrastructure developer is being asked to finance infrastructure on a discrete basis, not relying on income streams from other sources, then a risk management "blowtorch" is being held to that developer's proverbial feet. Public owners of infrastructure are able to allocate the project's risk across their whole portfolio and lenders know that governments can always go back to their ratepayers or taxpayers for funding if necessary. Consequently, while it appears that one can borrow more cheaply than the other a fair comparison is not being made. This goes some way to address the concerns that some opponents to PPPs have regarding profit, which is remitted to shareholders by way of dividends. Those dividends are a return for taking the risk in developing the project in the first place and the return is inherently regulated through a competitive tendering process if it is well run, and through the quality of the public sector contract that governs the private partner.

In some cases, the capacity of consumers to pay is lower than the best service price that can be offered if the project concerned is to be developed on a stand-alone basis and be financially viable. The exposure of the true cost of the service can be recast as the private sector reaping undue benefit from a project but, again, good procurement should allay those concerns. The financially viable cost of service and the "willingness to pay"

gap must still be closed and this is where government subsidisation plays a role. Even so, opponents of private sector participation in infrastructure have real difficulty over the notion of a public subsidy for privately provided infrastructure. They claim that it is unfair that there should be a transfer of taxpayers money to a private organisation, but without that transfer the private organisation will not be motivated to develop the project. In that situation government has a decision to make, which is to not develop the project at all, or to develop the project itself using a more traditional model. If the government decides not to develop the project then the social net benefits of the project will be lost. If the government decides to develop the project itself and it has been determined that is not the best party to do so then a sub-optimal outcome should logically result. Making that decision well depends on having a good infrastructure management system that the public accept is theoretically robust and is implemented transparently.

Even where governments have implemented good infrastructure management systems, the global financial crisis starting in 2008 has strengthened the arm of those opposed to private sector participation in infrastructure. They have good reason to be concerned because the excesses of the private sector and the financial services industry caused the crisis. This impacted the available finance for infrastructure too, as the reduction in investment from a 2007 peak as Figure 4 shows. What has been called into question is neoliberalism itself because through deregulation the market has been allowed to run until the point at which it has failed. Governments, led by the United States, have applied trillions of taxpayer dollars to bail out financial services firms that were considered too big to fail. Opponents of Keynesian economics like Peter Smith argued that despite the stimulus the results are not good. Effectively what has happened is that cost of the private sector failings has been transferred to government to avoid a meltdown of the international financial system. The consequent increase in government indebtedness has now placed a number of governments such as Greece, Italy, the United Kingdom and Japan in a fragile position. The risk of a global financial meltdown remains and, even if it does not occur, taxpayers will be left shouldering the burden for a generation (Smith 2010, p. 1). Where Smith makes a case for abandoning fiscal policy in response to the global financial crisis others like Kovel (2007) and Centeno (2010) believe that capitalism itself has had its day. This has profound implications for infrastructure because if the economic winds are blowing towards more government

involvement in infrastructure, it is inevitable that there will be crowding out of the private sector and a diminishing role for it in the provision of infrastructure in the future. These are not arguments for or against private participation in infrastructure, because there are wider issues at stake about on which foundations the world economy will be based in the future. Ironically however, while the mood might be toward more government involvement in infrastructure, for many governments they will not be able to make that decision because of the level of indebtedness they now carry. Therefore, while philosophically there may be an increasing preference toward public sector infrastructure investment, the private sector may well become the infrastructure financier of last resort that ends up enjoying a healthy share of the infrastructure market.

The arguments for and against private involvement in infrastructure will rage for as long as there are debates about socialism versus capitalism. What is most important is to ensure that private involvement in infrastructure is well governed. With this in mind, let us turn our attention to the importance of government Infrastructure Management Units to serve that purpose.

#### **4.3.5 Evolution of Infrastructure Management Units**

Accepting that the PPP philosophy will continue to have a place amongst the range of options that governments have for the development of infrastructure, governments must be well resourced to ensure that they are able to negotiate and enforce socially equitable terms of engagement with the private sector. Governments have recognised that specialised agencies are needed (Mark Dutz, Clive Harris et al. 2006, pp 2) to achieve that objective and today there are “PPP units” on every continent. At least 49 countries have such units, of which twenty-two are in Europe and the Middle East, two are in North America, fourteen are in Asia and the Pacific region, five are in Latin America and the Caribbean and six are in Africa. In addition there are eleven international organisations that focus on private sector participation in infrastructure. These include the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), PPP activities of the United Nations Economic Commission for Europe (UNECE), PPP activities of the United Nations Economic Commission for Africa (UNECA), the European Investment Bank, the European Bank for Reconstruction and Development (EBRD), the Bureau for Development Policy PPP Database, the World Bank Group, the International Project Finance Association, the World Road

Association, the Public-Private Infrastructure Advisory Facility (PPIAF) and the United Nations PPPs for the Urban Environment (UNESCAP 2010).

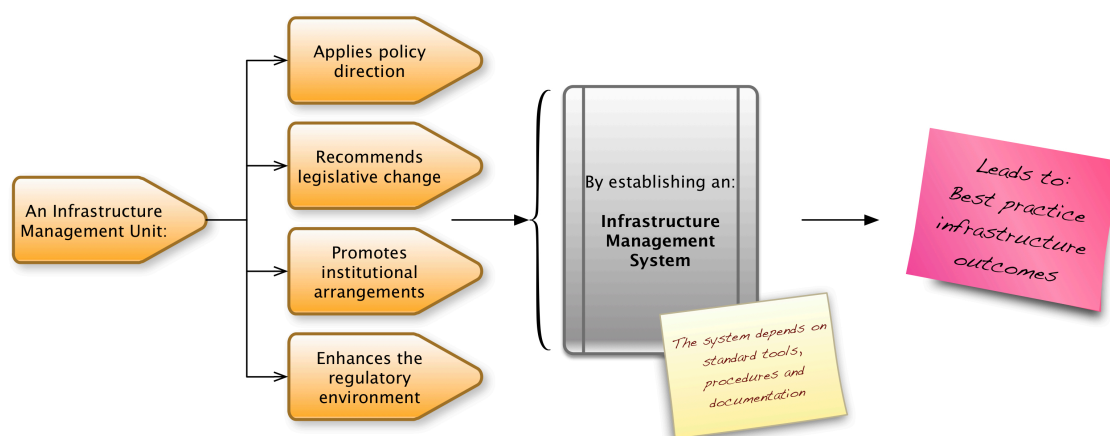
While the focus of governments around the world has been to establish public-private partnership units, we know now that a PPP is a more than simply joint venturing with the private sector for the delivery of public services. Instead PPP approaches are really about an evolving form of public-sector engagement with the private sector resulting in performance-based contracting if it can be proven that the private sector is in the best position to do the job. It is this new form of engagement as part of the application of New Public Management principles that it is at the heart of PPPs. Consequently, government infrastructure policies should not be unduly focused on private sector options, but should be directed toward a systematic process of determining who is best to develop a particular infrastructure asset. Consequently, a government infrastructure unit should not really be referred to as a PPP unit because this somewhat presupposes that a private sector option is preferred.

Today the general trend is towards the establishment of agencies that are better referred to as Infrastructure Management Units (IMU). An IMU is usually located in cross-sectoral ministries like a Ministry of Finance or a Ministry of Planning, but some standalone units have been established too. Examples of Ministry of Finance based units can be found in the United Kingdom, Australia, South Africa and Hungary. Examples of IMUs residing in planning/economic ministries include Vietnam and Indonesia. There are also cases of stand-alone units, such as the UK now that the Private Finance Initiative has evolved to include Partnerships UK, a key agency that is itself a PPP (Mark Dutz, Clive Harris et al. 2006, pp 2).

Decisions about where to locate an IMU depend on the focus that the IMU is to have. Where a financial bias is preferred then IMUs have tended to be placed in the Ministry of Finance and where a planning role is favoured the IMUs have tended to be placed in the planning ministry. However, irrespective of where an IMU is situated organisationally, the Ministry of Finance usually continues to have a strong role in policy and governance. Perhaps it is no surprise then that the recent trend is to have an IMU in the planning ministry and a risk management unit held separately in the Ministry of Finance. The reason for having this separation is that planning ministries can focus on the provision of infrastructure whilst ministries of finance can focus on how that infrastructure is financed (Mark Dutz, Clive Harris et al. 2006, p. 2).

An IMU has four primary functions. These include applying policy direction, recommending legislative changes, promoting institutional arrangements and enhancing the regulatory environment regarding infrastructure. The combination of these functions should arrive at a system that leads to output, which include standardised tools, operating procedures and documentation. Those outputs if applied correctly will lead to current best practice infrastructure management outcomes. Figure 7 illustrates how these functions interrelate.

**Figure 7 – Functions of an Infrastructure Management Unit**



Source: Author

A range of best practice themes have emerged regarding how Infrastructure Management Units are organised and operated. First, infrastructure procurement must be a systematic, transparent and competitive process that is supported by senior politicians if it is to be effective. Secondly, intra-governmental coordination must be strong, which means the roles and responsibilities between the arms of government must be clearly demarcated to minimise confusion and the risk of conflict. This is particularly important given that line ministries have traditionally had significant autonomy. Thirdly, the most successful Infrastructure Management Units such as in the United Kingdom, Australia and South Africa have strong links with their respective ministries of finance when it comes to project approvals. This is because the government has a financial exposure to each project irrespective of whether the public or private sectors carry it out. Fourthly, governance is crucial and IMU performance needs to be monitored by a board or advisory council, just like any other organisation. Fifthly, Infrastructure Management Units must have authority because when they have executive power they tend to be more effective than their counterparts that have a

purely advisory role. Sixthly, Infrastructure Management Units need to tap into a combination of public and private sector skills to have the best results (Grimsey and Lewis 2007, p. 237).

From the development of Infrastructure Management Units, comes the natural step for those units to start managing infrastructure at a national level. This has given rise to the development of National Infrastructure Plans, an obvious concept that despite the entire history of infrastructure development is only now starting to gain traction.

#### **4.3.6 National Infrastructure Planning**

It is surprising to think that the most capital-intensive activity of government has not traditionally been planned and coordinated in a unified fashion by national governments. This is partly because public expenditure is organised at a central government level by line ministries and then aggregated (after some iterations) to form the national budget. Those line ministries, such as transport, education, health, police, justice, energy and communications are each owners of major infrastructure such as roads, schools and universities, hospitals, police stations, courts and prisons and so forth. Each has traditionally managed its own sector, applying its own standards and, even until more recently, its own procurement standards. In addition to line ministries, State, regional and/or local governments are also major owners of infrastructure, particularly roads, water and wastewater facilities and solid waste facilities. They too have had a degree of autonomy with regard to infrastructure decisions. Consequently, a centralised and top-down approach to organising infrastructure at a national level has not until quite recently been adopted by any country, other than for very small economies.

The concept of National Infrastructure Planning is therefore a relatively recent one. Only a few countries have developed or are developing a National Infrastructure Plan and these include Costa Rica, New Zealand, Mexico, Timor Leste, Tonga, the United States and Zimbabwe. However, the move towards more centralised planning of infrastructure has been foreshadowed by the establishment of national infrastructure organisations, starting with Infrastructure Canada being established in 2002 and followed by Infrastructure Australia in 2008. Each of these countries is organised by provinces or states, adding an extra level of government and therefore a heightened need for coordination within the public sector. In 2010, the United Kingdom followed

suit when it was announced in the government's budget that a Infrastructure United Kingdom would be established and its first task would be to develop a National Infrastructure Plan (NZCID 2008, p. 12).

One of the issues facing National Infrastructure Planning is whether to take a top-down or bottom-up approach. Plans developed so far have erred towards the latter approach because it is easier to aggregate the existing plans of local government and line ministries than to challenge the status quo. The recently completed National Infrastructure Investment Plan for Tonga took a blended approach by considering the high level drivers for infrastructure, reviewing national development objectives and establishing a multi-criteria analysis tool that was used for prioritising sectors and projects (Government of Tonga 2010). This was then applied to initiatives being put forward by infrastructure owners to arrive at a series of project priorities. The process exposed the country's fragile national debt position as a constraint to new investment. In doing so, it was also determined that much progress can be made with Tonga's infrastructure simply by managing the existing infrastructure base more effectively. It was found that many management improvements could be achieved simply through improving human capacity, particularly around asset management. One of the major advantages of the plan is that it highlights issues facing all infrastructure subsectors, which are better addressed holistically rather than on a piecemeal basis.

The challenge for National Infrastructure Planning therefore is to establish a robust planning framework that is appropriate for all National Infrastructure Plans, while allowing flexibility to reflect local conditions. It is likely that such planning will need to take a top-down and bottom-up approach together with a means of reconciling the different outcomes produced by each. This would be a fruitful area for further research because it is clear that National Infrastructure Planning is the current state-of-the-art challenge facing governments around the world.

The current state of public policy toward infrastructure in most countries is that private sector participation in infrastructure should be one of a number of tools in a government's infrastructure toolkit. There are some clear advantages in engaging with the private sector, such as increasing the pool of available skills, access to finance and opportunities for transferring risk. However, it is also clear that the government must be well prepared to engage with the private sector if it is to ensure that the best outcomes for society will be obtained. Much of that preparedness comes from accepting that new



skills are required over and above those that are needed for traditional procurement so that there is a level playing field when the two sides meet at the negotiating table. All this depends on having an appropriate infrastructure framework in place and having the capability and political will to implement that framework rigorously. This framework is the subject of the next chapters.

#### **4.4 Summary**

Knowing the past is helpful to put in the present in context and providing guidance for the future. This is no less true for infrastructure, which has historically been provided by both public and private sector actors. World War II marked a significant change towards infrastructure public policy, with greater public involvement in Europe and a private but regulated orientation in America.

In the 1970s, a neoliberalist leaning saw deregulation and in the 1980s this was coupled with privatisation of infrastructure in Britain. In parallel there was significant growth of privately financed infrastructure in developing countries using project finance techniques, especially in East Asia and Latin America.

The inefficiencies of financing projects on a case-by-case basis was addressed by the British government in the mid-1990s in the form of the Private Finance Initiative (PFI) and this systematised policy, planning and procurement of infrastructure. Tools to help decide and document private sector relations were also developed and the PFI approach came to be known as public-private partnerships or PPP.

Mainstream international development institutions now support PPPs in infrastructure, partly because commercial financiers faltered during the Asian crisis in the late 1990s and it became clear that their involvement was needed. Since the new millennium, there has been a steady transition towards development of centralised government Infrastructure Management Units that are charged with developing and implementing National Infrastructure Plans. It is the formulation of those plans that remains to be reviewed.

## **Chapter 5: GOOD PRACTICE CONSIDERATIONS FOR INFRASTRUCTURE MANAGEMENT**

### **5.1 Introduction**

Start thinking of infrastructure not as something built but as networks of services to improve quality of life – H.Tokeshi

The previous chapters of this thesis have considered the inter-relationship between the state, infrastructure and development. From this it has been determined that the state has an important role to play regarding infrastructure. An examination has then been made of the history of infrastructure provision. This has helped us understand how the roles of different infrastructure actors have ebbed and flowed over time and what relevance this has today. In this context, an examination of the evolution of infrastructure provision during the last 30 years suggests that we have now arrived at a point where most governments see their role as being a planner, procurer, and regulator of infrastructure, but that they need not be the provider of all the inputs to a public service. In other words, governments provide a guiding hand towards ensuring certain infrastructure outcomes because it is now well established in this thesis that development outcomes are enhanced by good infrastructure service provision. However, the delivery of these outcomes can be left to whoever is in the best position to do so. In some cases, this will be the public sector under a traditional procurement model, and in other cases it is better to seek a commercial provider under a social-commercial model. These decisions cannot be made in isolation of other factors however, and the purpose of this chapter is to explore whether there is a good practice system that can be applied to infrastructure so that the best possible outcomes can be promoted. I will do this by drawing on my 24 years of experience as an infrastructure finance professional and published literature regarding infrastructure planning, implementation and monitoring. The system is intended to be a theoretical ideal and will be laid over the case study project in the next chapter.

#### **5.1.1 Visualising the Infrastructure Needed to Serve Society's Reasonable Expectations**

Society exists only as a mental concept; in the real world there are only individuals. – Oscar Wilde

### **5.1.2 Engaging with Society**

A first stage is to take a step back from the detail of current practices and look at infrastructure holistically. If governments are to take on a guiding role, then they must set the scene first by establishing a series of objectives regarding what purposes infrastructure will serve. This means starting with a vision for the type of society government (as representative of its people) wants to have. Ideally, that would be an individual choice, because countries do not necessarily want to emulate a particular model for development. Understanding what their society wants through whatever social or public choice is employed by that country is important, and from this, decisions can be made about how resources should be allocated.

According to Howell et al. (2000), the concepts of development and society did not interrelate until the late 1980s (Howell and Pearce 2002, p. 14) when development had reached Shurmanns (1996) impasse. Development activities had been built around a central state until then, but Eastern Europe led the way in breaking this down, and in doing so exposed a distinct civil society that highlighted the aspirations of people using their own voices (Howell and Pearce 2002, p. 14). This led to the idea of “social capital” in capitalist societies in the 1990s (Howell and Pearce 2002, p. 26), a term coined by Robert Putnam in a 1993 study of towns in Italy (Leonardi, 2003). Putnam referred to social capital as the “features of social organisation, such as trust, norms and networks that can improve the efficiency of society” (Leonardi, Nanetti et al. 1993, p. 167). More recently, Internet-based social networks have influenced social capital. Yang (2000) explored the relationship between civic engagement and Internet use to find that the Internet does have a positive effect on the level of political involvement that individuals have for example (Yang and Bergrud 2008, p. 248).

In development, this points towards greater engagement with civil society using the tools that are available. For infrastructure, this means government should fully understand societal needs as an ingredient to infrastructure planning, and given the importance of infrastructure as a core activity of the state, National Development Planning overall (Combat Poverty Agency, p. 3).

### **5.1.3 Encapsulating Society’s Expectations in the Plan**

National planning, therefore, is important to the decision-making process needed to understand the types of infrastructure that society needs. It is not necessarily a matter of

referring to an existing national plan and then deciding what infrastructure is needed for that plan to be realised. Instead, government needs to understand the role that infrastructure has regarding development, so that infrastructure becomes an input into the national planning process –one process supports the other. A National Development Plan goes hand in hand with a National Infrastructure Plan in the same way that a National Development Plan relies upon and informs sector roadmaps such as health, education, energy, transport, water, and sanitation.

In the previous chapter we learned that most infrastructure planning is done by local government, line ministries at a central government level and state owned enterprises. These plans may be coordinated by cross-sectoral ministries, such as planning and investment, finance, and the Prime Minister's office (or equivalent), but they are not necessarily aligned when it comes to questions of how resources are best allocated overall (Doug 2003, p. 65).

To confuse matters, state owned enterprises have a commercial mandate and the linkages with a government that wants to lead resource allocation to achieve social goals are tenuous because governments are also loathe to interfere with SOE governance (Aharoni 1981, p. 1341). For governments that embarked on a process of commercialising and privatising public services, many of the resources over which they once had oversight are no longer in their control. This is a real problem for policymakers, but they can still find ways to guide how SOEs allocate resources through legislation and regulation. What is arguably more difficult however, is dividing sectors that used to work together in concert into subsectors that no longer collaborate on planning to the same level as before (Kessides and World Bank. 2004, p. 48). An example of this is the unbundling of an electricity sector into generation, high voltage transmission, distribution, and retail subsystems. Before unbundling it was possible to make planning decisions based on what was most cost-effective for an entire system, but each subsystem operator in a disaggregated electricity system looks at their problems mainly from their perspective. Consequently, the national transmission company will aim to solve electricity problems with transmission solutions, a generator with generation solutions and so on. Those who advocate a market-based system would find this quite natural, but macro economists would also argue that it would be better for centralised planning to be restored so that the best system wide solutions can be identified. Having identified these solutions, the commercial sector can still be engaged

to deliver the outcomes. Therefore, the answer is not to turn the clock back towards re-bundling infrastructure subsectors, but instead to get the best out of the way things were done before and after commercialisation/privatisation.

While resource allocation is logically carried out with some centralised oversight, finding a way for that allocation to pass through to line ministries, local governments, and state owned enterprises is much more challenging. A National Infrastructure Plan, for example, can go some way to dealing with the need for these organisations to carry out a certain amount of planning within an overarching national framework (Godfried M 2010). Too often though, (and this was the case with the National Infrastructure Investment Plan development process in Tonga), infrastructure planning is seen as a process of sorting out which projects should be developed, rather than giving consideration to how infrastructure should be managed overall (D'Este, MacGeorge et al. 2010).

#### **5.1.4 Working with Competing Criteria and External Stakeholders**

Reconciling opposing planning viewpoints can be helped by developing a series of weightings to address the trade-offs that need to be made between competing high-level objectives, such as economic development, social development, environmental considerations, and what is politically expedient. If only one measure were to be used as the yardstick for planning then disastrous results could occur. By way of an example, if we were to consider only those infrastructure projects that would lead to the best economic outcomes, then most resources would be allocated towards highly urbanised areas because the ratio between economic outputs to economic inputs favours these settings, and therefore a policy leaning toward urbanisation. People who live on a remote island carrying out subsistence but nonetheless happy living, may have something to say about that, and this brings in both a social and political dimension. Unhappy people talk to the political representatives, who in turn lobby within government to achieve outcomes that are beneficial to their constituents, but not necessarily to the economy overall. There is therefore not a formula that can be applied to this process, nor is it possible to make a determination for one country that should apply to all. What is important however, is that governments honestly embark on the process of understanding the different drivers for infrastructure, identifying the optimal balance for each driver, identifying the tensions arising between these various drivers,

establishing a weighting system to help reconcile those tensions and, finally, arriving at a balanced view regarding infrastructure using this multi-criteria analysis approach.

Governments are not alone in driving the planning however. The *quid pro quo* for obtaining financial support from the international development community is acceptance of external advice and input (Kapur, Webb et al. 2000, p 1). Starting at the top, this includes aiming to achieve the MDG framework for halving poverty by 2015 which in turn, translates into the development of Poverty Reduction Strategy Papers (PRSPs) being agreed with the governments of beneficiary countries, despite the tensions between these two discussed in Section 3.1.2. It is intended that these PRSPs, once negotiated, form part of a National Development Plan. However, a major challenge for international development partners and beneficiary countries is to achieve alignment between MDGs, PRSPs and the existing budgeting and planning process used by each country (Tim Williamson & Vera Wilhelm 2008, p. 3). In that connection, there are four steps to establishing alignment, including:

- 1) Understanding where there are in-country gaps between policy, planning and budgeting.
- 2) Creating a strategic planning framework that links to a medium-term budgeting process.
- 3) Moving towards performance-based budgets.
- 4) Aligning the poverty reduction strategy agreed with international development partners alongside policy, planning and budgeting imperatives.

In other words, on the “in-country” side there needs to be an effort towards creating alignment between budget planning, implementation, and control. These three elements need to be further aligned with the external elements agreed with development partners that include PRSP policies and plans, a Medium-Term Economic Framework, and individual sector strategies. This of course, is no easy feat and requires minds to focus on having a robust internal decision-making framework, which is discussed next.

#### **5.1.5 Establishing a Decision Framework**

Assigning appropriate roles and responsibilities amongst institutions is an important part of establishing in-country alignment and minimising the overlap between various arms of government. One possibility is that a Ministry of Planning might take overall

responsibility for the poverty reduction strategy process, while the Ministry of Finance logically takes responsibility for the budget. The role for line ministries is in the development of individual sector strategies. It is in this area where the “left and right hands” of government can suffer from a lack of coordination, which can be addressed by establishing two phases to the budgeting process. The first of these is a strategic plan where the country’s resources are allocated at a high level (the “top down” approach) and secondly, establishing as a result of the strategic plan overall budgetary ceilings for individual sectors and their agencies (Tim Williamson & Vera Wilhelm 2008, p. 5).

Once a line ministry has a budgetary ceiling to work with, it is able to develop an operational plan and annual budget consistent with a “sector roadmap”. Sector roadmaps should be a sub-product of the National Development Plan and they should constantly evolve by being updated every one to three years. It is of course possible, that the sector roadmap calls for expenditure that is far greater than has been permitted by the top down imposed budget ceilings. In this case, there needs to be some iteration between the line ministry, Ministry of Planning, and the Ministry of Finance to reconcile the differences.

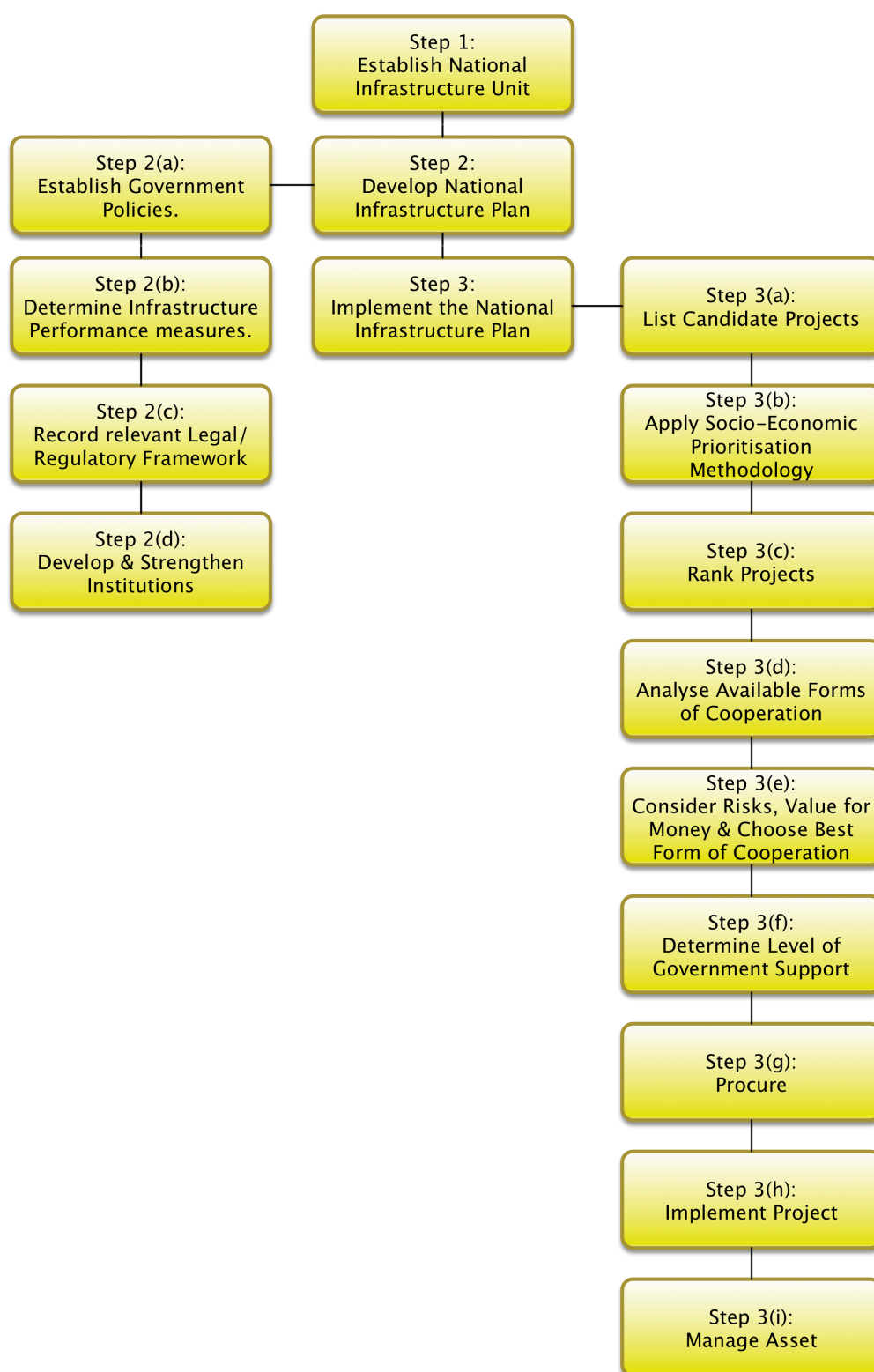
Reconciling differences can be achieved through a prioritisation process that finds a way for cost estimates to be matched with policy directions and available resources. As most sectors have a major infrastructure component to them, it makes sense that this prioritisation process (together with top-down policy and individual project cost estimates) are dealt with through a National Infrastructure Plan (NIP) that is informed by each of the sector roadmaps. While each line ministry might establish its own priorities, these need to be re-examined at the National Infrastructure Planning level because overall national resources are at stake.

Figure 9 below depicts a National Infrastructure Plan being nestled as something between a subset to a National Development Plan and an aggregation of sector roadmaps. The plan will not write itself however and should be developed by either the planning ministry or the finance ministry, but the implementation of the plan would require enough resources to underpin the establishment of a separate Infrastructure Management Unit, the importance of which is dealt with in Section 4.3.5.





**Figure 9 – Steps toward an Infrastructure Management System**



Source: Author

### **5.1.8 Establishing a National Infrastructure Unit (Step 1)**

The first task for a National Infrastructure Unit is the development of a National Infrastructure Plan, which would inform and be informed by different arms of government and civil society. This is the approach that has been taken in Australia, Canada, New Zealand, and the United Kingdom. In each of these cases, specific legislation was passed to enable creation of each unit.

As discussed in Section 4.3.5, , Infrastructure Management Units can be within the planning or finance ministries, and can also be established as independent organisations. What is most crucial is that the new organisation has authority to act, and this comes from having the right legislative backing, appropriate commitment from senior government personnel, appointing senior management to the units that are highly regarded, and buy-in from line ministries and other arms of government within which the management unit will interface. Buy-in is helped by the unit being staffed with people who have appropriate skills across a range of disciplines. These include legal, technical, financial, economic, environmental, and social disciplines.

In addition to having strong management, an Infrastructure Management Unit needs to have a governing body that is able to straddle the sometimes conflicting needs of government, and can deal with a potentially powerful private sector as a lobby group. The appointment of an elder statesperson who is highly regarded nationally is usually appropriate. The chairperson should be supplemented at a governance level, with highly regarded people in the public and private sectors who have skills that match the Infrastructure Management Unit's organisational structure.

### **5.1.9 Developing a National Infrastructure Plan (Step 2)**

The principal focus of the Infrastructure Management Unit should be a National Infrastructure Plan, which should ideally have a number of features that cause it to be the principal manual that articulates a country's infrastructure management system and guides how that country will develop, maintain, and operate infrastructure as inputs to predetermined societal outcomes. Consequently, the plan should set out how a country's infrastructure management system is to work and in doing so, it should address each of the following elements.

**5.1.9.1 Establishes the government's policies regarding infrastructure through the National Infrastructure Plan (Step 2a).**

The National Infrastructure Plan is the appropriate document to articulate the material elements of a nation's infrastructure management system. Reference should ideally be made to a National Development Plan from which specific infrastructure development objectives are drawn. These objectives may include revenue maximisation, minimising costs of service, increasing the quality of services, expanding access to services (especially in an isolated geographic areas), improving welfare, protecting the environment, developing opportunities for local industry to provide services and raw materials, improving the local capital market, reforming the public sector, regional development, and transferring risk away from government (World Bank 2001, p. 16).

**5.1.9.2 Determines a means by which infrastructure performance across the whole country can be measured as objectively as possible (Step 2b).**

Measuring performance in some holistic sense is not easy, because a tool that can accurately measure qualitative and quantitative factors must first be identified. One means, as discussed in Section 3.2.2, is benefit-cost analysis, but this has been seen to have a series of pitfalls which make it a questionable choice as an analytical tool by itself. Another option is multi-criteria analysis, which is a process that accepts that decision-making necessary involves a degree of subjectivity, so a yardstick is needed to measure both subjective and objective considerations. GDP growth can be selected as a measure, but this would be unreliable given the many other factors that contribute to GDP growth. The same argument can be applied to other types of overall welfare indices save, perhaps, for a robust National Happiness Index. Whatever tool is chosen, it must be applied consistently across a nation's entire infrastructure if the results are to have any hope of being a reasonable basis for measuring whole country infrastructure performance.

**5.1.9.3 Recording the legal and regulatory framework regarding infrastructure (Step 2c)**

Aside from listing and describing laws, regulations, and rules, a statement regarding how the legal and regulatory framework will be developed over time so that the infrastructure development objectives can be achieved should also form part of the National Infrastructure Plan. This is because a major problem in developing countries is that legislation is often less well developed than higher income countries. Sometimes this legislation is translated for the benefit of international investors into English, and

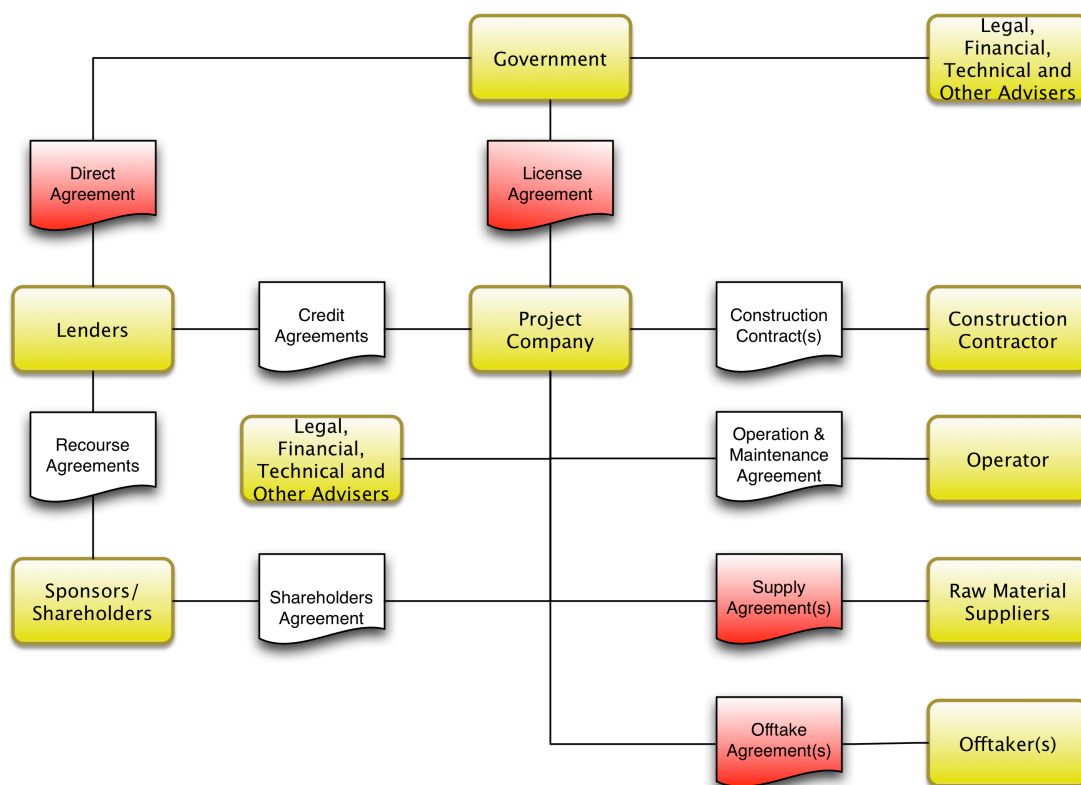
some of the meaning intended by the original documents is lost. To compound the problem further, there is a tendency for laws relating to security over real and intangible property to be less clear than financiers of major capital projects would prefer. Project developers have two choices in this situation, which are to try to influence legislative change, or to deal with legislative shortcomings in project documentation. As it is usually too difficult to change legislation (unless the project concerned is very large), developers consequently aim to improve project documentation, especially between the project company and the government.

Figure 10 below illustrates the major agreements and structure of a typical commercially financed project. We can see that there are a number of potential direct interfaces with government (shown in red shading) which include:

- a. The license agreement between the government and the company that will develop the project;
- b. A direct agreement between the government and the lenders to the project company (because they want to have certain assurances made directly to them rather than second hand through the project company itself);
- c. Raw materials supply and product sales agreements. In countries that have significant state ownership of resources and utilities, it is not uncommon for a private developer to build a project that will process raw materials supplied by a state-owned enterprise, and then sell the finished product to another state-owned enterprise.

In addition to contractual arrangements between a project company and government, a project is also subject to a myriad of laws that govern the project. It is in the agreements between government and the project company where the developer seeks to give clarity to (or contract out of) those laws.

**Figure 10 – Typical Structure of a Commercially Financed Infrastructure Project**



Source: Author

Kessides (1993), Harris (2003), and Guasch (2004) all consider a further challenge of this regulatory risk in developing countries as a major concern to infrastructure financiers. The result of this is two-fold. Firstly, financiers prefer bilateral agreements to reliance on regulation and, as each project has agreements that are negotiated on a case-by-case basis, there is no one standard. Secondly, as developing countries evolve their infrastructure policies, it is not unusual for a regulator to be established. The new regulator's role is made very difficult because it must try to assert a common standard amid a range of projects that have individual agreements. The new regulator's preference would be to unwind those agreements so that it can perform its functions without having its hands tied, but this risks the financing for those projects collapsing. Project financiers who have entered into arrangements on one understanding are not inclined to accept the imposition of a newly established regulator, particularly in developing countries where there are questions about the degree to which the regulator is truly independent of government.

The National Infrastructure Plan therefore affords an opportunity for government to set out its intentions regarding the principal laws affecting infrastructure. This often leads to the development of standardised project agreements that limit the scope for negotiation, and by strengthening legislation so that project agreements do not have to fill legislative gaps and uncertainties.

#### **5.1.9.4 Developing and strengthening institutions (Step 2d)**

The prospects for making institutional improvements lies in having clear roles and responsibilities, minimising overlap between institutions, providing clarity to processes so that coordination between institutions is promoted and ensuring people having the appropriate capacity to carry out their functions.

One way that institutions can be strengthened is through the adoption of common operating procedures (Jones 2007, p. 255) to support the standardised documentation discussed in the preceding section. Aside from the documentation efficiency, a further benefit of standardisation is that the government, by doing so, makes a clear statement that it is in control of the decision-making process. Very often in developing countries there is a shortage of legal and commercial experience amongst bureaucrats, which is made even more difficult when English (the language of most international agreements) is a second or third language. A common response to that situation is to allow developers to draft their own documents for presentation to their governmental counterparts. This has a couple of major drawbacks, including a forced departure from an orderly procedure and inconsistency of documentation across projects, leading to more governmental resources being required to understand the nature of transactions being entered. Moreover, developer led documentation transfers undue control to the developer and developers will naturally present developer friendly agreements that must be negotiated towards the government's preferred position rather than in the other direction. The effect of this is that government's ability to play a strong regulatory role is undermined and local ownership and control over projects can be lost.

Perhaps the enduring feature of standardisation is that there is less room for disagreement about the intent of well-structured agreements that have been carefully thought through as part of an overarching infrastructure management process rather than being crafted in the heat of battle for an individual project. In this regard, it becomes even more difficult for a developer to challenge agreements that import

features from international legal agreements and treaties. An example is the UNCITRAL Model Provisions for Privately Financed Infrastructure Projects (United Nations Commission on International Trade Law 2004), the UNCITRAL Model Law on Procurement of Goods, Works and Services (United Nations Commission on International Trade Law 1999) and provisions of World Trade Organisation agreements such as *force majeure*. Each of those naturally needs to be considered in light of prevailing legislation in the country strengthening its laws and institutions, but international investors are likely to be encouraged by best practice language even if they grumble about the limited scope allowed them to vary contracts.

Good processes and documents are only as good as the people who apply them. This means that building institutional and human capacity to work with the new tools is needed too. External help, possibly with development bank technical assistance funding, can help finance and source consultants for these initiatives. Obtaining finance and skilled people to help improve organisational and human performance is a small impediment compared to other human factors that get in the way of making positive changes. Prime amongst these are the distorting effect of corruption, which is especially important in the context of infrastructure because of its capital intensity and capacity to “lose up to 20% of construction costs to corruption” (Kenny, Economics et al. 2006, p. 4). Patronage and transparency do not cohabit well, so it is not surprising when a senior official does not support reforms that would lead to clear, standardised approaches that are able to bear scrutiny. This is less likely when patronage is endemic and that official has had to buy their position within government. It is, of course, difficult to see evidence of corruption first-hand, but it is possible to see decisions that are apparently illogical being made that lead to distortions and misallocation of scarce resources in countries that can ill afford to make poor decisions. Consequently, rooting out corruption and obtaining commitment from senior level bureaucrats is a pre-requisite to good institutional reform (Kenny 2007, p. 24).

Even with honest government, the road to institutional and human capacity strengthening is fraught with challenges. These include entrenched bureaucracy that has developed inertia and an inability toward change. An example of this is in the information silos and lack of delegated authority that mark some governments and institutions. It is a problem when the person at the top does not communicate well with staff or give them some autonomy to make decisions. Organisations with these features

become dysfunctional and good-quality junior and middle management staff becomes disenchanted. To them, personal capacity building and training helps their chances of finding a better-paid job in the private sector, which is a loss for the government and possibly the country too (James 1998).

Exacerbating the flight to the private sector are public sector pay scales, which generally are lower than the private sector. This is a problem because staff are more inclined to work to rule on their public service employment than find ways to improve personal and organisational performance, so salary scales are a major impediment to institutional strengthening. In part this can be addressed by introducing performance-based pay but this means government wide change, which is especially challenging. One way to address this is for the government to create special entities, like an Infrastructure Management Unit, that has more commercial employment conditions. Aside from attracting and keeping talent, it would be possible to fund extra wage costs through engagements with the private sector. For example, bidders for infrastructure contracts might be required to pay a price for the tender documents that help finance the special unit.

A further means of strengthening human capacity is to limit the number of workshops to avoid “workshop fatigue” (United Nations Human Settlements Programme and EcoPlan International Inc 2005, p. 69), and the amount of international travel that is financed by international public and private organisations. This would mean that staff would have more time on the job, although it is fair to say that not all of the many excursions staff take are wasteful. However, greater governance of out of work events will increase productive time and reduce the opportunities for commercial organisations to curry favour with government officials.

It can be seen that many institutional shortcomings lie in work cultural practices. Developing countries are not alone in facing many of these issues however. The problem is that in solving these difficulties for infrastructure, they are also solved right across government.

## **5.2 Implementing the National Infrastructure Plan (Step 3)**

Planning is bringing the future into the present so that you can do something about it now – Alan Lakein

While the performance measures, legal, institutional and human aspects affecting National Infrastructure Planning have been reviewed, we do not as yet know how to



process infrastructure initiatives specifically. These are the elements shown in the right-hand column of Figure 9 earlier, being the nine subsets that should be the day-to-day focus of an Infrastructure Management Unit.

### **5.2.1 Listing projects that are consistent with the NDP and Infrastructure Development Objectives (Step 3a)**

A project need not be a new construction project, but could be any initiative that helps deliver better infrastructure results. This could include: policy enhancements; improvements to institutions, laws, regulations, processes and human capacity; and better asset management of existing infrastructure and demand side management. All but asset management and Demand Side Management (DSM) have been discussed in previous sections, so it is appropriate to dwell on these latter two issues at this juncture

Research shows that allocating funds towards maintaining existing infrastructure assets can have positive effects on a country's GDP (Rioja 2003, p. 2282). Unfortunately, maintenance is often not given the priority it deserves because infrastructure managers prefer new projects. In part this is because new projects are more visible than maintenance projects but it is also because it can be easier to build something new than fix something that exists. Moreover, development banks and bilateral agencies have also fallen into the trap of focusing unduly on new projects because they are geared around providing or facilitating the provision of capital rather than funding operations.

There is much to be said for incorporating good asset management practices into an infrastructure management system. There is a strong inter-relationship between regulation and asset management. For example, service prices often do not include adequate provision for maintenance. This problem is made worse where there are operational inefficiencies that further reduce the cash flow available to fund maintenance activities. Furthermore, often investment decisions are made on the simple basis of considering supply costs rather than the whole of life-cycle cost of an infrastructure asset and this can lead to cheaper equipment being purchased only to find that it has very expensive servicing costs or needs to be replaced early. There seems also to be a culture that is consistent amongst many developing countries of carrying out breakdown maintenance rather than focusing on preventive maintenance, which is cheaper and reduces outages and lost revenues. Consequently, maintenance related projects are worthy initiatives to be listed as candidate projects.

In addition to asset management, demand side management can reduce the need for infrastructure investment without affecting quality of life or economic output unduly. Demand Side Management involves interventions that can be made to reduce consumption for infrastructure services, thereby delaying or avoiding the need for new investment. Often used in an energy context, DSM measures include educational efforts, time of use billing, substitution for alternative technologies and so forth. Like maintenance, planners should see DSM initiatives as being legitimate projects.

Resisting the temptation to embark on a whole range of new, capital intensive, projects and instead focus on improving the efficiency of existing operations and management of currently held infrastructure stock is the role of management and the governance bodies. Corporatising infrastructure businesses is a helpful starting point because the business can be accounted for as a discrete unit and, accordingly, its performance can be measured better than if its assets are bundled amongst other assets and businesses. Performance criteria need not be solely financial measures but can also incorporate people, planet and profit triple bottom line features (Elkington 2004, p. 2). If it is necessary for the corporatised body to carry out functions that are not financially viable, those viability “gaps” can be closed by a public service obligation payment from the State. Corporatising an infrastructure business has the added advantage of being able to overlay a governance structure, which is absent for non-corporatised public infrastructure businesses.

Overall, it is not necessary to raise large amounts of capital to improve infrastructure outcomes. Acceptable projects should be any initiative that improves infrastructure outcomes rather than simply being focused on greenfield projects.

### **5.2.2 Applying a prioritisation methodology to ensure the right projects are chosen (Step 3b)**

Decisions need to be made about which projects best serve the country’s interests. This process also helps decide on the sequencing of projects so that the country’s limited resources are applied efficiently. This should be measured using tools such as multi-criteria analysis that has social dimensions (Spangenberg and Settele 2010, p. 334), benefit-cost analysis and least cost expansion planning (in the case of network infrastructure). Each of these approaches have been discussed in preceding chapters and are not considered again here.

### **5.2.3 Ranking projects to arrange the order in which development is to take place (Step 3c)**

It is theoretically tempting to create a single national list of projects from a variety of sectors that are ordered by their merit from a national viewpoint. If a single tool for measuring national benefits were to be used then this might be possible. This is unlikely though because systems planning for network infrastructure like electricity systems, water and waste systems is complex and projects can not always be evaluated individually due to the inter-dependencies between one project and another. The best that is likely to be achieved is that project lists by sector are determined as part of each sector roadmap. This was broadly the approach that was taken for the development of the Tonga National Infrastructure Investment Plan and other similar plans (Government of Tonga 2010).

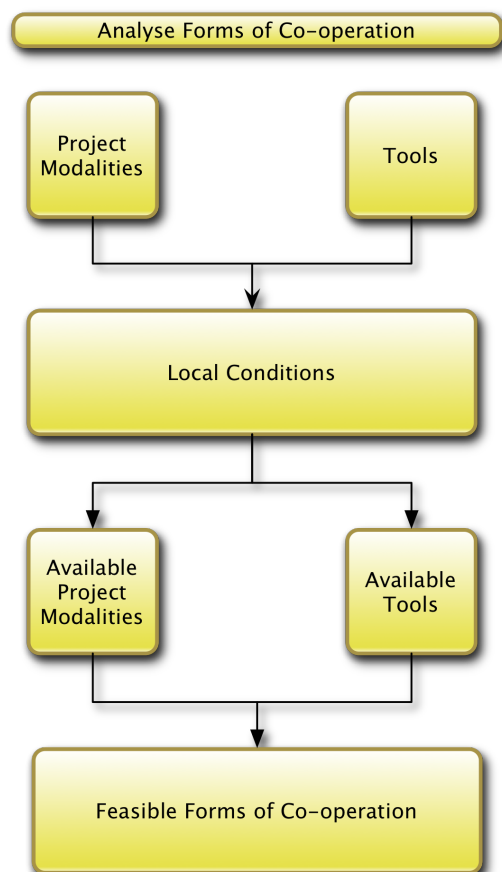
It is entirely possible that when a prioritised list of infrastructure projects is disclosed, there will be much dissent from infrastructure stakeholders unless the process for determining that prioritisation is agreed at the outset. In Tonga, it was decided that it would be better to have a discussion with stakeholders about the prioritisation process so that consensus could be built before the process was actually applied to individual projects. It is much more difficult to criticise the outcome when one has been involved in developing the machinery through participative design (Gharajedaghi and Ackoff 1986, p. 57) for arriving at that outcome.

Projects that are not scheduled to start within the term of the National Infrastructure Plan do not need to be considered, so these projects can be excluded from further evaluation (Government of Tonga 2010). The next prioritisation process should focus on whether each project aligns with the National Development Plan. The National Infrastructure Unit through consultation with infrastructure stakeholders should establish the criteria that might be considered after that “strategic alignment test” (Government of Tonga 2010), but they could include factors such as economic, social, environmental and readiness criteria. Tools that attempt to monetise these criteria, such as benefit cost analysis, are worth considering as part of the analytical mix if adequate skills are available to make these assessments. Projects should ideally generate net economic benefits to provide comfort that the country’s limited resources are being used efficiently and, to the extent they are not, that the trade-offs being made are understood.

While financial viability might be one criterion used to rank projects, it should not ordinarily be a factor at this stage of the assessment process as explained below. What is more important is that the project is economically, socially and environmentally sound.

#### 5.2.4 Analyse the range of forms of cooperation applicable to projects (Step 3d)

**Figure 11 – Analytical Framework for Determining Forms of Cooperation**



If a candidate project is socio-economically appealing, then it should be implemented in accordance with its ranking. Ideally the project should also be financially viable, but this is not a consideration from a national investment viewpoint. It does, however, have bearing on the number of projects that can be developed because public finances are finite and therefore the extent to which the private sector can be leveraged will determine how many “extra” projects can be implemented.

The range of ways that a project could be implemented need to be considered and these are referred to as “forms of cooperation” or project modalities (Vives, Paris et al. 2006, p. 5). Chapter 4.2.4 (c) examined these in the context of a “PPP menu” and Chapter 4.3.4 (c) went on to discuss an approach developed by the Inter-American Development Bank

for the water sector as a replacement for the typical decision-making process used by developed countries when deciding whether to have the public or private sectors develop a particular project. It is timely therefore to return to the IADB work to describe the next step in our holistic infrastructure management system.

The IADB suggests the analytical framework shown in Figure 11. Key terms from the framework are:

**Modalities:** the different forms of ownership (like management contracts or build-operate-transfer concessions) that make up the spectrum of public to private

participation alternatives that could be applied to finance a given project. That spectrum is shown in Figure 6 (Vives, Paris et al. 2006).

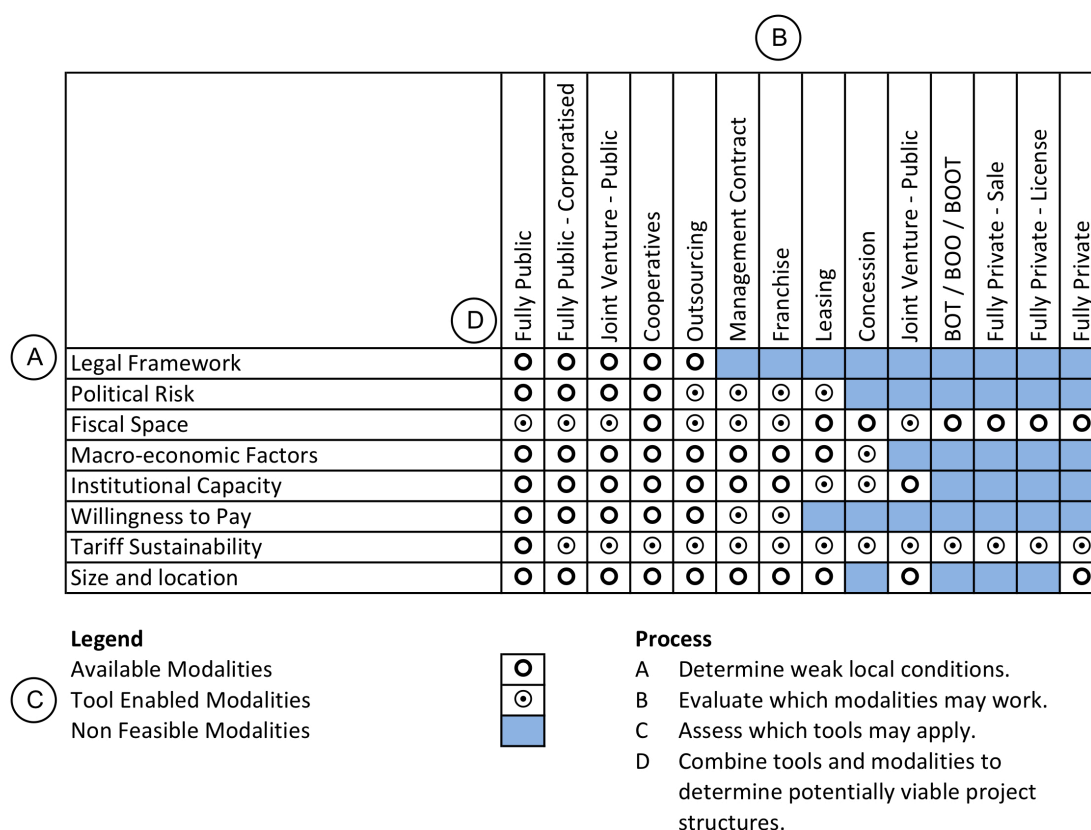
**Tools:** the instruments that could be used to mitigate specific risks so as to widen the range of available project modalities. Particular examples include government support, risk mitigation instruments (like partial risk guarantees) and tools that might reduce the risk of justice being denied, such as agreement between project parties to resolve disputes via international arbitration (Vives, Paris et al. 2006).

**Local conditions or variables:** those parts of a country's business climate that affect how attractive a project is likely to be to private investors. Examples include the legal framework, institutional arrangements, political risks and macro-economic conditions (Vives, Paris et al. 2006).

**Feasible Forms of Cooperation:** the specific combination of Modalities and Tools that could be used to develop a particular project (Vives, Paris et al. 2006).

Having established the terminology used in the forms of cooperation framework, the application of the framework involves a four-step process that: (i) assesses local conditions; (ii) evaluates possible project modalities under these local conditions; (iii) identifies risk mitigation instruments that could be used to expand the number of forms of cooperation that could be used for a project and, finally; (iv) identifies the feasible forms of cooperation for the project concerned. Figure 12 below provides an illustration of the product of this process as an example. It shows an example project that has been evaluated for local factors that can limit the range of workable forms of ownership, resulting in a residual set of workable options (represented as the dark circles).

**Figure 12 – Project Feasibility Map Example**



Source: An Application to Water Projects, Inter-American Development Bank, September 2006

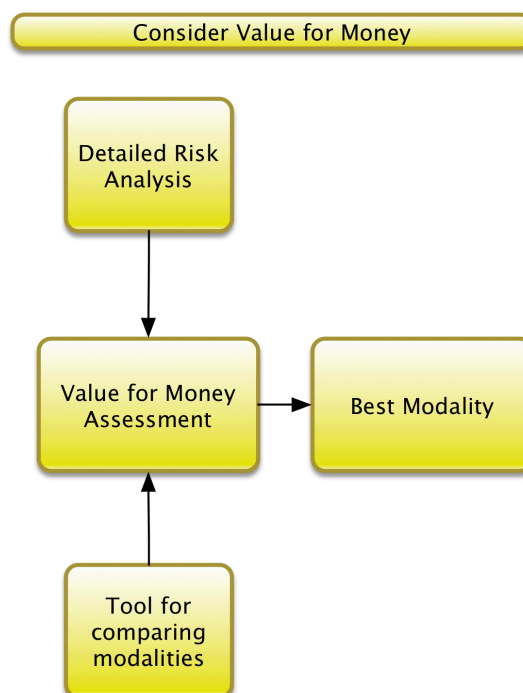
Once the feasible forms of cooperation as a subset of available forms of cooperation have been decided, the next step is to see which of these is the best form to use. At this point some financial modelling of a candidate project for each available form of cooperation is needed, but this involves much less quantitative analysis than if all the options were to be considered. A benefit of reduced modelling is a lessening of the burden placed on scarce human resources.

### 5.2.5 Consider risks and Value for Money to decide upon the best form of cooperation (Step 3e)

Having a series of guidelines for deciding which projects will be developed by the public sector and which should be candidates for development by the private sector is an important part of an infrastructure management system. As discussed in Section 4.3.4(a), many industrialised or higher income countries have settled on a Value for Money concept from making judgements about whether project should be developed by the public or private sectors (PriceWaterhouseCoopers 2005). Section 4.3.4(d) questions that approach in the context of developing countries, primarily because

developing countries often do not have a public sector financing option because of budgetary constraints (Leigland and Shugart 2006).

**Figure 13 – The Process for Determining the Best Form of Cooperation**



It is at this point that a Value for Money type of assessment can only be used if it has a different purpose to simply aiming to decide whether the public or private sectors will develop a candidate project. Instead the objective in a developing country that is trying to make its financial resources go as far as possible is to see which form of cooperation offers the highest Project NPV, which is the net present value of a project's net cash flows, and is therefore the best financial modality to employ. Figure 13 illustrates the process being described.

The form of cooperation that has the highest Project NPV is more likely to pass a “Financeability Test”, which comes shortly when we raise the question of government support. The closer a project is to passing the Financeability Test, the lower the support that will be required of government, which represents better Value for Money. This test is therefore quite different to a Public Sector Comparator test discussed in Section 4.3.4 (b).

As calculating a Project NPV is necessarily quantitative in nature, this is why a financial model tool should be used to as a tool for comparing modalities. When doing so, the risks associated with the project also need to be considered and incorporated into

the financial modelling in some way (HM Treasury 1999). Financial models are traditionally “deterministic”, which is where inputs are fixed and there is only one output for each set of inputs. The main deterministic analysis techniques are ‘What-if?’ scenarios and Sensitivity Analysis. These approaches have some disadvantages because an equal probability of occurrence is given to all scenarios, possible inter-dependencies between the variables are ignored and large projects have too many permutations to consider realistically. An alternative is to use a probabilistic (or stochastic model), which accepts that variables are uncertain. These are described by probability distributions rather than by unique values and result in a range of outcomes that are usually derived by using a Monte Carlo simulation (see Waskita et al. 2010). These outcomes average out to give an “expected” outcome that inherently takes project risks into account.

When calculating Project NPVs, adjustments need to be made so that realistic results can be achieved. The net cash flows should be “optimised” and secondly they should be “revenue constrained”. This is explained below:

**Optimising:** refers to the scenario that uses the best set of assumptions that are reasonably achievable for a candidate project, which in many respects is the opposite of what project suppliers like construction contractors are seeking (Halpin and Senior 2009). The process of optimising means that the government must put itself in the position of a prudent developer so that realistic assumptions can be determined. External advisors and market sounding can help achieve this objective.

**Revenue constraining:** means placing a constraint on revenue. This constraint is important because there are limits to the amount that end users are willing and able to pay for a candidate project’s services. Revenue assumptions need to be determined by the demand analysis that should form part of a project’s feasibility study and by reference to achievable service prices. For projects that would wholesale their services to an offtaker such as a municipal water treatment project or a power station, the tariff ought to be set by reference to an “avoided cost” calculation, which is the cost the buyer would otherwise have had to incur. For projects that would retail directly to end users, such as toll roads, then the tariff should be set by measuring consumers’ willingness to pay for the service (Vives, Paris et al. 2006).



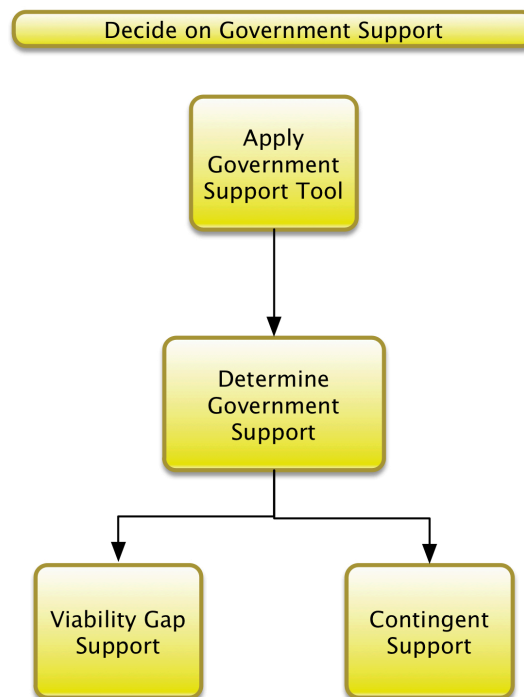
Up to this point we have considered whether a candidate project has socio-economic net benefits, the order in which that project should be ranked for development and which is the best form of cooperation to use for the development of the project. What has not yet been decided is whether the project is financially feasible or not, which is considered next.

#### **5.2.6 Determining the degree to which government support is provided (Step 3f)**

If a public sector modality has been selected for developing a project, then financial feasibility is not important. However, if a commercial modality is the best form of cooperation then financial feasibility is all-important (ADB, 1997). Therefore, the next step in the assessment process is to determine the financial feasibility of a candidate project and, for those projects that are not financially feasible, to calculate the minimum amount of government support that is required for the project to be financially feasible and therefore attractive to private sector developers (Sharan, Lohani et al. 2007).

Decisions about support can be made using a systematic approach that is illustrated in Figure 14 below. A tool is needed to determine what, if any support is needed and then decisions need to be made about whether that support is made in the form of direct financial support by way of loans, grants or operating subsidies, or whether it is made via contingent support in the form of guarantees (Dailami, Klein et al. 1998).

**Figure 14– Deciding on Government Financial Support**



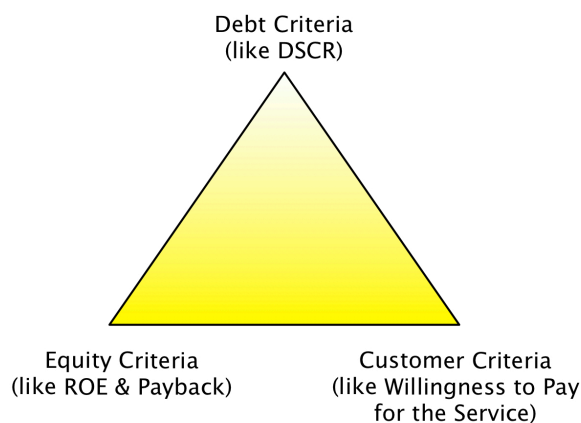
Devising a government support tool for projects to be privately financed centres on measuring their financeability. This depends very much on the capacity and appetite of equity investors and providers of debt capital (lenders). The main difference between these two types of finance providers is the relationship between return and risk. This is because equity investors anticipate taking higher risks and receiving commensurately higher returns. Lenders, on the other hand, take less risk and in return receive a lower return for their money. The flip side, of course, is that they enjoy better security than equity investors should the project fail for some reason.

Lenders spend a great deal of time understanding the risks associated with a project and are often considered as being the “weakest link in the chain” when it comes to finance. This is why there is a focus on the question of “bankability”, which is a measure of the likelihood that a project will be able to attract bank finance on terms that will leave equity investors with a reasonable rate of return and end users with a reasonably priced service (Sader 2000). This triangular relationship needs to be considered when making a judgement about whether a project is financially feasible and suitable for private sector development.

Figure 15 shows this triangular relationship more clearly. Lenders are concerned about considerations such as whether the cash flow generated from the project will be sufficient to meet debt service obligations and these are measured by debt criteria such

as “debt service cover factors” (Ryan 2011), whereas equity providers are concerned about the rate of return from their investment and when they are likely to be repaid (payback). Customers want to make sure that the service is priced as cheaply as possible (without compromising quality) and this can be measured by considering willingness to pay criteria, primarily by looking at the prices of substitute services.

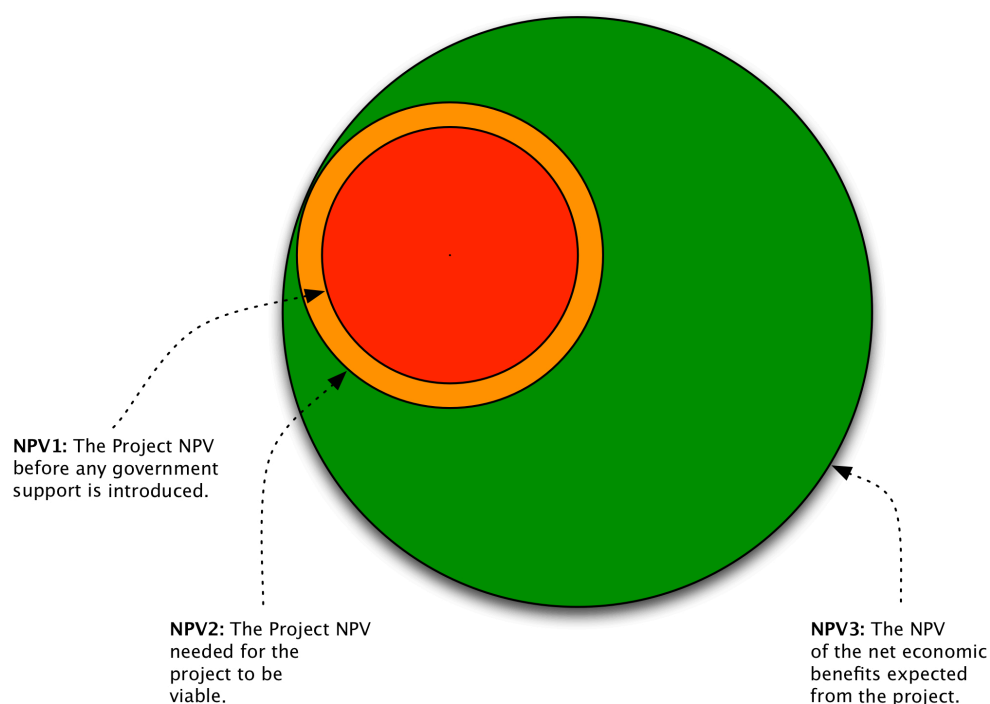
**Figure 15 – Balance of Financial Relationships in a Project**



Source: Author

Each of these factors help make up a financial viability assessment to make judgements about whether the project can be financed commercially. Even if the project cannot be financed commercially, sometimes it is in the best interests of government to find ways to make a project financially viable so that the economic benefits that stem from the project are not lost. Naturally government wants to minimise its financial support for a project and the support should be no more than what is termed as a “viability gap” (Sharan, Lohani et al. 2007). The term viability gap has been mentioned several times in this thesis and it now requires some further definition. It is the difference between the present value of the project at its minimum level of viability (shown as “NPV 2” in Figure 16) and the present value of the project before any government financial support is introduced (shown as “NPV 1” in Figure 16).

**Figure 16 – Illustration of Project Economic and Financial Benefits and a “Viability Gap”**



Source: Author

Figure 16, above, illustrates this viability gap hypothetically. The area shown in green represents the net economic benefits that are expected to be derived from this hypothetical project. The area shown in red depicts the project NPV and in this case let us assume that the project is not viable because it does not pass the financeability test for lender, investor and customer criteria. The minimum net present value required for that financeability test to be passed is shown in by the orange area. The gap between the orange and red areas is the “viability gap”. Government introducing financial support equal to the net present value of that viability gap can close this. That financial support is effectively a cross subsidy that sees a transfer of some of the net economic benefits (shown as the green area and “NPV 3” in Figure 16) to the private sector developer. This ensures that the project is developed so that the net economic benefit (less the value of the subsidy) can be obtained by society (Hodge, Greve et al. 2011).

If a candidate project has proceeded to this point, all that remains is for the service to be procured. Procurement is a vitally important (Toan and OZAWA) part of the infrastructure management system and this is examined next.

### **5.2.7 Procuring providers of services (Step 3g)**

Procurement is one of the last stages of the application of an Infrastructure Management System, preceding only implementing and supervision of individual projects. For procurement to be successful, government must adopt an approach that is consistent with international good practice so that potential developers can be assured that a robust process is in place (United Nations Industrial Development Organization. 1996). In turn, this depends on having guidelines that are conscious not only of international standards but are also integrated into local legislation and the institutional setting.

Section of 5.3.3 (c) refers to the UNCITRAL Model Law on Procurement of Goods, Works and Services (United Nations Commission on International Trade Law 2004), but many other agencies have also developed procurement norms. Some of these include:

- a. The ADB Procurement Guidelines (Asian Development Bank 2006);
- b. OECD Strengthening Procurement Capacities in Developing Countries (OECD);
- c. Procurement Guidelines under IBRD Loans and IDA Credits (World Bank 2004); and
- d. Other procurement systems (Rowlinson, McDermott et al. 1999).

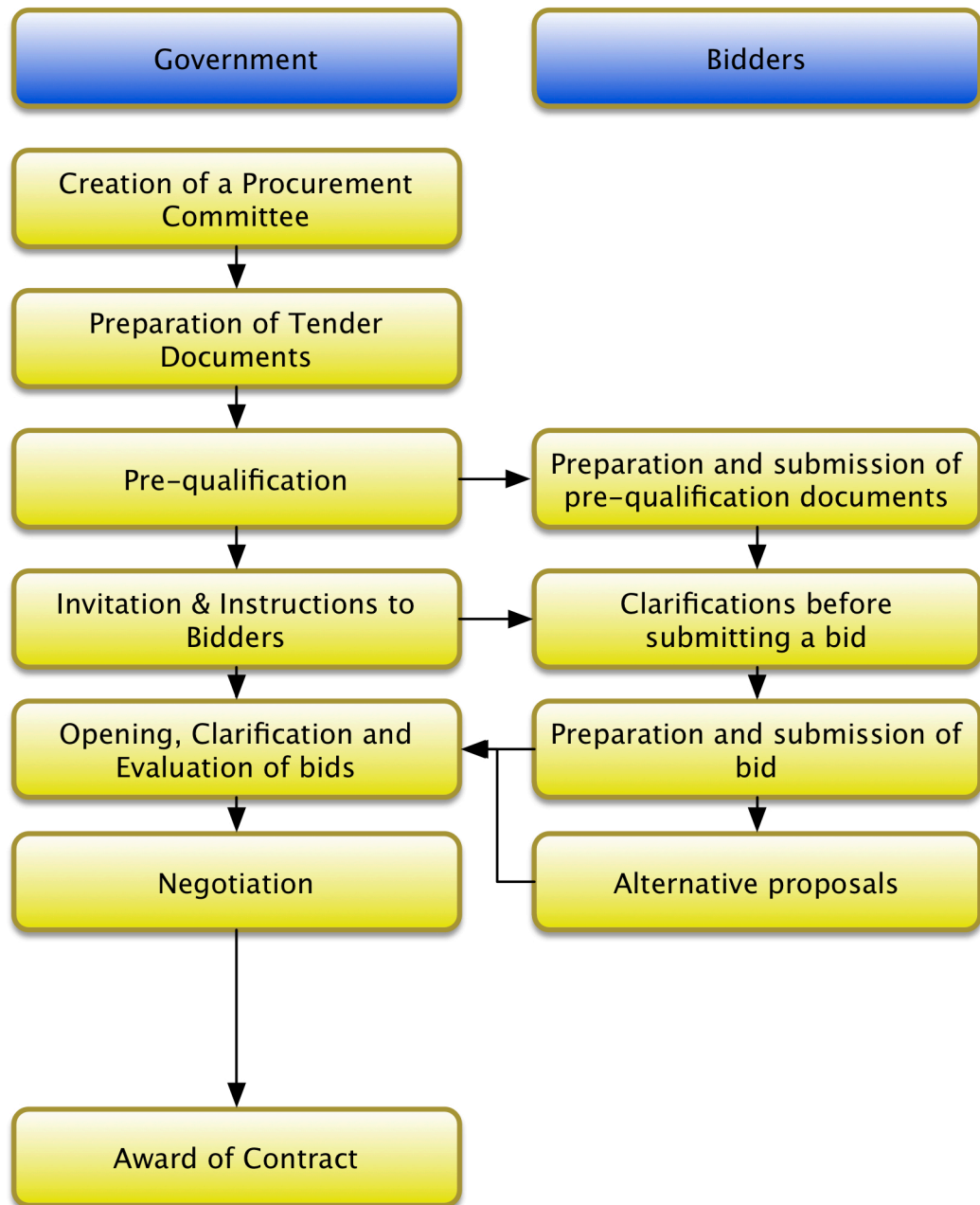
There is, therefore, no single approach to procurement although many of these guidelines have consistent themes. What is important is that a government incorporates the themes of international best practice into its own legislation. Due regard should be given to the procurement requirements of the development partners for that country because it is wasteful to proceed with a procurement only to find development partner funding is not available because their rules have not been followed (United Nations Industrial Development Organization. 1996).

The OECD Strengthening Procurement Capacities in Developing Countries cites six factors as being the starting point for procurement reform in developing countries and these centre on increasing competition, transparency, efficiency; the professionalism of procurement operations and respect for procurement agencies. Special mention is also made on the reduction of corruption to help improve procurement outcomes because it is in procurement that corruption is most often manifested (OECD).

In addition to these observations there are a number of themes that shine through regarding good procurement practices. These include having clear procedures that are fair and transparent, with complaints being dealt with openly and reasonably. Other good practice indicators include finding ways to encourage innovation from the private sector, minimising the time and expense of project development, having due regard for non-price factors, rather than price alone, and having clear policies regarding the management of unsolicited proposals.

Figure 17 illustrates a typical process for procuring an infrastructure developer or contractor. There are essentially two streams of activities, on the side of the government and one on the side of the bidders for the project. The process starts with government and is largely the same irrespective of whether a traditional procurement for a construction contractor or concession procurement for a developer (who will take charge of the whole life of an infrastructure asset) is being considered.

**Figure 17 – Typical Infrastructure Procurement Process**



Source: Adapted from (United Nations Industrial Development Organization. 1996, p. 103).

There are many nuances involved in procurement that cannot be fully explored in this thesis. Suffice to say that good procurement will lead to effective implementation, which in turn will lead to more satisfactory monitoring and management of infrastructure assets once completed. It is with this in mind that attention turns to the two final elements of a holistic infrastructure management system, which are project implementation and the monitoring of contracts once they have been let.

### **5.2.8 Implementing the project and ensuring assets are managed in accordance with expectations (Step 3h)**

Once a contractor has been procured, the burden of the work falls on to them irrespective of whether the project is a traditional development or is a concession type of contract. Government will have a number of obligations, such as the provision of any government support, access to the project site and delivery of consents and licenses so that the project may proceed. Other than these matters, the role for government at this point is primarily one of supervision (Yong 2010) and here there are a number of principles that are important, namely:

- a. The contract made between the government and the contractor should provide for a series of milestones to be achieved, the failure of which can lead to termination of the contract (Gorgens and Kusek 2010).
- b. The contract with the private sector should also provide for an obligation for the developer to maintain records and provide periodic reports to government.
- c. Government and its representatives will want to have access to the site to make periodic visits.
- d. Depending on the complexity of the project, it may be necessary for the government to provide approvals regarding the project's engineering at key stages.
- e. The government can only supervise the project if it has sufficient and timely information about the project to review, so contractual provisions should contemplate this need (Gorgens and Kusek 2010).
- f. The government cannot supervise the project if it does not have adequate and appropriate personnel for this task that are assigned to a monitoring role (Gorgens and Kusek 2010).
- g. Parties other than the government, such as development partners, will also have an interest in the project and will want to apply their own monitoring and evaluation standards. These should be harmonised with the government's rights under the contract with the contractor to enable a smooth supervision (Gorgens and Kusek 2010).



- h. The government may wish to appoint its own representatives, particularly an owners engineer for the monitoring of larger projects (Yong 2010).

Ultimately, the partnership relationship between the government and its private contractors is best served by a “no surprises” philosophy operating between the two parties.

#### **5.2.9 Managing the assets and outcomes evolving from the National Infrastructure Plan (Step 3i)**

All the work that the Infrastructure Management Unit has put into developing a standardised series of processes and documentation will bear fruit when it comes to managing the contracts and the assets created by them. For projects that involve a traditional procurement, a completed asset will be the result and this will be handed over by the contractor to a governmental agency upon its commissioning. The management role for government, therefore, is one of asset management and so it is important for the government to not only have an asset management plan regarding the infrastructure but also the capability and intention to carry out that plan. For more sizeable projects, it makes sense for government to require the contractor to produce an asset management plan as part of that scope of work. It may also be helpful for the contractor to provide training, including staff during a transition period to ensure that a smooth handover of the asset takes place.

For assets that will be operated by the contractor after the asset has been commissioned, the role of the government continues to be very much like the supervisory role described in Section 5.3.4 (h) described above. However, all contracts come to an end and this means suitable handover provisions need to be incorporated in the licensing agreement to ensure government ultimately receives an asset that is in good condition save for wear and tear. Government also needs to have the capability to take over the asset in a similar fashion to the transition arrangements discussed for traditional construction contracts above.

With this a productive cycle of infrastructure planning, implementation and control comes to an end, the product of which ought to be the best possible use of resources toward relevant infrastructure that is designed to produce national development goals addressing issues of economic development, sustainability and poverty alleviation.

### **5.3 Summary**

Infrastructure management is ideally a holistic process that starts with developing a vision for the type of society that people want. Whatever objectives are chosen by society, there is merit in encapsulating the use of a national plan, of which a subset should involve the role of infrastructure. There are some challenges to face in this regard because governments are not usually responsible for all of a country's infrastructure, conflicts of interest exist and differences of opinion are inevitable on questions of appropriate resource allocation.

Establishing a vision for society leads to the development, as far as infrastructure is concerned, of an overarching management system that is comprised of two main elements. These involve an Infrastructure Management Unit and a National Infrastructure Plan to be carried out by the unit. To be effective, the Infrastructure Management Unit must have appropriate legislative and political backing while being staffed and governed by appropriate personnel.

The day-to-day project activities of the Infrastructure Management Unit should be directed toward project-based activities, bearing in mind that any initiative that can improve infrastructure outcomes should be considered as a candidate. Following the application of socio-economic measurement tools, projects should be ranked to establish their priority. The ideal approach to development should be considered using the IADB Latin American model for developing countries and then a financeability test should be applied to identify what, if any, government support is needed.

These processes should be followed by use of procurement standards that have due regard to international good practices and the rules applied by development partners. The role for government then turns to monitoring and supervising projects, which is in itself a serious undertaking that completes the project cycle and application of an overall infrastructure management system. Having established a system, we turn now to an actual project to gauge the extent to which the system was applicable in that case.

## **Chapter 6: COMPARISON OF THE GOOD PRACTICE SYSTEM TO A CASE STUDY PROJECT**

When the water rises, the fish eat the ants; when the water falls, the ants eat the fish – Lao Proverb

This chapter takes the system developed in the last chapter, and compares it to an infrastructure project to see if the guidelines are applicable in that case. The Nam Theun 2 project in Laos is a good example, because it is a large-scale hydropower project in one of the poorest countries in the world. Issues of poverty reduction, using resources efficiently, sustainability, engaging with development partners and with the private sector were all major issues the project faced. This chapter is based on my fieldwork, the qualitative case study examining the Nam Theun 2 project, my own experience and project specific literature.

The project is used as an example of how privately financed hydropower can be developed, but it is not without its shortcomings, and while these are explored in this chapter, the aim of the chapter is to investigate the system and arrive at a series of lessons that can be learned for future projects. In this regard, the methodology in Chapter 2.7 introduced a number of key themes that emerged from the fieldwork, such as issues regarding Laos' legal framework, institutions, project selection, project modality, procurement and implementation, monitoring and evaluation. These are explored below in Chapter 6.2 and considered in the context of the good practice infrastructure management system developed in Chapter 5. The learning that results from this examination is not designed to be focused simply on Laos or on hydropower, but on the importance of having a structured governmental involvement in infrastructure development if the best outcomes are to be achieved.

Ultimately, by comparing the system against a large project the system itself can be revised so that the principal research question about what role government should have in setting an appropriate environment for public infrastructure development can be answered more fully.

As most projects (especially major ones), are highly customised, it is expected that there will not be a direct link between the Nam Theun 2 project and the system articulated in Chapter 5. Nevertheless, the comparison could prove to be instructive as a basis for dialogue surrounding best infrastructure management practice.

## 6.1 Introduction to the Case Study: The Nam Theun 2 Hydropower Project

Three percentage points of expected GDP growth of 7.8% in 2010 come from Nam Theun 2 – World Bank

### 6.1.1 Laos

Laos is a landlocked country in Southeast Asia. The country is located in the Greater Mekong Subregion with China to the North, Cambodia on its Southern border, Vietnam to the East and Thailand to the West. Myanmar and Laos also share a common border in the Northwest. The country was part of French Indochina, but became independent in 1953 (Encyclopedia Britannica 2010). Independence led to a period of uncertainty for Laos, as tensions increased between the communist Pathet Lao movement and the pro-government group that supported the monarchy. In 1975, Pathet Lao took control of the country and established itself as a communist republic called the Lao People's Democratic Republic, or Lao PDR (St John. R.B 2006, p. 20).



Laos has a population of about 6.6 million people, and Buddhism is the dominant religion. The official language is Lao. The adult literacy rate is 53 percent and life expectancy at birth is 54 years for men and 57 for women. Approximately 77 percent of the population live in rural areas, with subsistence agriculture as the main livelihood option. Agriculture provides about 40 percent of GDP. The main cities and towns are in the Mekong River area, with industry, trade, and much of the country's intensive agriculture located mainly in the plain of the Mekong (Nationmaster 2010).

A mountainous country, Laos has a high rainfall and deep river valleys that are well suited for hydroelectric generation. As former Vice Minister for Industry and Handicraft, Nam Viaketh, put it:

Kuwait pumps oil from the ground. In Laos, we are selling power made of the water from the heavens. (Perrin 2005).

The hydropower potential of Laos (including a part of the main-stream of the Mekong River) is about 26,500 MW. An inventory of the potential of hydropower in the main tributaries of the Mekong, was prepared by the Secretariat of the Mekong – the precursor of the Mekong River Commission in 1970. To date, less than 2,000 MW of hydropower potential has been installed in Laos. The country itself has a very limited demand for electricity compared to its potential supply. However, being a landlocked country surrounded by countries with very high electricity needs puts the country in a good position to export electricity (Energy Promotion Department of Laos 2010). Furthermore, demands of the people of Laos for electricity are likely to rise in future along with living standards.

### **6.1.2 Early History of Electricity Generation in Laos**

Laos' electricity generation history started in 1971 with the commissioning of the Nam Ngum Dam by the country's electricity utility, Electricite du Laos (EdL). The dam had an installed capacity at that time of just 30 MW, increasing to 150 MW by 1987. As of the early 1990s, only 20 per cent of Nam Ngum's generation was consumed domestically (primarily for supply to Vientiane, the capital) and the balance was exported to Thailand. Laos' second dam at Xeset in the country's South was commissioned in 1991 with a capacity of 20 MW (Azimi 2001, p. 44).

The Lao government in 1991 made the first engagement with the private sector for the delivery and operation in Laos of a power station for its whole economic life – referred to as an Independent Power Producer (IPP). Thailand's Shlapak Group was granted a concession to develop the Nam Ngum 2 site, and to operate it for a set period (Maunsell/Lahmeyer International 2004, p. 99). The issue of this concession marked a point when the government realised that to develop its hydropower resources fully it would require input from the private sector under a new policy.

Between 1991 and 2005, the new policy of engaging with the private sector for hydropower development sparked a wave of agreements. In this period some 33 Memoranda of Understanding (MOUs), Project Development Agreements (PDAs) and Concession Agreements (CAs) were awarded to various groups. Of these hydropower projects, only the Theun Hinboun (including an expansion), Houay Ho, and Nam Theun

2 projects have successfully been financed. All three of these projects have now entered into commercial operations (Norplan 2004, p. 36). The limited success is:

‘Not surprising, because the government was new to IPPs and the government signed away the rights to many projects that should have been looked at more rigorously’ (Former Government Advisor, Lao PDR, Interviewed June 2010).

Many of the agreements awarding projects to private sector developers followed a non-competitive process (Electricite du Laos 2006, p. 1). Often developers proposed projects to the government and entered into agreements proposed by the developers, rather than conforming to model documentation and standards set down by the government. The consequence of this meant that the government was faced with a multitude of arrangements with developers, and no particular standard regarding how matters important to the government should be determined. In part, the weak framework resulted from significant limitations to the government’s resources. The government, to its credit, introduced a series of institutional changes and commissioned a number of studies to deal with deficiencies that have since caused the IPP framework to evolve significantly throughout the course of the last few years (Maunsell/Lahmeyer International 2004, p. 23).

In 1999, the government issued a Power Sector Policy Statement (PSSS) to formally acknowledge the need for an IPP implementation framework (World Bank 2002, p. 22). While not formally adopted by the government, the statement helped progress a number of project evaluation studies, as tabulated below (Table 2).

**Table 2 – Principal Lao Power Sector Studies**

Study	Year	Funding	Subject
Strategy Studies:			
Hydropower Development Strategy Study	1999	World Bank	Rank domestic and export projects
Power System Strategy Study	2002	ADB	Domestic and export projects
Eel PDP – PDP2002-12, July 2003 (draft)	2003	EdL	Power system expansion.
Transmission Planning Studies:			

Study	Year	Funding	Subject
Establishment of Lao National Grid Company	1997	ADB	Technical legal and commercial.
Lao National Grid Study (Lahmeyer)	1997	Government	Development of national 500kV grid
Masterplan of Transmission Lines and Substation Systems	2002	JICA	Domestic grid development
Indicative Masterplan on Power Inter-connections in GMS Countries	2002	ADB	GMS grid development

Source: (Maunsell/Lahmeyer International 2004, p. 32)

In addition to the studies, practical experience has been gained through the development of individual projects – the most significant of which is the Nam Theun 2 project.

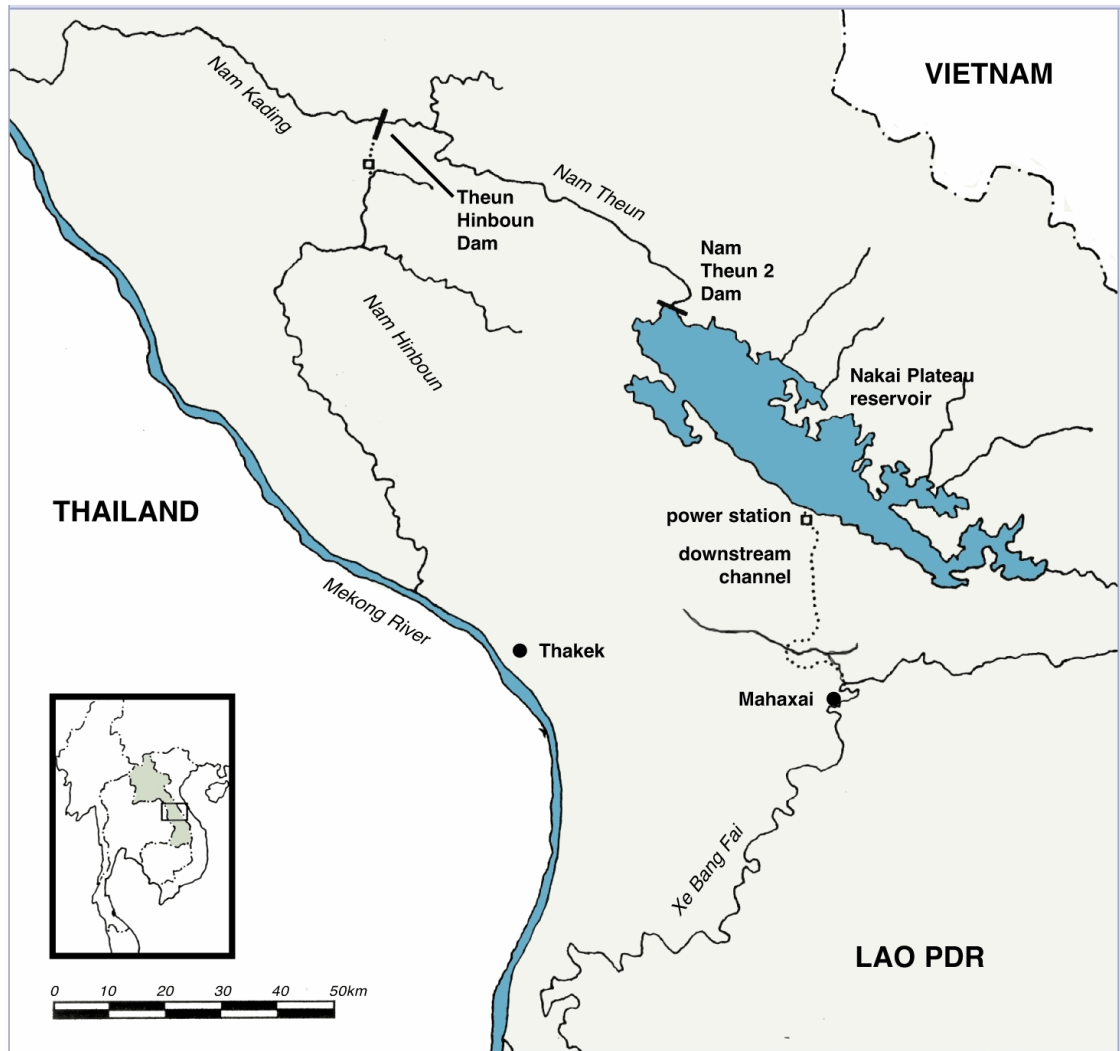
### 6.1.3 The Nam Theun 2 Project

The USD 1.5 billion Nam Theun 2 project commissioned in 2010 was considered by engineers to be a very appealing prospect many years before the project started development. The Mekong Secretariat identified the Nam Theun 2 site in the 1970s, when it was realised that a relatively small dam on the Nam Theun River in Khammouane Province would cause a reservoir to be formed on a large plateau known as Nakai. Water from the plateau could then simply be dropped over an escarpment and down to a powerhouse for electricity generation. The water could then be discharged into another river system, the Xe Bang Fai, down to the Mekong (Nam Theun 2 Power Company 2005, Preface). Figure 17 below illustrates the project's location relative to these river systems.

The World Bank agreed that the project was appealing, and in 1989 it funded a feasibility study that confirmed the case for producing electricity relatively inexpensively. The trouble was however, that back in 1989 Laos itself had very modest demand for electricity and its neighbours did not really need the electricity either. The project was therefore set aside for a number of years, and in the intervening period the Thai economy flourished and demand for electricity grew. With this growth came an improving business case for the Nam Theun 2 project.

The project has been developed by a project company called Nam Theun 2 Power Company (NTPC), which has a concession to do so from the government (World Bank 2005, p. 10).

**Figure 18 – Map of Laos and Nam Theun 2 Location**



Source: (International Rivers Network 2010)

The concession required the project to do much more than simply engineer and construct the physical works. The company also has substantial social and environmental obligations that run to around 300 pages in the concession agreement:

We weren't just a hydro development business, we became a development organisation. (Project Development Team Member, Lao PDR, Interviewed: June 2010).

NTPC is a limited liability company owned 35 percent by EDF International (EDFi, a wholly owned subsidiary of Electricite de France), 25 percent by Electricity Generation



Public Company (EGCO), 25 percent by Lao Holding State Enterprise (LHSE), a special purpose company wholly owned by the Lao Ministry of Finance, and 15 percent by Italian-Thai Development PCL (ITD). It is notable that of each of these organisations has a commercial remit, but all but one is owned by a government. The exception, ITD, is a publicly listed company on the Stock Exchange of Thailand (MacGeorge 2009, p. 3).

Under NTPC's project agreements, 995 MW of the project's capacity and generation is being exported and sold to the Electricity Generating Authority of Thailand (EGAT), under a take-or-pay power purchase agreement. A further 75 MW is being sold to EdL for local consumption on the same basis (World Bank 2005, p. 38).

Being an export project, the fiscal benefits to Laos come mainly in the form of royalties, taxes, and dividends from the project, rather than through supply of electricity. For this reason, a unique feature of the Nam Theun 2 project is a revenue management programme that is being implemented by the government as part of the conditions agreed with its development partners. The revenue management arrangements see the bulk of the revenues generated to the government being directed toward the priority development sectors of health, education, agriculture and transport. Over the projects initial 25 year operating period, the government's revenues from the project are estimated to be some USD 2 billion. Consequently, the project is a cornerstone for Laos' economic development (World Bank 2005, p. A5). Not all believe that the priority sectors should receive all the benefits from the project, however because:

“When you take the money away from the sector that is making it, how can we maximise returns for the country?” (Government Official, Lao PDR, June 2010).

Despite its economic attractions, there has also been significant opposition to the project. The International Rivers Network (IRN), an NGO concerned with environmental protection of rivers and the human rights of the communities that depend on them, has been one of the most outspoken critics of the project. In a publication issued around the time the project started construction, IRN stated that the World Bank should only support the project if poverty would be alleviated, but that this was not clear for four reasons:

- Revenues would be insufficient to “jumpstart development” in Laos.

- The Government of Laos would not use Nam Theun 2 revenues to alleviate poverty.
- Affected people would not be better off after Nam Theun 2.
- Laos had better alternatives to Nam Theun 2 (International Rivers Network 2010).

Probe International, another NGO but one that is focused on the adverse environmental and social impacts of Canada's international activities, also had reservations about the project. In 2004, Probe cited 10 reasons why the project should not proceed, and these were themed along questions about the project's economic and financial viability, and the project being a monopoly not subject to competitive bidding. Probe was also concerned that EdL would be forced further into debt, and it felt that the Lao people would be better served with cheaper off-grid power schemes (Ryder 2004).

NGOs also raised concerns about the adequacy of the project's social and environmental budget. Particular concerns focussed on the ability for the Government to enforce project breaches of environmental conditions, villager grievance mechanisms, livelihood plans, and compensation.

The World Bank rationalised its involvement with the project on the grounds of the project's social, sustainable, economic development potential, and as a driver of reform. The Bank also realised that few organisations had the skills needed to help the Government of Laos with such a large and environmentally sensitive project, nor was the project financeable in a country of limited credit standing without guarantees from international development partners (World Bank 2005, pp. 6-7). The Bank was aware of opposition to the project, and decided to proceed subject to significant due diligence (World Bank 2005). Concerns from civil society contributed to the project having development costs of USD 70 million, and a further USD 49 million was set aside for social and environmental mitigation (World Bank 2005).

While the project faced criticism on environmental grounds, it can be seen from Probe International's concerns that there were also social, economic and commercial reservations about the project. These are the questions that an infrastructure management system seeks to address and are the subject of the following section.

## **6.2 Good Practice Infrastructure Management System as Applied to Nam Theun 2**

Hydropower is complex and brings a range of economic, social and environmental risks. Some are inherent in the sector; many can and must be addressed by thoughtful implementation of good practices and a commitment to a sustainable, triple bottom line approach. (World Bank 2009, foreword)

### **6.2.1 Policy and Legal Framework Supporting Nam Theun 2**

Supporting the 1999 Power Sector Policy Statement mentioned in Section 6.1.2 is the Lao legal system, which is based on traditional customs, French law, and socialist practices. The legal system is not based on precedent, and there is no body of case law to provide guidance regarding the attitude of the Lao courts for cases, so it is difficult for stakeholders in major projects to rely fully on the judicial system in Laos.

Legislation in Laos is not strong, but it has improved markedly since the introduction of a New Economic Mechanism (NEM) which was adopted in 1986 when the government decided that the country should engage more with the international community (Saignasith 1997, p. 26). Legislative milestones since the NEM that are especially important to hydropower include: a Law on Foreign Investments (1988), the Water and Water Resources Law (1996), the Electricity Law (1997), and an Environmental Protection Law (1999).

Notwithstanding improvements in legislation regarding hydropower projects, the legal framework was not strong enough for developers to rely on legislation without having a comprehensive agreement that addresses legislative shortcomings. Consequently, for each hydropower project developed, there has been a central project specific agreement that has been negotiated between the government and the development group, with Nam Theun 2 not being an exception (Porter and Shivakumar 2011). In any event:

“The legislation in Laos was not strong enough to avoid having to develop a very detailed concession agreement” (Government Advisor, Lao PDR, Interviewed: June 2010).

### **6.2.2 Institutional Setting for the Project**

The current organisation of the electricity sector in Laos has electricity sectoral responsibilities shared amongst a number of government ministries, departments, agencies and committees (Energy Promotion Department of Laos 2010). The organisations that are particularly important to hydropower development include:

- a. The Ministry of Energy and Mines (MEM), which has overall responsibility for power sector development.
- b. Electricite du Laos, which is the state owned corporation operating under the Ministry of Energy and Mines. EdL owns and operates the main domestic generation, transmission, and distribution assets in Laos. EdL was also a shareholder in NTPC, the company developing Nam Theun 2, but it transferred its shares to a special purpose company owned by the Lao Government because Laos' development partners were concerned about the utility having conflicting roles. They were also concerned that dividends from Nam Theun 2 would end up subsidising the retail tariff charged to domestic electricity consumers, rather than being channelled towards better poverty alleviation purposes.
- c. The Water Resources and Environmental Agency, which is the main co-ordinating agency for environmental planning and management across all government sectors;
- d. The Committee for Planning and Investments (CPI), which is the agency charged with the responsibility for entering into commitments with IPP developers and it therefore signs the MOU, PDA, and CA documents on behalf of the government.
- e. The Energy Promotion Department (EPD), improves coordination between MEM and CPI in the evaluation, negotiation, and approval of IPP projects. EPD effectively represents the sovereign interests of Laos in IPP projects and operates in the capacity of a contracting authority representative for CPI.
- f. The Ministry of Finance (MOF) is responsible for implementing government's fiscal and monetary policies, either by direct control or through the Central Bank of Lao PDR. In the context of IPP development, the MOF approves loans and issues sovereign guarantees on behalf of government and it is the owner of LHSE (which is discussed below) which is the government's shareholder representative in Nam Theun 2.
- g. Lao Holding State Enterprise (LHSE), which owns 25 percent of NTPC as the government company set up to hold the government's shares in NTPC and other IPPs that are expected to export electricity to neighbouring countries. The government has a policy under its 1997 Electricity Law to be a shareholder in IPPs as a matter of policy (Lao National Assembly 1997, Article 12). This is

somewhat counter to international usual practice, which sees governments generally making fewer investments in infrastructure. There is an argument in favour of government investment in hydropower IPPs, but a major practical impediment is the Lao government's inability to raise the very large amounts of capital needed for investment as:

“The government can barely afford the shareholding it has now” (Banker, Singapore, Interviewed: June 2010)

### **6.2.3 The Process of Identifying and Prioritising the Project**

The project did not process through a system like the system described in Chapter 5. It was instead, a rather more piecemeal affair with studies being commissioned after the fact to check whether the project was the least cost solution and ought to be ranked highly in the socio-commercial order of projects (White 2008, p. vii). This is evidenced by a number of studies including a “Study of Alternatives”, a “Least Cost Analysis”, a “Regional Impact Assessment” and (more generally) through the development of a “Power Sector Master Plan” (Elston. J and Walker. A 2005, p. 59). These studies were not called for as a result of a systematic infrastructure management system being applied. Instead, they were more a requirement of development partners satisfying themselves that their own internal processes were being followed. It is unlikely therefore, that the project would have had the same degree of scrutiny had it not been for the involvement of the international financial community as:

“The involvement of the development banks improved the outcomes, but it was painful” (Government Official, Lao PDR, Interviewed: June 2010).

Their involvement brought about a further layer of scrutiny, as international agencies and civil society examined the project, primarily through NGOs (Goldman 2001, p. 193).

The involvement of development partners made up for shortcomings in the fledgling Lao infrastructure management system, but

“the [development] banks should have had larger, more permanent teams on the ground” (Project Development Team Member, Lao PDR, Interviewed: June 2010).

It had a further benefit, in that the Government's resolve was strengthened by the presence of external development partners (even if at times this was unwelcome), and a

process (even if project-specific rather than holistic), could be followed rigorously because the government-developer balance was more evenly matched than it otherwise would have been (Lebel, Garden et al. 2005, p. 18).

A lesson, therefore, is an infrastructure management system that is applied with vigour and without exception is an ideal, but can be substituted by a project specific system if the project is large enough and the processes of development partners can be leveraged as a proxy.

#### **6.2.4 Designating the Project's Form of Cooperation and Procurement**

Section 4.2.4 (d) explored the traditional approach towards Value for Money and concluded that the developed world public versus private type of approach is not always appropriate in a developing country context. This was most certainly the case in Laos in 1993, when decisions were being made about the project. At that time, the country had developed less than 200 MW of electricity generating capacity and it had no realistic prospect of developing a single project many times that size. Even countries with a long history of hydropower development would consider Nam Theun 2 to be a “worldscale” project. In addition, Laos was faced with “weak human capacity, governance, institutions and physical infrastructure” at the time (Porter and Shivakumar 2011). The government was therefore not in a position to develop the project itself as

“NT2 couldn't have been a public project because it was lacking in the skill and capacity to prepare and develop the project” (Project Development Team Member, Lao PDR, Interviewed: June 2010).

The alternative was to engage with the private sector for the development, construction and operation of the project. A whole of life approach was the only realistic way of attracting commercial interest, but this was complicated by there being very little experience of contracting hydropower development on that basis anywhere. Part of the difficulty lies with the problem of trying to procure a developer using approaches normally used for major engineering projects (Head 2000, p. 16). Hydropower development costs, unlike most other types of power station projects, are extraordinarily site-dependent, so it is not possible to know the cost of the project and the consequent electricity tariff needed to recover those costs without a great deal of site investigation. Developers are simply not interested in committing the necessary time and expense, unless they are certain about their rights to develop the project. Consequently,

competitive tendering for hydropower projects on a whole of life basis (as discussed in Chapter 5.2.1) is not readily achievable. Another approach to procurement was needed (MacGeorge 2009, p. 29).

To recap so far in this subsection, if an infrastructure management system of the type described in Chapter 5 had been applied to Nam Theun 2, the project would have passed through the stages of candidate listing and been highly ranked. It proved that the project was financially viable, and could therefore be developed by the private sector. It also could be determined that no public form of cooperation was feasible because of human and capital constraints alone. A public-private partnership was inevitable therefore but the procurement approach was problematic, because it was known that competition to select a developer would fail given the circumstances.

The answer to the procurement challenges lay in the decision to negotiate with a group of developers that had the balance sheet strength and experience needed to develop the project, but also the sense of corporate citizenship that was needed to deal responsibly with a government that had a limited, but growing capability to act as a strong counterpart because:

“Even though the project is a PPP, most of the shareholders are publicly owned and this made a big difference” (Government Official, Lao PDR, Interviewed: June 2010).

To help the negotiation, the government, with the help of the World Bank, appointed legal and financial advisers early in the process. This enabled the Nam Theun 2 project to stand apart from the many sub optimal hydropower agreements that were being struck with other developers in Laos around that time. The government’s advisers did not have the benefit of clear standardised processes and documentation in Laos, but they had international experience, and what is more, they managed to get the government to agree to take control of the documentation process rather than let the developer take the lead. Government taking control over documentation is an element of infrastructure management best practice, and so this was a feature discussed in Chapter 5 that was incorporated in the government’s approach (MacGeorge 2009, p. 10).

The process that was subsequently applied to procuring the Nam Theun 2 project developer, was for the government to enter into a Heads of Agreement in 1994 with the development consortium, which consisted of Transfield of Australia, EDFi, and several Thai companies at the time. It was agreed with the developer that as there could not be a

full competitive tendering for developer selection, EDF would lead construction as the “head contractor” (Porter and Shivakumar 2011), and that competitive tendering for as much of the project’s construction as possible would be pursued, and this would be done on an open book basis, meaning the government and its development partners could scrutinise the contracts. This led to the World Bank commissioning a report from Swiss firm Colenco, to determine whether the project construction costs were reasonable (World Bank 2005, p. A104). Again, the involvement of development partners proved to be pivotal in the absence of having a clear infrastructure management system. While “The role of the World Bank in a project is sized to the scale and complexity of the project” (Porter and Shivakumar 2011, p. 129), a lesson for development partners is that it is arguably easier to assist with the development of a good infrastructure management system, than to become embroiled in the specifics of individual projects. Only large projects warrant this degree of input.

#### **6.2.5 Deciding on the Degree of Government Support for the Project**

While the government did not have to finance, develop, build, or operate the Nam Theun 2 project, it did need to provide an enabling environment so that the development company, NTPC, could carry out those functions and be monitored to ensure compliance (Porter and Shivakumar 2011, Chapter 2). Linkages of the project to Laos’ poverty reduction strategy, economic reforms, and strengthening institutions all formed part of the effort to ready the country for the project.

The project was financially feasible (World Bank 2005, p. A144) without direct government support by way of viability gap funding for example, which was fortunate because the country did not have the capacity to provide any significant support anyway. Indirectly though, the government was required to meet its financial obligations as a shareholder and this meant raising USD 87.5 million as “base” equity to finance its shareholding, and a further USD 25 million in “standby” equity should the project cost more to build than expected (World Bank 2005, p. 19). The government had no option but to seek funding from its development partners by way of loans and grants. If the government had not been able to do so, the project’s private shareholders would have needed to raise more capital or found an additional partner, which would have been achievable. Government financial support as a shareholder was therefore not key to the project’s success (Lebel, Garden et al. 2005, p. 18), but:



“The government’s shareholding helped convince us that it was serious about the project” (Banker, Singapore, Interviewed: June 2010).

Another form of indirect support in this case that was crucially important to the project and its developers related to the introduction of the World Bank and other development institutions to the project in the mid 1990s. The development consortium had hoped that it would be possible to finance the project without involvement from the development banks, mainly because the application of their standards and processes would slow the project’s development. This incidentally, proved to be the case because development banks had for many years shied away from hydropower projects and to re-engage with hydropower meant updating their approaches to social and environmental issues (Economist 2003). In any event, from a financial perspective the World Bank and the ADB provided partial risk guarantees to commercial lenders to the project, and without these the project would not have been financeable. This is because commercial lenders were not willing to take the risk of the Lao government defaulting on its obligations under the concession agreement with NTPC, being required to make a payment in consequence and failing to do so because of the poor credit standing of the country. The purpose of the partial risk guarantees was to “backstop” that potential payment default. In return for providing these guarantees, the World Bank and the ADB required the government to agree to counter-indemnify them should the guarantees be called. In doing so, the government was providing contingent financial support to the project (World Bank 2005, p. A208).

In addition to raising equity and counter-indemnifying development banks, the government provided support to the project in a range of other ways and these included: providing land-use rights (as foreign investors and nationals are not permitted to own land (ASEAN 2011), access roads and utility services to NTPC; providing support for consents to build the project; granting exemptions from certain taxes (which is counter to good resource taxation policy (Boadway and Flatters 1993) but needed to make the project financeable) and employment laws (with the trade-off that Lao nationals be preferred by NTPC for employment); undertaking not to change laws that would adversely affect NTPC’s position, and in giving certain protections regarding currency transferability (Nam Theun 2 Power Company 2005, pp 7-8).

When the government support measures are considered together, the country ended up providing a minimum of support (substantial as it nonetheless was) but this was not

measured formally by lining up the possible forms of cooperation and comparing the likely government support requirements for each to arrive at a formal judgement about which form was theoretically the best. This raises an issue about how sure analysts can be when considering different forms of cooperation/government support options because often the options require detailed information that can only be obtained by implementing the project. This suggests that, however good an infrastructure management system might be, there will be occasions where it cannot be applied fully and a case-by-case approach is needed instead. That is not to say that an infrastructure management system does not have a role by any means, but what is needed is recognition that sometimes there will be exceptions. Those cases need to be minimised by allowing the system to evolve but exceptional projects will nonetheless occur. One way to build exceptional cases into the system is to review agreements when a project has been completed and to then decide which aspects of those agreements can be imported into the system to further reduce the chances of exception projects in future.

#### **6.2.6 Implementation, Monitoring and Evaluation**

The Nam Theun 2 project (like other schemes), has three distinct phases, being development, construction, and operation. In time there will be a fourth phase when the project is handed back to the government. The government's most significant involvement in the project was during development and this is true for the development of a holistic system too. First the "machinery" must be designed and developed and then it can be allowed to run. Once the project started construction, the role for the government became one of monitoring and evaluation and in this regard four layers of supervision resulted for the project. First, the project company employed an "owner's engineer", then the project company's financiers employed a "lenders engineer", next the government employed its own engineer and finally the World Bank (supported by the other development banks involved) employed a Dam Safety Review Panel and a Panel of Experts, for general oversight. Other than for dam safety, each of these groups were concerned about social and environmental matters too (MacGeorge 2009, p. 46).

Several issues are notable regarding monitoring and evaluation and these were:

- a. There were too many layers of monitoring.
- b. Government devolved some monitoring responsibility to World Bank experts when it should have stepped up more fully to these roles.

- c. Specialist project-specific agencies being established by the government when these ought to have been incorporated within existing structures.
- d. The concession agreement between the government and NTPC was very prescriptive and this did not allow for adaptive management as the project was constructed. As one respondent said:

‘the developer should be allowed flexibility to respond to issues as they unfold’ (Project Development Team Member, Lao PDR, Interviewed: June 2010).

- e. A fusion between Lao environmental standards, World Bank safeguards and commercial bank adherence to the Equator Principles (a common set of environmental and social standards agreed by commercial banks) needed to be agreed so that common social and environmental standards could be employed.

In the event, monitoring and evaluation of the project while cumbersome has worked well but only because it was purpose-built for the project.

The project had a number of issues regarding resettlement by comparison to base expectations, such as establishing new livelihoods, flooding affecting the resettlement process, a need to supplement resettlers diets for a lengthy period, balancing developer inputs versus resettler autonomy and resettlers making the transition from hunting and gathering to steady state agriculture (Nam Theun 2 Panel of Experts 2010).

International civil society has also paid close interest in the project. NGOs, which play an important counter-balancing role, have been quick to point out what they perceive to be project shortcomings. In December 2010, IRN wrote to the World Bank to express its concerns about the project from a social and environmental viewpoint. With regard to resettlement, IRN said that:

There is little doubt that the families on the Nakai Plateau have better infrastructure, such as houses, electricity, access roads, schools, and health centers. However, one of the key pillars of the livelihood program, agriculture, is still highly questionable (International Rivers Network 2010).

IRN also raised concerns about encroachment of the resettlers area by outsiders and noted the unknown risks downstream of the project where over 100,000 people live. Science Magazine published an article in its April 2010 edition in which similar concerns were expressed by an unnamed water specialist who said:

Diverting a large amount of water from one river basin to another, via a large reservoir with deoxygenated and eutrophic water in it, will greatly change the hydrology and water quality of the Xe Bang Fai (Stone 2010)

Management of these issues are contemplated in the Concession Agreement between the government and NTPC and have led to additional costs that were borne by the project company. The Concession Agreement also provides for the appointment of an independent Panel of Experts, which comprises three leading social and environmental proponents. The Panel of Experts was appointed to assist the Government with monitoring were granted wide-ranging powers under the Concession Agreement:

‘they could be difficult, but they always played with a straight bat and were reasonable in their expectations’ (Project Development Team Member, Lao PDR, Interviewed: June 2010).

### **6.3 Project Comparison with Holistic Infrastructure Management**

The Nam Theun 2 project is an exceptional project in that it carries the idiosyncrasies inherent with hydropower and it is large relative to the size of Laos’ economy and stage of development. Its nature and size would make it hard to fit the project into a well-developed infrastructure management system in a well-developed country. Looking back, it is possible to say that the project could in an ideal world have been less developer-led in its early stages, giving the government time to align policy and planning to see whether the project was socio-economically attractive and highly ranked. It would have also been possible, in this ideal world, to have considered at more leisure which form of cooperation was most appropriate and it is possible that the government might have sought funding so that its own investigations could have been carried out, possibly allowing for a competitive tender for the developer role.

Figure 18 below shows the good practice system developed in Chapter 5 and highlights (i) those areas that were followed for Nam Theun 2, (ii) those areas that were followed in part and (iii) those that were effectively not followed. It can be seen that neither a National Infrastructure Unit nor National Infrastructure Plan were established, into which the electricity sector plan could be folded. However, National Infrastructure Units and Plans were only just evolving elsewhere in the world and this could hardly be a criticism therefore. Instead, Step 2 was largely delivered at a sector level through the establishment of the Electricity Law 1997 that provided for both engaging with international investors in IPPs and the Government having a shareholding in those

projects (Lao National Assembly 1997). The essence of Step 2(b) is to establish a means of comparing infrastructure projects across different sectors and this was absent in Laos, but dealt with at a sectoral level under Step 3(b).

Where Nam Theun 2 was not considered as part of a National Infrastructure Plan, it was evaluated in the context of a sectoral plan in the form of the 2004 Power Development Plan. This found the Nam Theun 2 project to be the least cost generation project in Laos (Maunsell/ Lahmeyer International 2004), although the project was well into its development phase at this point and the least cost evaluation should have been undertaken before the project developer was appointed in the early 1990s. Nonetheless, Steps 3(a), 3(b) and 3(c) were all applied to Nam Theun 2.

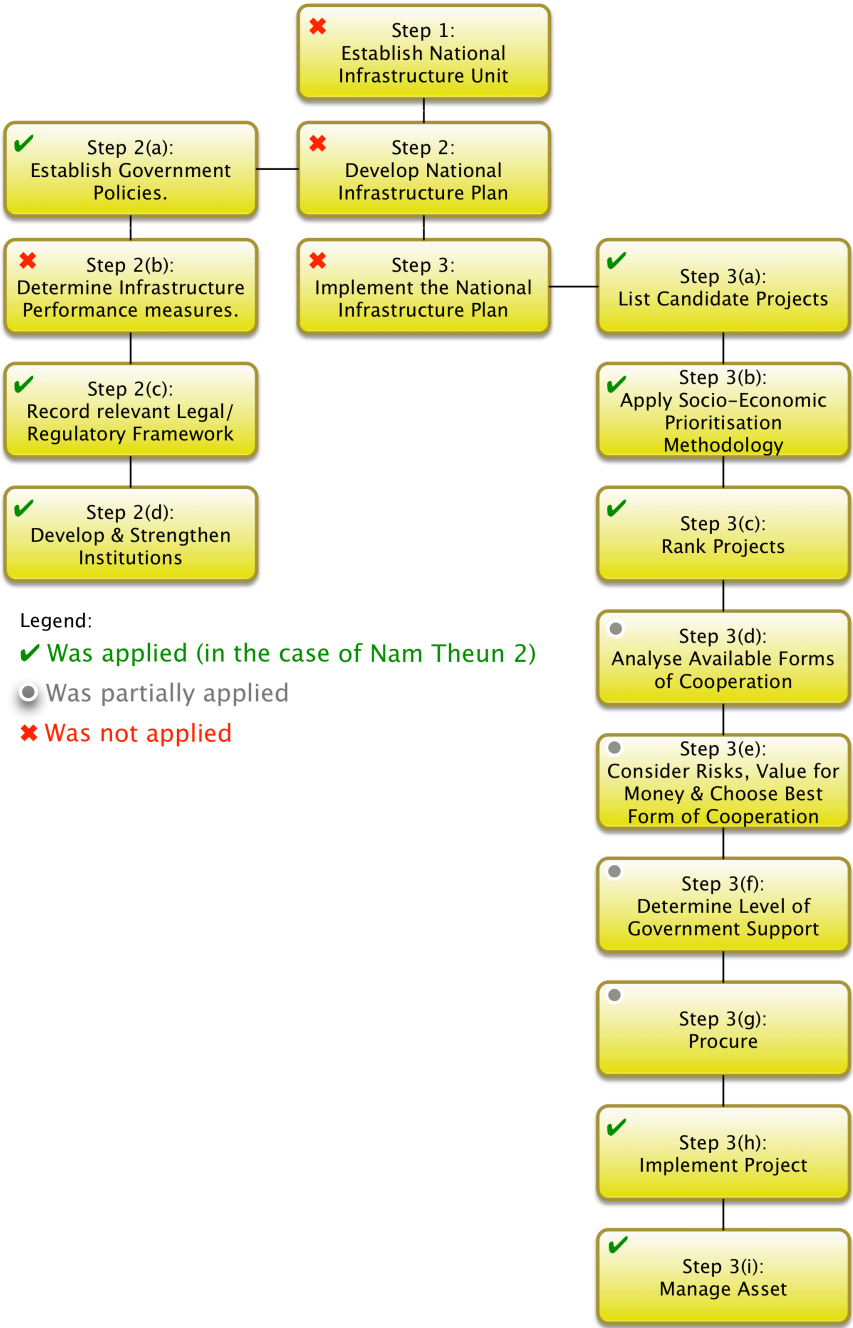
A limited amount of time was spent on considering the various modalities that might have been applicable to the project's development - the literature is silent on this issue as well. In part the lack of examination of potential financing models of the type discussed in Chapter 5 was because decisions about developer selection were made in the early 1990s when the Government of Laos had little more than a policy to engage with the private sector, rather than having a robust framework. In reality, had that evaluation been undertaken, it is unlikely that any model other than a concession or build-own-operate model would have been workable anyway.

On the issue of government support, the Government of Laos does not have a strong credit standing and has the lowest score assigned by the OECD (OECD 2011). For Nam Theun 2 this meant international commercial banks would be unwilling to accept the risk of the Government defaulting on its payment obligations should the government breach the project's concession agreement. Any government support would need to be enhanced by a third party, like the World Bank and the ADB for the banks to take such a risk. While a viability gap type of analysis suggested in Chapter 5 could have measured Government support, in the case of Nam Theun 2 it was measured by reference to the level of support needed to get banks involved in the project. The result is much the same between both approaches, but the viability gap approach is more holistic because it balances the needs of customers, investors and lenders.

We have seen that the procurement of the developer for Nam Theun 2 was not made competitively because Lao government policy was evolving and because hydropower has vagaries not common in other types of major infrastructure. However, instead there

was competition for much of the construction package elements and the reasonableness of the resulting prices were verified independently. The lesson from this for the Infrastructure Management System is to procure developers competitively where possible, but to accept that not all projects will present that opportunity.

**Figure 19- Comparison of Proposed Infrastructure Management System with Nam Theun 2**



Steps 3(h) and 3(i) have evidently been carried out, which leads the discussion to an overall assessment of Nam Theun 2 by reference to the Infrastructure Management System set out in Chapter 5. On this it is clear that much preparatory work was needed

to upgrade the country's infrastructure framework to prepare the country for the project, but it was not only the government of Laos that needed preparatory efforts. The project was being developed and analysed in a post World Commission on Dams backdrop (Imhof and Lawrence 2005, p. 16) and around the time of a pivotal "Good Dams, Bad Dams" publication by the World Bank as it ruminated over its past experiences, climate change issues and the nonetheless significant impact of major hydropower projects (Ledec, Quintero et al. 1997, p. 15). Consequently, even if the government had a robust framework in place entirely of the sort enunciated in Chapter 5, its reliance on development partners and the state of flux caused by hydropower's evolution meant that the "slowest person on the field" would dictate the pace of development come what may.

In short, the systems that the Lao government had in place at the start of the Nam Theun 2 project development period were suboptimal, but they improved in response to the project's needs. The lessons learned from the project now need to be built into the system and, more importantly, they need to be applied to future projects, but there are doubts about whether the lessons are all being applied. As Porter and Shivakumar state in their book "Doing Dams Right", Nam Theun 2 "should not become an "enclave" – the fate of many large scale projects in poor economies" (Porter and Shivakumar 2011).

## Chapter 7: CONCLUSIONS

This chapter provides an opportunity to reflect on how effective the methodology and data collection has addressed the research question. The thesis is then summarised and consideration is given to the role that government has regarding public infrastructure, and how that role ought to be performed. This leads to a series of conclusions and recommendations about the relevance of the research in the field of developing country infrastructure.

### **7.1 Thesis Summary**

#### **7.1.1 Purpose of the Research**

The principal research questions addressed in this thesis involve understanding what the role of government is in setting an appropriate environment for public infrastructure development? To do so required understanding why infrastructure is important to development, how managing resources well leads to better outcomes, and why it is essential that infrastructure management is therefore dealt with better. To answer the research questions, a series of objectives needed to be achieved, including: (i) understanding the relationships between infrastructure, development and the role of government; (ii) examining how infrastructure has been developed and operated through the ages; (iii) building a set of good practice guidelines for infrastructure provision that draws on current good practices in infrastructure; (iv) examining the system by reference to an actual case; and, (v) concluding with what interventions governments should be making with regard to infrastructure. Each of these objectives is oriented to the needs of developing countries.

#### **7.1.2 Relationships between the State, Infrastructure and Development**

For the State to have a role in the development of public infrastructure, the development focus should be clear. Questioning the role of the State in infrastructure development involves questioning the role of the State itself. The neoclassical view is that the State exists to promote economic stability, provide infrastructure and public goods, correct market failures and redistribute income to the poor. These functions were strengthened during the developmentalist period, and then weakened during the post-developmental period by influences such as globalisation (McMichael 2004)



(Schuurman 2000). At the same time, globalisation has raised the prominence of global institutions, and these institutions primarily have a relationship with the State. In turn, this has increased the relevance of the State even if local governments and the private sector are now assuming some of these functions. Therefore, the role of the State has not been lessened but redefined (Schuurman, 2000). For infrastructure, this means that the State is not necessarily the provider of all the inputs that go into making a public service possible. Instead, it has an important role to play in setting policy, providing a planning function and facilitating the development and operation of infrastructure.

Having understood the relationships between the State and development, attention was given to the role of infrastructure and development. First, we need to understand what public infrastructure is, and this can be defined as involving capital goods that are operated to provide services to society. Some types of infrastructure benefit society, but the costs cannot be covered on a user pays basis. This type of infrastructure is called social infrastructure, and most public health, education, and correctional services fall into this category. The other major type of infrastructure is called economic infrastructure, and this includes services that can fully recover costs from end users. Power systems, water and wastewater services, and telecommunications are examples of economic infrastructure.

Infrastructure proved to have undeniable relationships to economic development and to helping alleviate poverty. However, not all infrastructure development is necessarily advantageous. It must be sustainable so that not only are resources used efficiently, but benefits of the infrastructure concerned outweigh the costs. These costs and benefits are not just those directly associated with producing the infrastructure. They also include positive and negative externalities (side effects) of a social and environmental nature that must also be measured and factored into the decision making process. For projects that have net positive social benefits (and admittedly the measurement of those benefits is still difficult), then infrastructure is important to development from a range of perspectives.

Having established that government and infrastructure are important to development, this thesis explored what sort of system best exemplified the role of the State and government so that infrastructure outcomes can be optimised. To do this means I had to understand how infrastructure provision has evolved over time. This necessarily

explores the evolution of infrastructure in high-income industrialised countries, but some analysis of the implications for developing countries was made.

### **7.1.3 The Evolution of Infrastructure Provision and Implications for Developing Countries**

Chapter 4 discussed how historically, infrastructure provision has involved both public and private sector interventions. Over the last 300 years, there has been no fixed pattern of ownership or regulation. Over time however, society has increasingly come to value infrastructure from a public perspective, and this caused increasing public involvement in infrastructure in Europe, but less so in the United States. The State played a pivotal role in infrastructure and the Bretton Woods Institutions through the 1950s and 1960s mirrored this philosophy as modernisation theory was applied in development.

Modernisation, together with its dependency and world system theory derivatives, failed however, partly because to overlap industrialised Western experience was inappropriate to local settings.

These philosophies were replaced in the 1980s by U.S/ U.K New Right structural adjustment programmes that were underpinned by liberalisation, manifested through deregulation and privatisation. There were limited lessons for developing countries from this period however, because these countries were more concerned with increasing their infrastructure stock rather than managing existing infrastructure better. What had been learned was that the private sector could also help develop new infrastructure, so private sector involvement in infrastructure in Asia and Latin America was oriented towards financing discrete projects on a private basis using project finance techniques. During the late 1980s and 1990s, an explosion of project finance occurred in emerging markets, but the approach had very little crossover with international financial institutions like the World Bank and regional development banks, which were all but absent from the project finance market. They chose instead to provide technical assistance *vis a vis* infrastructure to governments, but this policy needed revision after the infrastructure market collapsed following the Asian Crisis.

In the United Kingdom, the Private Finance Initiative evolved thinking around what are now called public-private partnerships. These are a systematic process that involves selecting projects, deciding how they will be financed, and procuring a public or private provider to deliver services sometimes for the whole of an infrastructure asset's life.

Chapter 4 concluded that government plays vitally important roles of planner, procurer, and regulator of projects, especially those in which the private sector has a role.

There is now a need to improve how governments plan infrastructure, moving away from the convention of various arms of government having primacy to a more co-ordinated national effort, usually through National Infrastructure Plans.

#### **7.1.4 Good Practice Considerations for an Infrastructure Management System**

The evolution of the state's role in infrastructure over the last few decades, has resulted in government leading policy, planning, and procurement of public infrastructure, but not necessarily leading the delivery of the infrastructure itself. It was shown in Chapter 5 that a framework for making decisions about who provides the actual infrastructure together with a whole host of other factors is needed.

Governments would do well to consider what type of society people want to have holistically, rather than in pure economics terms. It is important to reflect society's needs in a National Development Plan and, in the case of infrastructure, a National Infrastructure Plan, which should be the primary manual explaining infrastructure policy, legislation, institutions, planning, and project processing. A centralised Infrastructure Management Unit should then carry out the plan.

It was proposed in Chapter 5.1.7 and illustrated in Figure 9 that implementation of the National Infrastructure Plan should involve nine steps, which are: (i) listing candidate projects – which could be any initiative that will lead to better infrastructure outcomes; (ii) measuring projects net benefits; (iii) prioritising projects; (iv) considering ways that each project can be implemented; (v) choosing the best approach; (vi) determining what level of government support is needed for the project; (vii) procuring the party who will deliver the project; (viii) implementing the project and; (ix) managing the result.

Much work for the Infrastructure Management Unit comes in the development of standardised processes and documentation. Once these are in place, deciding the best approach for each project becomes clearer. This is especially so, if decisions are made around the option that requires the least support from Government rather than relying solely on the developed country approach of best Value for Money.

Chapter 6 overall, established that infrastructure could be managed best by government through an Infrastructure Management System as illustrated in Figure 9 that delivers the

outcomes sought in a National Infrastructure Plan, which is managed by a centralised Infrastructure Management Unit.

#### **7.1.5 Comparison of the System to a Case Study Project**

A project that is considered by many to be well developed was reviewed to see how it rated by reference to the proposed Infrastructure Management System. The project is the Nam Theun 2 hydropower scheme in Laos. The country is not well developed and the USD 1.5 billion Nam Theun 2 project was at the time larger than the capacity of the country to develop. However, in the early 1990s it became clear that Thailand's demand for electricity was enough to warrant developing the project.

Hydropower is important to Laos because it has the potential to develop some 26,500 MW of capacity, which is appealing to its many energy-hungry neighbours. Before Nam Theun 2 started to be developed, Laos had only installed about 200 MW of generating capacity, but it had allowed itself to be overrun with many agreements of variable quality with private developers when the Lao government decided in the mid-1990s to open its doors to the international community.

By the late 1990s, the government was beginning to establish a framework for hydropower development by the private sector, and only two projects were developed in that time. The Nam Theun 2 project offered an opportunity to establish a new model for hydropower development. By then however, several of the steps in the Infrastructure Management System proposed in this thesis had been missed, including a systematic approach to project candidacy, prioritisation, selecting an appropriate form of cooperation, and in selecting the developer to carry out the project. Instead, an ad hoc approach was taken and the project served as a foundation for strengthening policy, laws, institutions, and people.

The project did not fit neatly into an Infrastructure Management System covering all sectors, but did in the context of the electricity sector. Establishing a hydropower development framework involving the private sector started in Laos in 1986 with the establishment of a New Economic Mechanism. This mechanism was strengthened during the 1990s with foreign investment, water, environmental, electricity laws, and with a power sector policy statement in 1999. Unfortunately however, these legislative improvements were not sufficient for international organisations involved with

developing the project and this led to the drafting of a very comprehensive concession agreement.

It was not possible to rely on a competitive tendering process to select developers for the Nam Theun 2 project because of the complexities of hydropower. Hydropower falls outside the standard approach to procuring a developer put forward by the Infrastructure Management System promoted in the thesis. As an alternative to competitive tendering for the developer role, competitive tendering was a requirement for the construction sub-contracts to the project and these were the subject of external audits.

The government of Laos, as part of its electricity law, required a shareholding in the Nam Theun 2 Project Company (NTPC). This is perhaps unusual in an environment where governments are looking to maximise private-sector involvement in the infrastructure investment, but the investment had a number of advantages for the government. These included having a voice on the board of the project company, an opportunity for information flow, exerting some control on the project company and for capacity building purposes. For infrastructure projects of national significance, Government investment should be considered as an exception to the prevailing philosophy of minimising public investment in infrastructure that the private sector can finance.

The most significant financial support the government gave to the project company was through share ownership and the provision of counter-guarantees to the World Bank and the Asian Development Bank. These enabled the development banks in turn, to provide an underwriting of the Lao government's obligations and the concession agreement to the project company's commercial lenders. Without these guarantees, the project would not have been bankable, but the counter indemnities turned out to be the most efficient way the government could support the project with its limited means.

A major reason why the Nam Theun 2 project was successful by comparison to the wash of projects the government had awarded to private sector developers was because development partners were involved, good quality developers were involved, and the party appointed advisers that helped level the playing field between the government and the developer.

The involvement of development banks without question slowed the rate at which the project could be developed and financed, but ultimately the project was financeable and

the project has been developed in a manner that will provide substantial net benefits to the country. The only other hydropower project that has been developed in Laos to date, that can boast these credentials, is the Theun Hinboun project. It is no coincidence that this project is the only other hydropower project to receive substantial development partner support.

## **7.2 Research Conclusions**

In Chapter 1.2, the principal research question about whether government has an important role to play in setting an appropriate environment for public infrastructure development was posed. I set out to achieve a number of objectives, which were to:

- Understand the relationships between infrastructure, development and the role of government. This was achieved in Chapter 3.
- Examine how infrastructure has been developed and operated through the ages and how this is currently organised. Chapter 4 considered this objective in some detail.
- Develop a view on good practices for infrastructure provision. In Chapter 5 a holistic system of infrastructure management was proposed from the research carried out in Chapters 3 and 4.
- Investigating the infrastructure system against an actual case study, which was the subject of Chapter 6.
- Making recommendations about what interventions governments in developing countries might consider in order to improve their management of infrastructure.

Before moving to recommendations to the governments of developing countries however, a number of conclusions surface from the research. These are articulated below.

### **7.2.1 Infrastructure is not a universally defined term**

It became evident in the early stages of writing this thesis that a working definition of infrastructure was needed because the term “infrastructure” is well recognised but less easily classified. After some examination, it was concluded that infrastructure involves capital goods that operate to provide services to society. Where the full cost can be recovered from end-users is called economic infrastructure. Infrastructure that provides

a public good that cannot be funded on a user pays basis is called social infrastructure. This definition neatly skirts around perceptions of who owns, develops, operates, and finances infrastructure, because these are not important to whether a capital asset is definably infrastructural.

### **7.2.2 Historically Governments have Played an Important but Mixed Role in Infrastructure**

Europe and the United States have been particularly influential regarding the manner in which infrastructure has been provided. Within Europe, the United Kingdom has driven trends, other than the French concession model developed in the mid nineteenth century that underpins many public-private relations in infrastructure today.

Before World War II, there was no fixed pattern of ownership of infrastructure assets and despite infrastructure being common perceived today as being “public”, much early infrastructure was actually initiated and developed by private interests. Governmental interventions were more reactionary, but became increasingly oriented around regulation so as to protect the public from overbearing private developers in the 1800s (Millward 2004, pp 4).

After World War II, there was a marked divergence between the United Kingdom and the United States in the approaches to infrastructure. Nationalisation dominated the landscape in the United Kingdom and, other than for a short period of heavy public involvement during the New Deal years, government interventions in infrastructure continued to be mostly regulatory.

The New Right thinking of the 1980s changed attitudes toward private involvement in infrastructure, and a wave of privatisations transferred much ownership from State to private hands. It is concluded though, that it was not this transfer that improved infrastructural services and instead it was the pre-sale industrial reforms that were most beneficial.

### **7.2.3 Structured Private Sector Involvement in Infrastructure is the Legacy of 20th Century Infrastructure Evolution**

Privatisation led to private participation in infrastructure and to the evolution of public private partnerships (PPPs) in infrastructure. It is these PPPs that are the enduring

legacy of developments in the infrastructure world last century (Broadbent and Laughlin 2003).

PPPs are a system for engaging with the private sector, rather than simply being a form of public-private joint venture. At the heart of the system is a decision point about whether the private sector has any role to play in a project at all.

The term ‘PPP’ is something of a misnomer and is better characterised as a social-commercial contract that meets the needs of societal and commercial interests.

In lower income countries, the development of higher income countries is instructive, but cannot be applied without taking local needs into account. Development institutions were initially slow to address the importance of public-private engagements and help transfer learning from donors to beneficiary countries (World Bank 2003, pp 2).

#### **7.2.4 Relationships between Government, Infrastructure, and Development are Strong**

The original research question posed in this thesis was “What is the role of government in setting an appropriate environment for public infrastructure development?” In addressing this question, a course has been charted through the role of the State in development, and it was concluded that there is an important role to play but one that is changing in the face of globalisation. The role of the State today is increasingly techno-economic in nature, and central governments are the natural members of international bodies that play an increasingly important part in a globalising world.

It is concluded that infrastructure has important dimensions from economic, social, and environmental viewpoints and that there is in general a positive correlation between infrastructure investment and welfare outcomes (ADB, 2005). It is not possible to be more precise than this, because the relationships between infrastructure investment and economic output are complex and have not yet been identified clearly.

On questions of sustainability, it was found that the external costs of human productions that are not priced into goods and services lead to higher consumption (Pigou 1954). The implications for infrastructure are two-fold. First, infrastructure decisions need to take into account their environmental impacts and these are imprecisely, but perhaps best measured through benefit-cost analysis that monetises these impacts. Second, infrastructure can help reduce underlying resource consumption and thereby not enhance the environment, but reduce the rate at which resources are depleted.



From a poverty alleviation viewpoint, infrastructure has an important role to play and it is concluded that the relationships between infrastructure and poverty reduction are strong. However, not all infrastructure investment is beneficial, and therefore it can be concluded that it is expeditious investment in infrastructure that matters most. Sometimes this can involve improved maintenance of existing assets, rather than through investing in new assets.

#### **7.2.5 Government has an important role to play as Planner, Procurer and Regulator of Infrastructure, but can often leave other Aspects to the Private Sector**

Government has an important role to play as the facilitator of infrastructure, but does not necessarily need to be involved in the inputs. To be at its most effective, government needs to establish an infrastructure management system that has a well-resourced secretariat that carries out a holistic National Infrastructure Plan. The plan should contemplate the upstream roles of government in: setting policy and enabling legislation, organising appropriate institutions to give effect to policy, planning projects, procuring a provider who will deliver the project, and regulating the end results.

The plan should take into account society's vision for itself, and this should guide demand for infrastructure. This "top down" approach should be melded with existing "bottom up" plans for specific infrastructure initiatives. These can be any type of activity that leads to better outcomes and need not be asset-based projects.

#### **7.2.6 An Infrastructure Management System for all Projects within a Country is Superior to Case by Case Project Development**

The examination of the Nam Theun 2 project supports a conclusion that the project preceded establishment of a system rather than the other way around. Much of the learning from the project can be built into the system retrospectively, but this is resource intensive, and human motivations are not geared to looking back.

Development partners have a major role to play in encouraging beneficiary client countries to develop a holistic infrastructure management system that is the vehicle for a total infrastructure cycle rather than simply being a project cycle.

These conclusions take us to a series of recommended principles that developing country governments would do well to adopt as policies, which underpin development of their own infrastructure management systems.

### 7.3 Recommendations

From the discussion in this thesis, it can be seen that there are a number of themes that emerge to guide policymakers wanting to adopt a holistic infrastructure management system. These involve:

- Setting ground rules appropriately because infrastructure relies on having effective public policies, institutions, legislation, and people.
- Choosing good projects, which means planning and selecting projects that are consistent with national goals, sector and corporate plans, and good planning criteria.
- Choosing good partners, which means approaching the procurement of project contractual parties professionally and appropriately for the type of contract being considered.
- Establishing procedures and sticking to them. An infrastructure management system that standardises the approach to existing and new infrastructure will lead to consistently better outcomes.
- Realising that most infrastructure is part of a system, so consideration of the whole system is needed when planning.
- Designing investment projects so they are sustainable economically, socially and environmentally, and have the lowest possible life cycle cost for the level of service provided.
- Maintaining existing infrastructure as this is just as important as investing in new infrastructure – all infrastructure service providers should have and be implementing an asset management plan.
- Maximising competition and regulating where necessary. Where natural monopolies exist, they should be well regulated and for everything else, competition should be maximised, but care should be taken over breaking up existing infrastructure providers.
- Having a commercial focus. Wherever possible, infrastructure services should be delivered through a commercial model that fully recovers the cost of operation, because society's resources are used most efficiently in this way. Subsidies for the overall service should only ever be used when the price of the service needed

to recover costs is greater than the “willingness to pay” for that service. This leaves government free to provide targeted subsidies to people in order to be equitable.

- Improving the supply of capital, since improving the investment climate will raise the number of financing options available and increase the likelihood of private sector participation in infrastructure.

Each of these elements should be guided by one central organisation that has the authority to cause each one to be realised within an overarching plan. The natural choice of such an organisation is central government, hence underpinning the important role that government plays toward ensuring good infrastructure outcomes for society.

# APPENDIX: INFORMATION SHEET



**Massey University**

COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

Development Studies  
School of People Environment and  
Planning  
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## ***The Role of Government in Setting an Appropriate Environment for Public Infrastructure Development***

### INFORMATION SHEET

#### **Researcher(s) Introduction**

Hello, my name is Richard MacGeorge and I am currently completing a Master of Philosophy in Development Studies at Massey University in New Zealand.

The title for my thesis is: "The Role of Government in Setting an Appropriate Environment for Public Infrastructure Development: A Case Study of Hydroelectric Schemes in Lao PDR".

It is to be an examination of how hydropower projects have been planned, procured and developed in Lao PDR as a means of giving some insights to the role of government in ensuring good project outcomes for society. I hope that the thesis will provide some helpful guidance on this subject that can be used by all stakeholders in a project.

Further details about the project are given below.

#### **Project Description and Invitation**

The effectiveness of infrastructure development in developing countries depends on the minimization of country risk. This in turn depends on governments being effective regarding the setting of policies, planning for and procuring targeted infrastructure outcomes. My thesis involves an analysis of the main causes of sub-optimal project outcomes due to governmental factors. These include policy setting, the legislation and public institutions that give effect to that policy, project planning, procurement and project monitoring. These are the public sector ingredients for success, which if not well managed will lead to ineffective social outcomes.

While the host country ends up being a major loser from project failure, I believe that appropriate intervention by governments is central to successful infrastructure delivery. On that note, I want to develop a deeper understanding of what governments can be doing so that their limited resources are allocated properly and not wasted.

I have identified you as being important to my research for the reasons outlined in my covering email or letter. Therefore I would very much welcome being in contact with you to gather information and understand my thesis topic better. Your involvement is entirely voluntary.

As we would be dealing with information that might be sensitive, I set out below how I intend to protect that information and you. If you would like more information from me that this information sheet does not cover, please email me at [richard.macgeorge@gmail.com](mailto:richard.macgeorge@gmail.com).

#### **Participant Identification and Recruitment**

In this section I describe how I have gone about identifying you and other potential participants, selection and exclusion criteria, the number of participants to be involved and the reason for this

number. I also describe the potential discomforts or risks to you and other participants as a result of participation and how I plan to minimize these.

My aim is to access voices from government, donors (such as the World Bank and the Asian Development Bank), and industry participants. With this in mind, I drew up a list of public stakeholders involved in the power sector in Lao PDR, power project developers, and other organizations and people that are important to the electricity sector in Lao PDR. Consequently, eighteen organizations have been identified to be important to my thesis and I have chosen eighteen individuals through my personal network, including you, to ask whether you would be willing to participate.

I intend to run an open-ended questionnaire each candidate who agrees to participate in my research. The questionnaire will be done online using a web based questionnaire application called Survey Gizmo. The questionnaire has around twenty questions and will take about fifteen minutes to complete. Some extra time might be needed by way of a telephone call or meeting if I have questions about your answers or need clarification on some things. The survey results will be aggregated and you will receive a copy of these, but it will not be possible to identify individual responses.

Regarding discomfort or risks to participants as a result of participation, I will ensure that the identities of participants are confidential at all times. Furthermore, no participant shall have their comments attributed to them or be capable of discovery. A list of participants will not appear in my thesis and the thesis will discuss themes that come from communicating with participants. The writing style of the thesis will be to identify areas that can be strengthened rather than highlighting and being critical of weaknesses. I trust that participants will be encouraged to engage openly with me about their observations of hydropower development in Lao PDR.

### **Project Procedures**

The process will simply involve me sending you an email to a link to the online survey form so that you can complete it from your office or anywhere else where you have an Internet connection. I will specify a period within which I would be grateful for the survey to be completed.

Regarding conflicts of interest, in my professional life I am an infrastructure financial advisor with experience in the electricity sector in Lao PDR. I have worked on a number of studies for the GOL and was its financial advisor for the Nam Theun 2 hydropower project for two years before its financial close. I am therefore associated with the power sector in Lao PDR and have an orientation to help support governmental agencies. That said, I have worked for private infrastructure investors for many years and understand that developers have legitimate needs that government must address before they will commit capital to developing a project. I do not believe I have any conflicts in carrying out this thesis, but do want to disclose my interests nonetheless.

### **Data Management**

Here I will discuss how I will use data, what happens to data when it is obtained, data storage and disposal, confidentiality and how you can access the summary of project findings.

Questionnaire data will be deleted from the Surveygizmo website as soon as possible. Surveygizmo is owned by Wdigix Software of the United States. Wdigix will proactively protect customer and subscriber data, and survey data by keeping its servers up-to-date and its internal data security high. Your data will never be exported, sold, rented, or used in any way by Wdigix Software, which acknowledges that the data is for my benefit to be protected to the very best of its abilities. Surveygizmo is also a member of the U.S Department of Commerce Safe Harbor initiative for the protection of data.

My notes and records relating to the data that I collect will be written using Microsoft Word and the files will be stored on my computer and backed up on an external hard disk drive. No further copies will be made and all data supporting my thesis will be deleted from my computer once the thesis is accepted.

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