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VALUE FOR MONEY IN INFRASTRUCTURE PROCUREMENT:

The costs and benefits of environmental and social safeguards in India

Foreword by Pradeep Singh,
Deputy Dean, Indian School of Business;
former Vice-Chairman and CEO, IDFC Projects Ltd., India

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VALUE FOR MONEY IN INFRASTRUCTURE PROCUREMENT:
The costs and benefits of environmental and social safeguards in India

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FOREWORD

Development of commercialized infrastructure projects in India remains an unpredictable asset class, despite huge demand and substantial improvements in related policies and practices and the accompanying institutional and legal arrangements. As public–private partnership arrangements become almost the default method of infrastructure procurement, uncertainties are greatest in the pre-concession phases.

Infrastructure development cannot, and must not, take place at the expense of the environment and livelihoods. And it is apparent that the structure, design, implementation and operation of infrastructure projects in India have to be improved to reduce their adverse environmental and social footprint considerably.

On the other hand, investors and developers are challenged by the uncertainties associated with the mandatory environmental and social safeguards and related processes required for concession agreements to enter into force. These burdens increase the already existing risks based on the assumption of demand, technology, financial and legal issues. The process for obtaining the necessary approvals is often lengthy, expensive and encumbered with administrative red tape and, at times, rent seeking. The resultant delay of bankable projects that are urgently needed across our country increases the risk profile of India as a transparent and viable investment location.

The irony is that the vast resources, time and energy targeted at social and environmental improvements are, in the end, squandered. Large amounts of time and money are currently deployed by both investors and government (and its agencies) to conduct the required assessments and to comply with the mandatory environmental and social safeguards without translating into meaningful improvements on the ground. The emphasis continues to be on the paper chase of pre-project approvals rather than on the subsequent implementation and enforcement.

The IISD study presented here deepens the discussion around these issues. The debate is most welcome, timely, and important. It discusses some of the complexities of the institutional arrangements related to the above-mentioned safeguards; it quantifies some of the environmental and social costs that arise when safeguards are poorly implemented and it makes recommendations on how these challenges can be addressed.

Further thinking and action along these lines is urgently required if infrastructure is to trigger the positive multipliers that stakeholders in India expect and deserve to see in the coming years. The prevalent mind set around infrastructure investment needs to take a longer-term perspective. The focus should be on service delivery as opposed to short-term asset balance sheets. The emphasis in the public sector needs to shift from administrative requirements—that may or may not bring value for money—to encourage innovation in the project configuration. IISD also advocates changes in the procurement process that can help deliver assets that are less energy- and resource-intensive and that will help develop green architectural and engineering skills in the Indian economy.

These are just some of the ideas that merit further debate, and I hope IISD will continue to engage with Indian stakeholders to move them forward. In developing this report, the authors have already made headway in engaging with a multitude of actors, bringing these issues to their attention. With the Government of India targeting US$1 trillion in infrastructure investments during 2012–2017, the moment to act is now.

Pradeep Singh

CEO and Deputy Dean, Indian School of Business
Former Vice-Chairman and CEO, IDFC Projects

ACRONYMS

ADB – Asian Development Bank
BOT – Build Own Transfer
BREEAM – Building Research Establishment Environmental Assessment Method
CA – Concession Agreement
CAG – Comptroller and Auditor General
CAMPA – Compensatory Afforestation Management and Planning Authority
CAPEX – Capital Expenditure
CAPM – Capital Asset Pricing Model
CBA – Cost Benefit Analysis
CCI – Cabinet Committee on Investment
CDM – Clean Development Mechanism
CEC – Central Empowered Committee
CGPL – Coastal Gujarat Power Ltd.
CSE – Centre for Science and Environment
CSO – Civil Society Organization
DBFM – Design Build Finance Maintain
DBFO – Design Build Finance Operate
DBFOM – Design Build Finance Operate Maintain
DBO – Design Build Operate
DEA – Department of Economic Affairs (MoF)
DPR – Detailed Project Report
EAC – Environmental Appraisal Committee
EHS – Environmental, Health and Safety
EHSS – Environmental, Health, Safety and Social
EIA – Environmental Impact Assessment
EMP – Environmental Management Plan
EOI – Expression of Interest
EPFI – Equator Principles Financial Institutions
FICCI – Federal Indian Chamber of Commerce & Industry
FSR – Feasibility Study Report
GEF – Global Environment Facility
GoI – Government of India
IAA – Impact Assessment Authority
ICB – International Competitive Bidding
IDF – Infrastructure Debt Fund
IDFC – Infrastructure Development Finance Corp.
IFC – International Finance Corporation
IIFCL – India Infrastructure Finance Corp. Ltd.
IISD – International Institute for Sustainable Development
ISCA – Infrastructure Sustainability Council of Australia
ISR – Initial Screening Report
KUA – Kishangarh Udaipur Ahmedabad
LARR – Land Acquisition and Rehabilitation and Resettlement
LCA – Life Cycle Assessment
LCB – Limited Competitive Bidding
LDO – Lease Develop Operate
LEED – Leadership in Energy & Environmental Design
MoEF – Ministry of Environment and Forests
MoF – Ministry of Finance
NBFC – Non-Bank Finance Companies
NBWL – National Board for Wildlife
NCB – National Competitive Bidding
NCC – Nagarjuna Construction Company
NGO – Non- Governmental Organization
NGT – National Green Tribunal
NHA – National Highways Act
NHAI – National Highways Authority of India
NPV – Net Present Value
PES – Payments for Ecosystem Services
PFI – Private Finance Initiative
PPP – Public Private Partnership
PPPAC – PPP Appraisal Committee
PRU – Performance Review Unit
QCBS – Quality-cum-Cost-Based Selection
RFP – Request for Proposal
RFQ – Request for Qualification
RTI – Right to Information (Act)
RTP – Request for Technical Proposals
SEA – Strategic Environmental Assessment
SEAC – State Environmental Appraisal Committee
SEIA – Strategic Environmental Impact Assessment
SEZ – Special Economic Zone
SIA – Social Impact Assessment
SPCB – State Pollution Control Board
ToR – Terms of Reference
UMPP – Ultra Mega Power Projects
UNDP – United Nations Development Program
UNIDO – United Nations Industrial Development Org.
UTPCC – Union Territory Pollution Control Committee
VfM – Value for Money
VGF – Viability Gap Funding
WCS – Wildlife Conservation Society
WWF – World Wildlife Fund

EXECUTIVE SUMMARY

This report debates the extent to which public–private partnerships (PPPs) are delivering value for money in India. While value for money (VfM) is traditionally interpreted to mean the lowest price alternative at the time of commissioning, in the context of sustainable development it is understood as value for money across the asset life-cycle. This approach embodies the principles of "total cost of ownership" and "whole-life value"—accounting for the costs of planning, designing, building, operating and maintaining an asset. It can therefore be used to account for medium- and longer-term efficiency gains and cost reductions enabled by sustainable infrastructure. This is crucial, if India is to use infrastructure development as an engine for green growth.

Our findings indicate that, despite the best-in-class laws, policies, formal processes and institutional frameworks, PPPs in India might not be delivering VfM across asset life cycles. Our findings are based on the assessment of four central safeguards that are mandatory requirements in the approval process for PPPs in India. These safeguards are: the Environmental Clearance, the Forest Clearance, the Wildlife Clearance, and the land acquisition and resettlement safeguards. The analysis also provides an indication of the costs of poorly implementing these safeguards—costs which are ultimately borne by the public. The analysis also provides estimates of the potential gains that can be afforded to both the public and private sector if environmental and social criteria were built into the preliminary request for proposals and tender specifications.

We also find that VfM is being diminished due to a number of factors ranging from poor data quality and poor technical capacities that mar the accuracy of the safeguard requirements, to administrative red tape that can cause lengthy and expensive delays both before and during construction. More fundamentally, VfM is lowered due to a lack of appreciation by PPP stakeholders of the financial gains that can be realized if safeguard requirements were better implemented and environmental and social criteria was built into request for proposals and technical specifications.

Strategies to address these challenges are discussed in the final chapter on recommendations. Implementing these strategies also requires that project finance risk premiums are calculated with the insight that environmental and social performance can substantially reduce almost all areas of financial risk. As such, environmental and social performance can increase the net present value, lower the cost of capital and yield more sustainable infrastructure. However, under current market conditions in most parts of the world, including India, sustainable infrastructure is still in its infancy and will inevitably lead to calls for higher capital expenditure, even though the incremental capital expenditure may be recovered during the construction and operation of the asset. To address this challenge, we also make recommendations on how existing financing vehicles and instruments can be tweaked to lower the cost of capital for sustainable infrastructure.

A major challenge in this project was gaining access to relevant data. This included project-level documentation on the recommendations from, and implementation of, safeguards, as well as the concession agreements of the power and highway projects that were used as case studies. Despite our best efforts through phone calls, interviews, letters, and working with IISD's partners and friends in India, we had limited success in accessing these documents. This posed significant challenges to the research, especially as all the documents we were seeking were, by law, required to be available in the public domain. A request has been filed under the Right to Information Act (RTI) procedure, and, at time of printing, we are yet awaiting a response. The analysis in this report is based on secondary data and on the findings from several weeks of stakeholder consultations in India.

This report is organized as follows:

- **Section I** establishes the case for value for money through PPPs, across their life cycles.
- **Section II** distills the formal PPP approval process in India and provides an overview of the principal institutions involved in PPP governance in India.
- **Section III** presents the four environmental and social safeguards, describing their origins, their procedural requirements and offering a critical analysis of their efficacy in delivering VfM. These safeguards are the Environmental Clearance, the Forest Clearance, the land acquisition and resettlement safeguards, and the Wildlife Clearance.
- **Section IV** provides a quantitative analysis of the environmental and social costs of not implementing environmental and social safeguards. The analysis is based on four ongoing PPP projects in India.

- **Section V** describes the safeguards policies of selected international financial institutions— the World Bank, Asian Development Bank, the International Finance Corporation—as well as the Equator Principles, all of these being relevant also in the Indian context.
- **Section VI** describes how environmental and social performance can help reduce risks across almost all categories of financial risk. As such, this chapter also discusses why the Capital Asset Pricing Model is not the best tool to value and discount the longer-terms gains afforded by sustainable infrastructure.
- **Section VII** provides an overview of sustainability standards from various domains relevant to Indian infrastructure that can be drawn on to incorporate environmental and social performance requirements in RfPs and other tender documentation.
- **Section VIII** makes recommendations on practical strategies to increase value for money across PPP life cycles, covering financing, deal structuring, procuring, constructing, and operating.

METHODOLOGY

This project was developed using primary and secondary research conducted in India and internationally.

The project team held extensive consultations with policy-makers, investors and non-governmental organizations in India as well as in other mature PPP markets including the United Kingdom, Australia, the Netherlands, Sweden, South Africa, Canada and the United States. Formal interviews were also held with multilateral development banks in India and their offices in the United States, Tunisia, Thailand and the Philippines. Extensive consultations were also held with the Infrastructure Development Finance Corporation, which facilitated this project.

The report is partly based on qualitative and quantitative data, including the mandatory environmental and social safeguards in India and their relation to four specific case study projects; the extent to which the safeguards are being implemented; and the environmental impacts and monetary costs pf process delays and poor implementation. All data sets were obtained from public domain sources and have been referenced accordingly. Data sourcing was the most challenging aspect of this project. Even though all the required information is stipulated under Indian law to be publicly disclosed, we were neither able to gain access to these records on the websites of the relevant public authorities, nor obtain hard copies through our interviews and interactions with the relevant public officials. A request has been filed under the Right to Information Act (RTI) procedure, and, at time of printing, we are still awaiting a response.

Give the challenges in accessing project level data, the environmental costs and related monetary values have been calculated based on a) proxies from other infrastructure projects in India and other countries, and b) global estimates derived for Payment for Ecosystem Services—the globally accepted methodology to assess the terms of payment to land managers, citizens and the public sector to undertake actions to safeguard the environment and its natural ecological cycles.

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Value for Money through PPPs

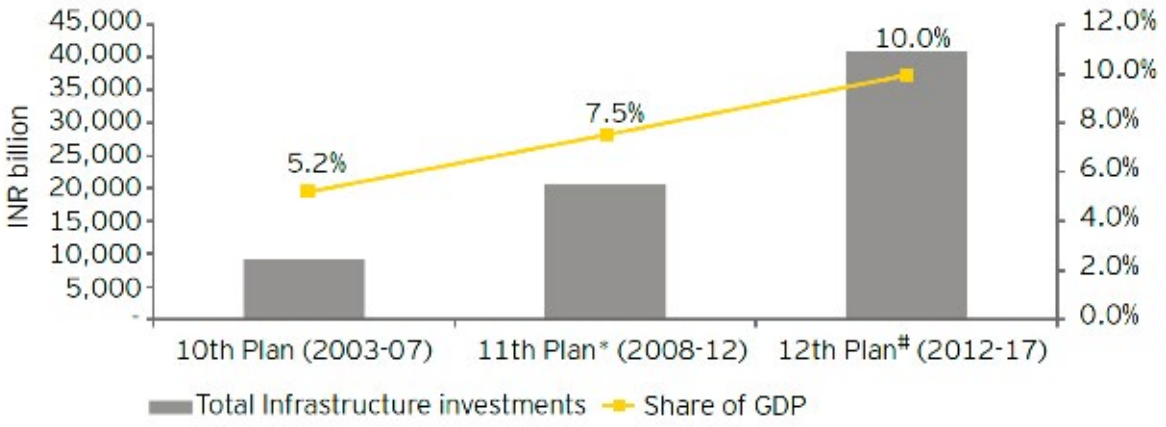
SECTION I – VALUE FOR MONEY THROUGH PPPS

PPPs are essentially "risk sharing partnerships" between governments and the private sector on financing, designing, constructing and operating public infrastructure and public services. Infrastructure projects are inherently complex and unpredictable, and, under PPP arrangements, governments opt to transfer specific tasks and the risks associated with them to private enterprises that might be better able to execute and mitigate them. The delivery and operating efficiency of public assets thus offer improved and better value for money (VfM) for the public purse. The key characteristic of PPPs is therefore the transfer of risk to the private sector that is tied up in long-term financing and contractual arrangements that frequently last 20 to 30 years.

PUBLIC–PRIVATE PARTNERSHIPS

PPPs are used by governments to contract the private sector to finance, design, build, operate and maintain public infrastructure, on budget and on time. Governments retain the responsibility to make these assets and services available to the public in a manner that supports sustainable development.

PPPs are becoming the default method of infrastructure procurement, and the government of India is a forerunner in the emerging world. It boasts a vibrant PPP market; as of July 2013, the PPP Database of the Department of Economic Affairs, Ministry of Finance, indicated that 758 PPP projects with a total value of INR 3,833 billion (approximately US$62 billion) were in the operational and construction stages.[1] The government of India has also set itself an impressive goal for doubling infrastructure investment during the 12th Five-Year Plan period, 2012–2017. This is projected to be equivalent of over 10 per cent of GDP as shown in Figure 1 below. With such extraordinary targets, the PPP method needs to be positioned as a motor for economically, socially and environmentally sustainable development in the coming years.



* Figure are based on estimation done in 2008-09; # Projected
Source: Mid-term appraisal of Eleventh Five Year Plan and infrastructure funding requirements and its sources over the implementation period of the Twelfth Five Year Plan, Planning Commission.

FIGURE 1 INFRASTRUCTURE INVESTMENT IN INDIA

Source: Ernst & Young Pvt. Ltd & Federal Indian Chamber of Commerce and Industry, 2012.

The investment planned under the 12th Five-Year Plan is shown in Figure 2 below, broken down by infrastructure sectors.

[1] See http://www.pppindiadatabase.com.

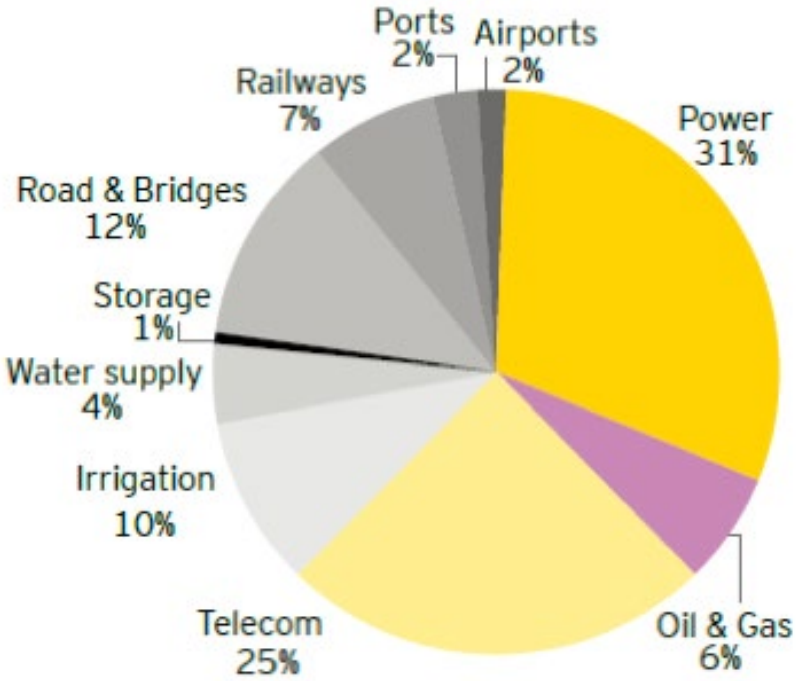


FIGURE 2 SECTORIAL INVESTMENT PLANNED IN THE 12TH FIVE-YEAR PLAN

Source: 12th Five-Year Plan approach paper and Planning Commission as cited in Ernst & Young Pvt. Ltd & Federal Indian Chamber of Commerce and Industry, 2012

Types of PPP arrangements

Global practice on PPP emerges in two major forms:

1. **Concessions agreements** under which public assets are tendered out to private enterprises that are mandated to finance, design, build, and operate them, or execute some of these functions, for a given period of time. They are mainly financed by user fees and are hence used in the delivery of power, water, public transport, toll roads and the like.
2. **Private Finance Initiatives**, by which public services are financed, designed, built and operated by the private sector but are paid for by the commissioning public authority. PFIs are hence used to deliver on "social infrastructure" such as schools, hospitals, public lighting, etc. The capital for the payment of the PFI services is allocated by central government in the form of "PFI credits." This model has been adopted in the EU and United States and is very much a part of the emerging landscape on PPPs.

Delivering value for money through PPPs

VfM is integral to why PPPs are becoming the preferred method for infrastructure procurement all over the world. **Because PPPs enable governments to allocate various functions and risks associated with the development of infrastructure to private enterprises that are traditionally better able to assume them, public assets can be, at least in theory, better delivered on time, on budget and be operated more efficiently**. This increases VfM of PPP arrangements as governments do not to have the capacity to assume all functions and risk themselves. Most governments do not have the financing, engineering and management skills for delivering complex infrastructure, and PPPs enable some of these functions to be performed by private enterprises that have the required knowledge and skills.

Infrastructure projects also involve a large number of risks, including legal and political risks, demand-side risks related to revenues being lower than projected, construction-time overrun risks, supply-side risks related to raw materials not being delivered on time and to quality, technology risks, *force majeure* and others. Governments have been constantly challenged to address all these risks and deliver on infrastructure that yields VfM. PPPs provide a potential solution to this dilemma for they allow governments to take

on the risks that the public sector can effectively assume— financial, legal and political—and contract private enterprises to assume others that the government cannot efficiently take on, such as financing, designing and operating. The arrangements are flexible, and governments can use a variety of PPP models to suit their domestic capacities, development priorities and macroeconomic conditions. The main types of PPPs are depicted in Figure 3 below.

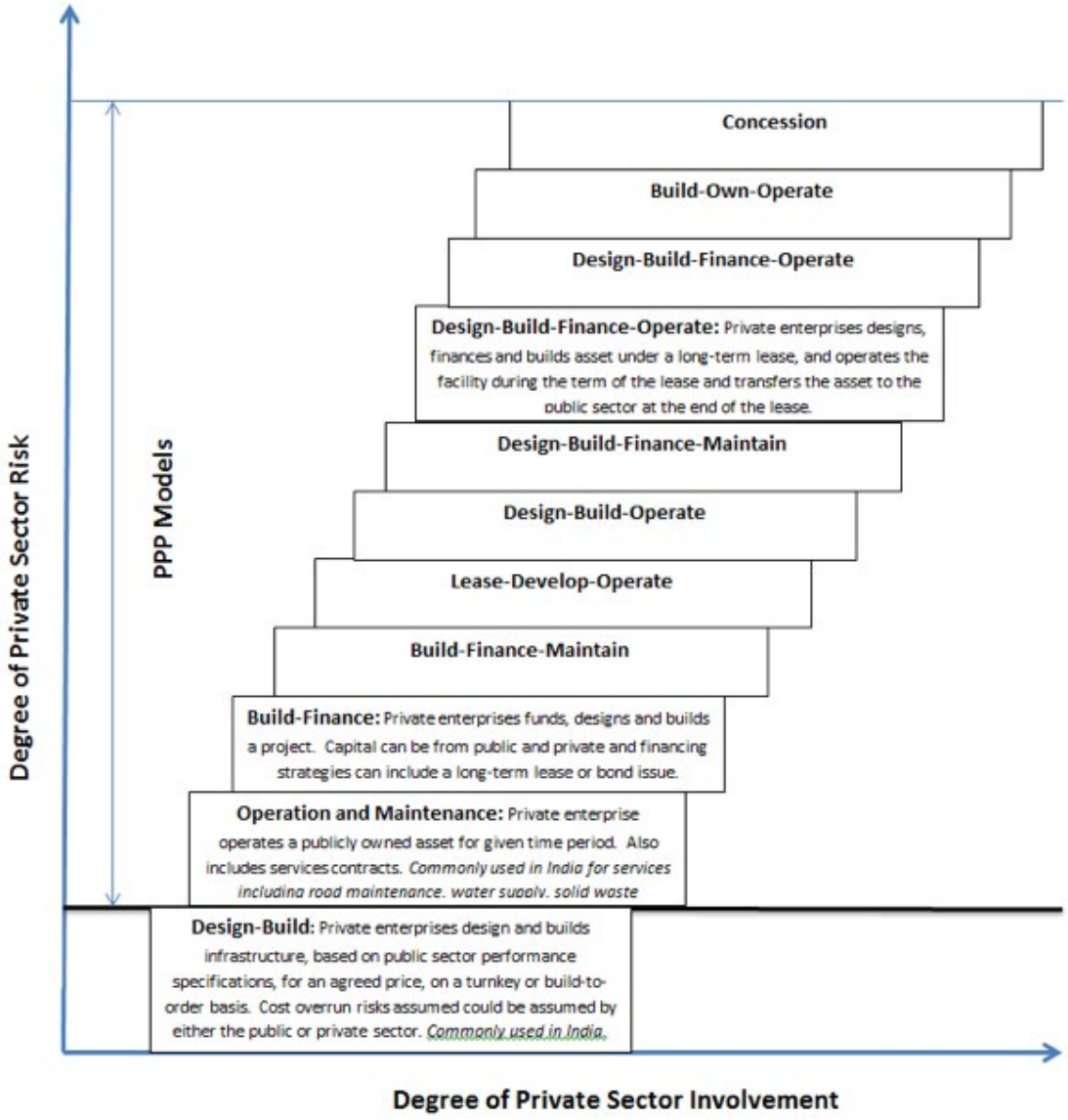


FIGURE 3 TYPES OF PPP MODELS

Source: Author diagram, based on United Nations Economic Commission for Europe, 2008.

VfM is a method to assess if a public entity is receiving the maximum benefit from the goods and services it procures with the resources available to it, in order to provide public services. **In the context of sustainable development, IISD interprets VfM in line with whole-life-cost or the total cost of ownership—i.e., the cost of an asset not simply at the point of purchase but across its design and raw material sourcing, construction, operation and end-of-life decommissioning**. As such, VfM takes into account not only the financial feasibility of an asset, but also its material and energy intensity, fitness for purpose, durability, its social multipliers such as job creation and skills building and a host of other features that, when taken together, constitute good value.

In practice however, since 2008 PPPs in many industrialized countries have proven disappointing. Governments found themselves locked into long-term contracts and having to pay out guarantees on cost overruns, use volumes, user fees and annuity payments at a time when public budgets were under stress. Public discontent with what appeared to be publicly funded profits for private investors hit both headlines and picket lines. This was followed by a raft of reforms, commissioned to make PPP arrangements more flexible and equitable for all concerned. We can certainly conclude that VfM in these cases was seriously compromised.

VfM across the life cycle also implies that its assessment should include a mix of both qualitative and quantitative methods and benchmarking with other organizations and projects of the same asset class. This in turn hinges on "informed government" because it is critical to have high-quality information to make public decisions and monitor performance.

In the case of India, the Department for Economic Affairs (DEA) of the Ministry of Finance has taken notable steps to incorporate VfM into the PPP-approval process. VfM is integrated into requirements on the pre-tender Feasibility Studies, the formal Request for Proposals (RFP) and bid evaluation. The DEA has also published a sector-specific PPP VfM Tool which is based on the traditional project finance feasibility parameters, including operational-phase risks (revenues and volumes), construction-phase risks (overruns in cost and time) and contract-renegotiation risks. These are commendable steps in the direction of sustainable PPPs and sustainable development.

The government of India also seeks to increase VfM through the mandatory requirements on environmental and social safeguards. In this project we focus on four of these safeguards—the Environmental Clearance, Forest Clearance, Wildlife Clearance, and compensation for land acquisition (as in the current laws and the upcoming Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2012). These safeguards have all been designed to minimize the negative environmental and social impacts of infrastructure projects. At least in theory, the recommendations generated through these clearances should be integrated into decisions pertaining to the siting, design financing and technical specifications of the project. Environmental, social and economic externalities and their related risks are then to be built into the project, which would lead to increased VfM across the project life cycle.

However, anecdotal evidence from the India infrastructure market suggests that despite best-in-class legal and institutional frameworks, the goals of these safeguards are not realized:

- **Investors believe that the above-mentioned environmental and social safeguards are causing unacceptable and expensive delays and involve additional red tape and rent seeking**. This impacts the broader investment climate and increases the legal and political risks associated with infrastructure projects. As of May 2012, over 42 per cent of the 564 infrastructure projects in India, with a total cost of more than INR 1,027 billion (approximately US$16.6 billion), were delayed (Ernst & Young Pvt. Ltd & Federal Indian Chamber of Commerce and Industry, 2012). This has resulted in an average escalation of project development cost by 16.9 per cent, amounting to an incremental cost of INR 1.5 billion (Ernst & Young Pvt. Ltd & Federal Indian Chamber of Commerce and Industry, 2012). While it is true that such delays may help tide over investment shortfalls, the related losses are too significant to be ignored.
- **Investors also see limited value in environmental and social safeguard**s, which suggests that the safeguards in turn do not have the necessary and positive influence over the siting, design, financing and technical specifications of the project.
- **NGOs criticize the fact that the much-needed infrastructure in India is being deployed with little regard for environmental and social sustainability**. They also question the technical capacities of the third-party groups that conduct the feasibility studies and the quality of the background data on which safeguard recommendations are based. Civil society continues to be a powerful and critical voice in the PPP debate and has helped increase transparency, accountability and public participation in the PPP debate in an unprecedented manner.
- **Regulators complain of limitations in head count, budgets and technical expertise and that non-compliance related fines and penalties are not high enough to be meaningful**. Regulators may also lack the incentives to ensure adequate due diligence across the PPP life- cycle.

Deal structuring in the PPP domain is complex and expensive. Infrastructure projects can take three to five years to put together at a cost of anywhere between 3 per cent to 10 per cent of the total project budget. **The Government of India has rightly established several funds to help ease the transaction costs: the Viability Gap Fund, the Project Development Fund, the Infrastructure Debt Fund, and, more recently, the Take Out Finance Scheme aimed at commercial banks to help them address their asset liability mismatch**.

All these are indicators that infrastructure development is a key priority in India, and VfM lies at the core of this policy landscape. However, if India is to realize equitable and sustainable development, **VfM goals need to be broadened to integrate environmental, social and wider economic externalities. For it is the public that otherwise meets the costs of such negative externalities**. To some extent the costs will be incurred by another public budget or other entity's cost centre. For example, if infrastructure projects discharge toxic effluents into public waterways, the resulting costs of cleanup and adverse human health are borne by the public sector. As such, these externalities impact the VfM for the Government of India as a whole and corrective measures need to begin at source—in line with the polluter-pays principle—at the design, siting, financing and implementation stages of the PPP.

This report explores this multi-faceted debate and makes the case for the integration of both positive and negative environmental, social and wider economic externalities into the VfM equation. PPPs should not only be planned as a motor for efficient infrastructure and public services, but also as a catalyst for sustainable and equitable development across India.

SECTION II

The PPP Approval Process and Institutional Framework for PPPs in India

SECTION II – THE PPP APPROVAL PROCESS AND INSTITUTIONAL FRAMEWORK FOR PPPS IN INDIA

1. THE PPP APPROVAL PROCESS

This section draws on a number of authoritative sources to provide a generic mapping of the PPP process from the perspectives of both the public and private sector for large national-level projects.[2] Thereby this section maps the PPP process as it is formally constructed. In practice, the process frequently differs from this, partly because the referenced documents are still in "draft" form. Throughout the following sections, the term "contracting authority" refers to the public sector project proponent, also known as the "sponsoring authority," or simply "sponsor."

The Department of Economic Affairs of the Ministry of Finance—the entity where the Indian PPP cell is located—divides the PPP process into four phases, as shown in the figure below.

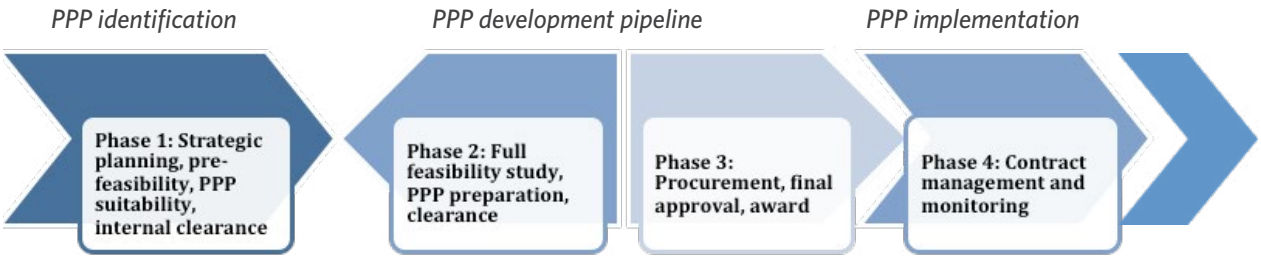


FIGURE 4 OVERVIEW OF MAIN PHASES IN THE PPP PROCESS

Source: Prepared by the authors based on Dept. of Economic Affairs, 2010a.

Phase 1 takes place before projects enter the development pipeline and covers PPP identification and needs analysis, strategic planning, project pre-feasibility analysis, PPP suitability checks, and internal clearance to proceed with PPP development. The main objective in this phase is to ensure a quality pipeline of PPPs. This is crucial to pursuing VfM across the PPP process, ensuring that resources are dedicated to PPP projects with a high probability of success.

Phase 2 marks the beginning of the PPP development pipeline and includes the full feasibility study, PPP preparation and in-principle project clearance. In this phase, potential PPPs projects are developed in detail and assessed for their suitability for development as PPPs. Projects deemed suitable are examined in depth, and an application is made to external authorities in order to gain clearance to proceed to the procurement stage.

Phase 3 is the continuation of the PPP development pipeline in which procurement takes place, including finalization of bidding documents, final approval and project award. Projects are "potential" until they have passed the final approval. In this phase negotiations between the project sponsor and the preferred bidder take place and, if successful, the project is taken to technical and financial close, including the signing of the concession agreement.

Phase 4 extends over the rest of the PPP project's life and covers project implementation, including construction and operation (as applicable) monitoring that parties meet their contractual obligations, contract management, including amendments, and, potentially, dispute resolution.

The public sector has multiples role throughout the PPP process (Planning Commission, 2009a, p. 9). The contracting authority proactively pushes the development of the project; the Ministry of Finance decides on the level of direct and indirect Central Government exposure and can also act as an arbiter; and the Planning Commission focuses on due diligence, coherence across sectors and promotion of PPP best practice.

A detailed overview of the four-phase process is provided in Figure 5 on the next page. It covers all the steps described subsequently in this section.

[2] This section draws mainly on the following sources: Dept. of Economic Affairs (2010a, 2011, 2012) and Planning Commission (2009a). Other sources are indicated where relevant.

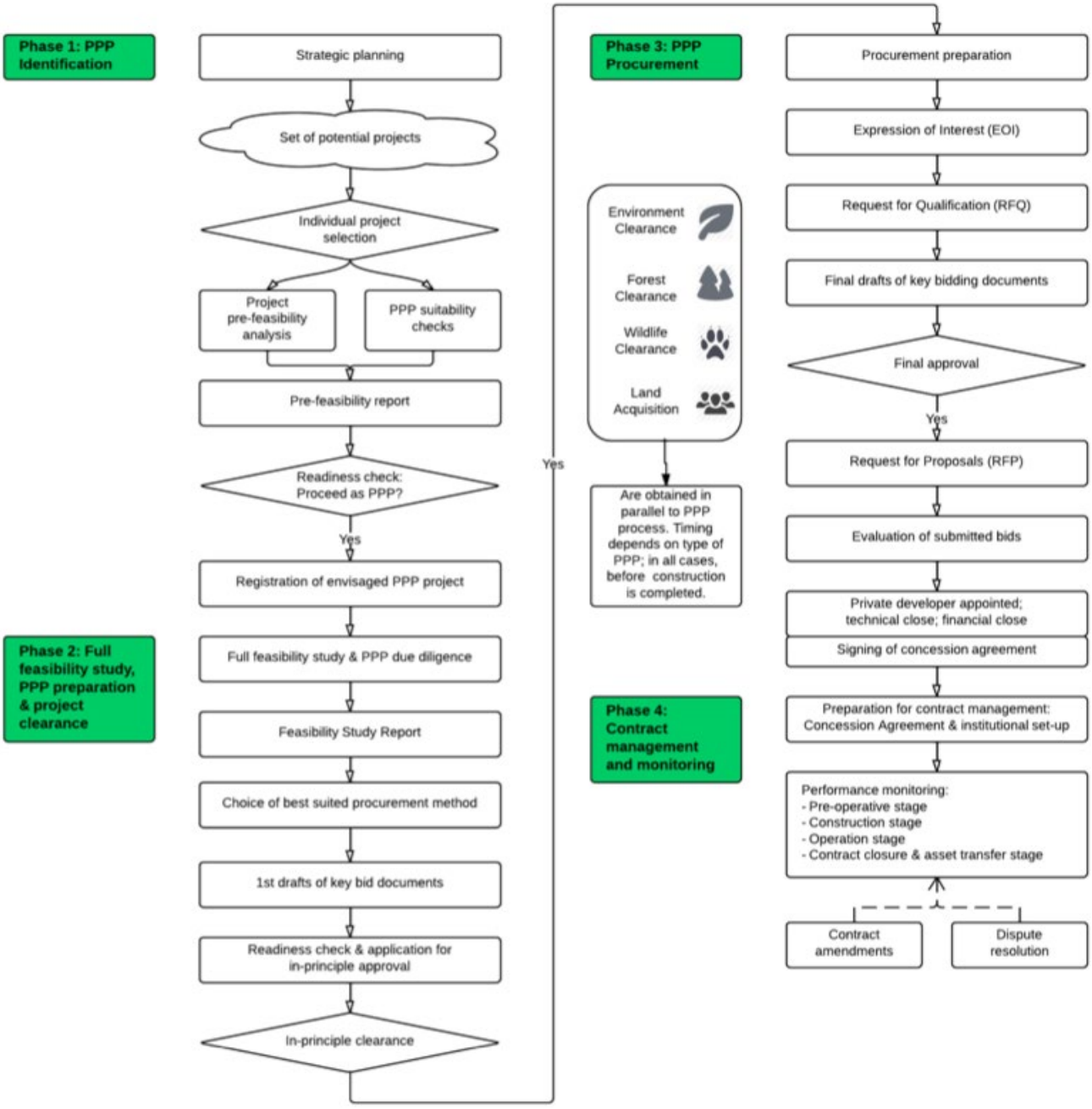


FIGURE 5. THE GENERIC PPP PROCESS IN INDIA

Sources: Prepared by the authors based on Department of Economic Affairs 2010a, 2011, 2012; and Planning Commission, 2009a.

Phase 1: PPP Identification

In Phase 1, infrastructure service needs are ascertained and quality projects that would meet these needs and likely be successfully developed as PPPs are identified and tested. Projects that make it through this phase enter the PPP development pipeline in Phase 2.

Responsibility in this phase lies with the contracting authority, such as the National Highways Authority of India (NHAI) for national highways, a national ministry for Central-level projects, an urban authority, or a public sector corporation. Support to the authority can be provided by PPP agencies, including the PPP Cell and external consultants.

This stage begins with **strategic planning** for a set of projects. The public authority responsible for the planning of a certain type of infrastructure may undertake the strategic planning itself or hire specialist advisors in order to:

- **Produce a preliminary needs assessment study** that will identify infrastructure service needs by user groups. These can then be broken down into individual project interventions.
- **Assess existing and planned service capability**. Existing assets should be assessed for their ability to meet current and expected future service needs.
- **Identify projects to meet service needs**. The difference between needs and previously assessed needs and the existing and planned service capability is used to identify infrastructure requirements with different time horizons. These requirements, in turn, provide the basis for the identification of project interventions. Project interventions are planned activities intended to meet a service need. The various identified projects are then prioritized in order to sequence them in the strategic plan. Prioritization is done through a preliminary cost-benefit analysis (CBA) of each project. A thorough assessment for each such project is undertaken in subsequent stages below.

In undertaking the CBA, the Department of Economic Affairs writes that (Dept. of Economic Affairs, 2010b):

The assessment of project benefits should take account of impacts beyond those directly relating to the project itself and those who use its services. For example, in network infrastructure there can be spillover effects from a single project that create benefits for the network as a whole. These effects feed back into the benefit-cost ratio for the project to give it a higher priority. Indirect impacts also include impacts on the wider economy.

The above leads to a strategic plan that includes a prioritized **set of potential projects** that a competent authority might want to pursue for infrastructure development in a certain sector.

From this set, an **individual project is selected** for further assessment. This is the stage where the PPP process for individual projects starts.

The **project pre-feasibility analysis** aims to ascertain whether the project is feasible. This analysis is not as comprehensive as a full feasibility study (undertaken in Phase 2, should the project get there) but should allow the authority to determine whether to proceed further. This stage covers preliminary analysis of:

- **Needs:** The needs analysis builds on the analysis during the strategic planning stage above and should focus on the services required by end users.
- **Options:** The delivery options for meeting the identified needs are laid out and can include non-asset solutions (e.g., changed management practices), improvement of existing assets, new assets.
- **Legal feasibility:** Is the proposed project legally feasible?
- **Technical feasibility:** Including the engineering and technical aspects of the project, the manageability of the operational aspects of the project, and a preliminary assessment of all likely technical and operational risks.
- **Scoping social/environment safeguards analysis**
- **Preliminary financial viability** including expectations of required government financial support: This includes basic financial aspects including: cost recovery/income generation assumptions of the project; likely private sector interest in the project; overall project cost (capital and O&M); possible financial risks; and the likely economic benefits generated by the project

- **Institutional capability analysis**
- **Identification** of next steps required

The Department of Economic Affairs provides tools to support the work listed above, including a template for needs and options analysis, environmental safeguards checklists and a Financial Viability Indicator tool.

PPP suitability checks are undertaken to assess whether the project under consideration is suited for implementation as a PPP. The objective in undertaking this step in Phase 1 is to eliminate unsuitable projects early on. The PPP suitability analysis examines whether the project's context meets certain requirements, including legal, institutional and market capacity.

To this end, various tools are provided by the Dept. of Economic Affairs: the PPP family decision tree, the PPP mode validation tool and, in particular, the Suitability Filter. If a project does not pass the filter, it should be redesigned or procured through a non-PPP procurement mode.

The above pre-feasibility and PPP suitability analyses are summarized in a pre-feasibility report, also known as an Initial Screening Report (ISR).

In a **Readiness Check**, the pre-feasibility report is used to obtain internal clearance from the contracting authority's internal review committee and thereby proceed to the next phase of the PPP process. To this end the report covers:

- **Support for the project:** The need for the project, options considered and a justification of the proposed option
- **Preliminary project feasibility:** preliminary legal, technical, and social/environmental feasibility, estimates of financial viability including expectations of required government financial support, and institutional capability analysis
- **Support for procurement as a PPP:** Assessment of PPP suitability; description of envisaged PPP mode and public and private sector roles
- Next steps and issues to be tackled.

If the readiness check result is favorable, the project moves onto Phase 2.

The contracting authority is obliged to **register the potential PPP project** with the PPP Appraisal Committee (PPPAC) Secretariat at the Department of Economic Affairs, including the pre-feasibility report. This has to be done no later than two weeks before the issue of the RFQ. The details of the PPP feed into the official database of PPP projects, to be updated throughout the PPP's project cycle.

Phase 2: Full feasibility study, PPP preparation and project clearance

With Phase 2 the PPP development pipeline begins in which multiple PPPs are included that have passed Phase 1. In this phase, a detailed study of the project's feasibility is conducted to prepare the PPP for procurement and obtain In-principle Clearance to proceed to Phase 3—procurement. Whether projects will actually be realized as PPPs is only determined at the end of Phase 3.

Responsibility for Phase 2 lies with the Sponsoring Authority—e.g., a ministry for central-level projects, a sponsoring department, or statutory or public sector corporate entity. Support to the project development can be provided by the Dept. of Economic Affairs' PPP Cell or a Project Development Agency.

This phase begins with the **full feasibility study and PPP due diligence:** these are the core parts of this phase of the PPP process. Building on the Pre-Feasibility Report, the aim of the feasibility study is to investigate in detail whether the project is desirable, viable and achievable by analyzing project costs, benefits and risks. It covers technical, social, environmental, legal, financial, economic and risk characteristics of the PPP project. It also includes a project implementation schedule and stipulates the particular PPP type to be employed. The specific issues covered in the study will depend on the type of PPP being analyzed; a capital expenditure project will, for instance, require more extensive analysis, due to its capital intensity.

A PPP due diligence analysis is part of the full feasibility study in order to ensure that the project is well developed and planned as a PPP. This concerns, in particular:

- Risk analysis and allocation, contributing to the choice of the specific PPP mode.
- Financial viability, including the essential financial assessments of the selected PPP mode and of the conditions under which the project can be financially successful.
- Value-for-money analysis, using quantitative evidence if available.
- Verification that the project has been well prepared through the PPP development process and is ready for the in-principle clearance process.

The Department for Economic affairs also provides a series of tools to assist in the above due diligence, including a value for money tool.

A **Feasibility Study Report** (FSR) is the output from the above full feasibility study. The FSR makes the business case for the PPP project and supports the application for its in-principle clearance at the end of Phase 2 to proceed to the procurement phase. It must contain all the information that the approving authority needs to make its decision. A Detailed Project Report (DPR) is a variant of an FSR.

The contents of the FSR are similar to the pre-feasibility report of Phase 1 above but much more detailed, covering the following:

- **Support and justification for the project**—Results of the feasibility study that provide justification for the investment:
  - Need for the project, identifying gaps in the market that would be filled by the project, policy objectives met by the project, alternatives considered.
  - Description of the project, including: definition of services/outputs it would provide, location, target user group, technologies to be employed, agencies involved and their responsibilities, project timeline, etc.
  - Social and environmental impact studies and planned mitigation measures.
  - Technical description of infrastructure additions required for the project.
  - Costs and benefits of the project and their distribution among key stakeholders, including social and environmental impacts.
  - Summary of the financial viability of the project.
  - Summary of economic appraisal (cost/benefit analysis).
  - Project implementation schedule.
- **Support for procuring the project as a PPP**—In addition to the general project feasibility results, the FSR should include results of the specific PPP due diligence analysis:
  - Identification of major project risks and their allocation between the public and private partners.
  - Type of PPP proposed including description of likely finance structure.
  - Requirement for government assistance to the project (e.g., viability gap funding, or VGF).

- Value-for-money analysis and result.
- Other due diligence assessments (legal, market sounding).
- Capacity of sponsor to implement the PPP, plan for implementation and PPP management including capacity building and use of advisors, plan for meeting project development costs.

- **A section summarizing the justification for the PPP project**
  - Besides being the basis on which the application for in-principle clearance is granted, the FSR also informs key project documents, including the RFP. It also assists the evaluation of bids subsequently and enable the public sector sponsor to "negotiate and sign a PPP contract with confidence" (Department of Economic Affairs, 2010d).

At this stage the contracting authority makes a **choice of the most suitable procurement method**, according to the PPP project's characteristics. The Department of Economic Affairs recognizes that open, competitive bidding is "generally accepted best practice" for procuring PPP projects as it encourages innovation and efficiency (Department of Economic Affairs, n.d.). The three possible competitive methods are:

- International Competitive Bidding (ICB)
- National Competitive Bidding (NCB)
- Limited Competitive Bidding (International and Domestic).

Beyond the bidding strategy, the contracting authority also chooses the basis for bid evaluation. The usual options are Quality-cum-Cost-Based Selection (QCBS), Quality Based Selection, and Least Cost Method. QCBS is typically preferred in ICB.

Finally, the authority sets either a single-stage or a multistage type of procurement process. The former only includes a Request for Proposals (RFP), while the latter can have an Expression of Interest (EOI) and/or Request for Qualification (RFQ) stage, followed by a Request for Technical Proposals (RTP) (only for exceptionally complex projects), followed by the Request for Proposals (RFP) stage in which the technical and financial proposals are solicited. The Indian Ministry of Finance states that two-stage, competitive tendering is the preferred mode of procurement for central sector PPP projects, "save in situations where exceptions have been provided under the Rules" (Department of Economic Affairs, 2012, p. 12). This means that for most central sector projects there are in practice only two stages: the RFQ and the RFP.

The **first drafts of key bid documents** are prepared by the contracting authority. These typically include a draft concession agreement, and drafts of the first-stage bid documents, i.e., the EOI and/or RFQ depending on the type of procurement process chosen. These documents are informed by the feasibility study above and for the basis for the In-principle Clearance decision by the contracting authority. Model concession agreements and other documents have been prepared by the Ministry of Finance to streamline the process through a standard risk-allocation framework and to benefit from previous experience and best practice.

A readiness check and the application for in-principle approval are undertaken at the end of Phase 2. Procedures vary according to the jurisdiction at which the PPP project is being proposed. At the central level, an application for clearance is submitted to the PPP Cell at the Department of Economic Affairs which passes it on for in-principle clearance by PPPAC. This is the case for PPP projects costing INR 250 *crore* (approximately US$40 million) and above and INR 500 *crore* (approximately US$80 million) for National Highway Development Plan (NHDP) projects.[3]

[3] For projects below INR 250 *crore* and below INR 500 *crore* for NHDP, depending on the cost estimate, the Standing Finance Committee, Expenditure Finance Committee, or Administrative Ministry is responsible for appraisal and clearance (see Planning Commission (2009a)). Regarding state level-projects, the committee or agency responsible for granting in-principle clearance depends on the institutional setup of the individual state.

Only after the **in-principle clearance** has been granted by the PPP Appraisal Committee, may the concerned contracting authority invite EOIs and develop the project documents further (Planning Commission, 2009a, pp. 8–9). In particular, draft concession agreements used by the authorities in the bidding process should be cleared by the PPP Appraisal Committee.

Where the PPP project is based on a "duly approved Model Concession Agreement" the in-principle clearance can be given by the PPP Cell (Planning Commission, 2009a, pp. 8–9). The PPP Appraisal Committee's approval is, in such cases, only necessary before inviting the technical and financial bids that respond to the RTP/RFP.

Projects that are granted In-principle Clearance by the PPP Appraisal Committee (or other competent authority) move onto the Phase 3, Procurement, of the PPP development pipeline and thereby "come onto the market."

Phase 3: PPP Procurement

The goal of Phase 3 is to select the best private sector partner for the PPP and to conclude contracting with this partner. This phase marks the end of the PPP development pipeline for the project being considered after which, should it continue, it enters operation in Phase 4.

The responsibility for this phase lies with the public sector contracting authority. Support can, as in the previous phases, be provided by dedicated PPP agencies.

The phase begins with **procurement preparation** by the contracting authority, including the review and updating of project information and the potential appointment of an independent monitor.

Regarding project information, the aspects which might have changed since Phase 2, include:

- Detailed technical scope
- Economic and financial appraisals of the project
- Environmental and social safeguard information
- Risk allocation and PPP mode
- Project implementation schedule
- Selected procurement strategy and process
- First drafts of the EOI notice/RFQ document and concession agreement

Changes might also include requests by the PPPAC clearance committee (or other relevant approving authority) that undertook the in-principle clearance at the end of Phase 2. The project's implementation schedule also has to be updated, should the timeline have changed. On the other hand, substantive changes at this stage have to be cleared by the approving authority.

The appointment of an Independent Monitor is optional at this point but considered good practice by the Department of Economic Affairs. The monitor is hired by the contracting authority to oversee the PPP project's process and to ensure transparency of tendering and budget allocations. The monitor's role is to certify that proceedings are conducted according to the desired standards of transparency and accountability. The monitor reports directly to the Approving Authority that makes the Final Approval decision.

An **Expression of Interest** (EOI) can optionally be included in PPP process as a "market sounding" exercise. The contracting authority thereby gauges interest in the PPP project in cases where the number and identity of potential bidders is not clear. The information obtained through the EOI is used to inform the RFQ and/or RFP. The decision on whether to include an EOI is made in Phase 2, choice of the most suitable procurement method. The EOI results in a list of interested firms that will receive RFQs in the next stage.

Through the **Request for Qualification** (RFQ), the contracting authority draws up a shortlist of qualified bidders. The RFQ is usually the first formal stage in the procurement (where no EOI is launched). The objective is to identify those potential bidders that are technically and financially qualified to implement the project. Shortlisted firms are invited to submit bids in the RFP stage. The RFQ process involves the following:

- Selection of qualifying criteria, based on draft project documents prepared in Phase 2.
- Preparation of the RFQ using model documents from the Department of Economic Affairs.
- Making the RFQ available to interested parties (to the list resulting from the EOI, should this stage have been included).
- Opportunities for questions and clarifications from interested parties.
- Evaluation and shortlisting using predetermined criteria, usually forming a list of three to six bidders for competitive bidding processes.
- Notification of all responding firms, as good practice, on whether they were successful in being shortlisted.

Final drafts of key bidding documents are developed based on the drafts from Phase 2. These comprise:

- The Request for Proposal (RFP) for the bid, including the Terms of Reference (TOR).
- The draft version of the Concession Agreement (CA) that will govern the PPP.

The Department of Economic Affairs writes that the RFP and CA are ordinarily not negotiable at the award stage. Model documents are available in the department's toolkit.

Final Approval must be obtained by the contracting authority from the PPP Appraisal Committee and the Approving Authority before launching the RFP. Thereby the key bidding documents mentioned above are assessed by these bodies taking into account the previous in-principle recommendation by the PPPAC (or other relevant Clearance Authority). Bids may be invited already before approval from the Approving Authority, once approval has been obtained from the PPPAC. In such cases, the due date, i.e., the deadline for responses to the RFP, has to be after the date on which the Approving Authority has given its approval.

An internal readiness check on the side of the contracting authority is conducted before the application for final approval can be put forward. The objective is to ensure a high probability that the project will pass the Final Approval and invite quality bids. At this point a senior internal reviewer assesses those projects whose case has been made by a project officer and Procurement and Evaluation team, using a tool provided by the Department of Economic Affairs.

The **bidding stage** comprises the **Request for Proposals (RFP)** and **bid evaluation**. The stage is in turn divided into RFP distribution and bid preparation, the bid evaluation and the selection of the preferred bidder.

- For the **Request for Proposals'** distribution and bid preparation, the final drafts of key bidding documents previously developed are circulated to shortlisted bidders. These are then given sufficient time to prepare their bids. Optionally, a Bid Security (i.e., sum of money) is demanded of the shortlisted bidders as an incentive for them to stay in the bid process and provide certainty for the contracting authority. A pre-bid meeting is held next, as an opportunity to clarify the provisions of the RFP and the draft concession agreement. Further queries can be put in writing to the authority, which can in turn revise the RFP and concession agreement accordingly. Once time for queries has elapsed, the bidding process proceeds based on the responses given to them.
- The e**valuation of the submitted bids** is carried out by the contracting authority against the pre-determined criteria listed in the RFP. The Procurement & Evaluation team, potentially supported by external advisors and smaller, specialist evaluation teams, is responsible for the evaluation. The Independent Monitor, should one have been appointed at the beginning of Phase 3, is present throughout the evaluation. In addition to conforming to formal requirements, the evaluation covers:
  - Technical evaluation: Technical requirements, including performance standards in order to meet the project's output requirements.
  - Financial evaluation: If the bid meets the minimum technical requirements it moves onto the financial evaluation. This takes into account the whole-of-life costs or payments in the bid at Net Present Value to allow comparison between bids.

The contracting authority should pay special attention to value for money (VfM) for the public sector in this stage. A tool is provided to quantify the VfM from the bids, providing for inputs of the risk acceptances made in the technical bid and the financial offers and a range of possible VfM outcomes based on uncertainties.

- The selection of the preferred bidder will be carried out based on the evaluation criteria. Usually, the bid with the best financial offer (lowest price, highest concession fee payment, etc.) is selected. Those bids which are financially evaluated have all passed the technical cut-off. The Independent Monitor (if assigned) must be present this stage. Besides the preferred bidder, a reserve bidder can also be selected should the process not work out with the former. Both are notified at this stage, as well as the unsuccessful bidders.

With contract finalization and award, a **private developer is appointed** and procurement reaches **technical close**. According to the Department of Economic Affairs, "the preferred bid should have already satisfied the base terms of the Concession Agreement," and thus "negotiation with the preferred bidder on the main terms of the contract is not encouraged in India" (Department of Economic Affairs, 2010c). Exceptions to this are a select set of issues for which a consultative process with the preferred bidder is conducted.

Once this is finished, the **concession agreement is signed** and the project will have been awarded.

At this point, the concessionaire has to bring the project to **financial close**, i.e., a commitment of all equity and debt financing. Should the project include a VGF component, final VGF approval will be decided at this stage.

Once the procurement has been finalized the PPP moves onto implementation and monitoring in Phase 4 of the PPP process, which lasts until the end of the PPP project's cycle.

Phase 4: Contract management and monitoring

Phase 4 begins with the technical closure at the signing of the concession agreement and stretches over the rest of the life cycle of the PPP project. The goal of this phase is to ensure that the project is implemented as specified in the concession agreement. This comprises:

- Implementation and operation of the project by the concessionaire.
- Performance monitoring and contract enforcement by the contracting authority.

The roles of the involved parties in contract management are already specified when the concession agreement is drafted (or, preferably, a model concession agreement drawn on) in Phases 2 and 3. These form the basis for the project's contract management. The responsibility for Phase 4 typically lies with the contracting authority's contract management team. It has the crucial role of monitoring contract performance and whether the private partner meets its contractual obligations.

Before the start of the PPP's life, **preparation for contract management** takes place. This covers ***two parts:***

- Those covered by the **concession agreement:** all performance-related requirements, the obligations for monitoring performance, what happens in the case of under-performance, contractual structures for major risk allocations, as well as payment terms, responsibilities and obligations of all parties, and processes for contract closure.
- That the sponsor has an adequate **institutional setup** in place so that it can manage the contract, this includes: a contract management team, contract management manual, and clear budgeting and cost allocation among contract partners. The PPP Cell can play a supporting role for the contracting authority. Regulatory agencies rather than the contracting authority may play a role in managing certain contract provisions (most commonly tariffs) depending on the PPP project's sector.

A tool is provided by the Department of Economic Affairs to assess readiness of the contracting authority in contract management and spot weaknesses that should be addressed.

During the PPP's contractual life, **performance monitoring** is undertaken by the contracting authority to ensure that the concessionaire meets the established performance levels. On the authority's side, monitoring is undertaken by the contract management team or independent engineers. Simultaneously, the concessionaire monitors the authority's performance against the obligations in the concession agreement.

The following are the project stages during which performance is monitored. Environmental and social performance requirements are explicitly included:

1. Pre-operative stage

- Environmental and social management assessments and plans.
- Land acquisition: Rights to land acquired (typically done by authority).

2. Construction stage

- Implementing environmental and social safeguards.

3. Operation stage

4. Contract closure and asset transfer stage

Each stage includes specific performance requirements, criteria for measuring performance, monitoring arrangements, and, frequently, penalties for underperformance such as financial penalties/compensation, withholding of payments, or remediation.

In its 2009 *Guidelines on Monitoring*, the Planning Commission recommended a two-tier institutional monitoring structure to ensure that both public and private parties are living up to their contractual obligations (Planning Commission, 2009b). The first tier is a project monitoring unit (PMU) at the project sponsor level which is to submit monthly performance reports to the second tier, the performance review unit (PRU) at the ministry or the state government level which initiates actions to rectify potential defaults or lapses. The reports would cover compliance with contractual conditions, adherence to timelines, assessments of performance, remedial measures, among others. The 2009 guidelines were adopted by the cabinet of the Government of India (GoI) in 2012 but have not been implemented fully.

→ **Contract amendments** will likely have to be made to the concession agreement as parameters change over the usually long lifetimes of PPPs. The central principle underlying any amendment is to maintain the balance of risk and reward between service users, the private concessionaire and the public contracting authority. Fairness and certainty are to be maintained for all parties in any review, including users.

To this end, a mechanism to review contract terms is established. Permitted tariffs and user charges are particularly salient ones. Contract amendments can take place through:

- Extraordinary reviews—All contracts should include provisions for amendments prompted by changes in circumstances that had not been foreseen at the time of signature.
- Regular Reviews—Certain contracts include provisions for reviews of specific elements, with precise timing and based on stipulated principles.

There are many potential risks to be managed in a contract review, including the impacts of major macroeconomic shocks, cost increases due to delays by the public sector in providing permits or resettlements, legal changes that significantly affect project costs, uncertainties about future costs, or errors in the forecasting of infrastructure demand.

The Department of Economic Affairs recommends that the regular reviews are undertaken, at minimum, every three years and usually more frequently.

→ **Dispute-resolution** mechanisms should also be established before the beginning of the project in the concession agreement. Interest in these is particularly high by the investor before entering long-term contracts in complex contexts. The mechanism should allow speedy resolution of issues, while living up to the required degree of technical, economic and financial sophistication. Good performance monitoring will detect issues before they escalate and channel them into effective resolution.

In India, **dispute-resolution processes usually include two stages:**

1. Amicable resolution (mutual discussions), where public and private sector representatives meet within a limited period of time. Should this not prove fruitful, either party can bring the dispute to the next step.

2. Arbitration, where, under Indian law, a contract is sent for adjudication of disputes by an arbitration panel outside the jurisdiction of the courts. The panel will decide on the dispute by issuing an award which is binding for all parties. This concerns both domestic and international arbitration. Compliance with the Act is binding on all parties, including State Governments. Costs for the arbitration process are incurred by the parties equally.

Mediation may be undertaken instead of, or after, the amicable resolution method (but before potential arbitration). In mediation, an impartial third party helps parties reach a mutually satisfactory and agreed—albeit non-binding—settlement of the dispute. As with amicable resolution, should the dispute not be resolved within a limited period of time, the dispute can be referred to arbitration.

2. THE INSTITUTIONAL FRAMEWORK GOVERNING PPPS

This section provides an overview of the principal institutions involved in PPP governance in India. A visual representation of the covered entities is provided in Figure 6 below, including select interrelations and interactions. The list of institutions covered in this section is not exhaustive, but includes those arguably most relevant for PPPs at the national level.

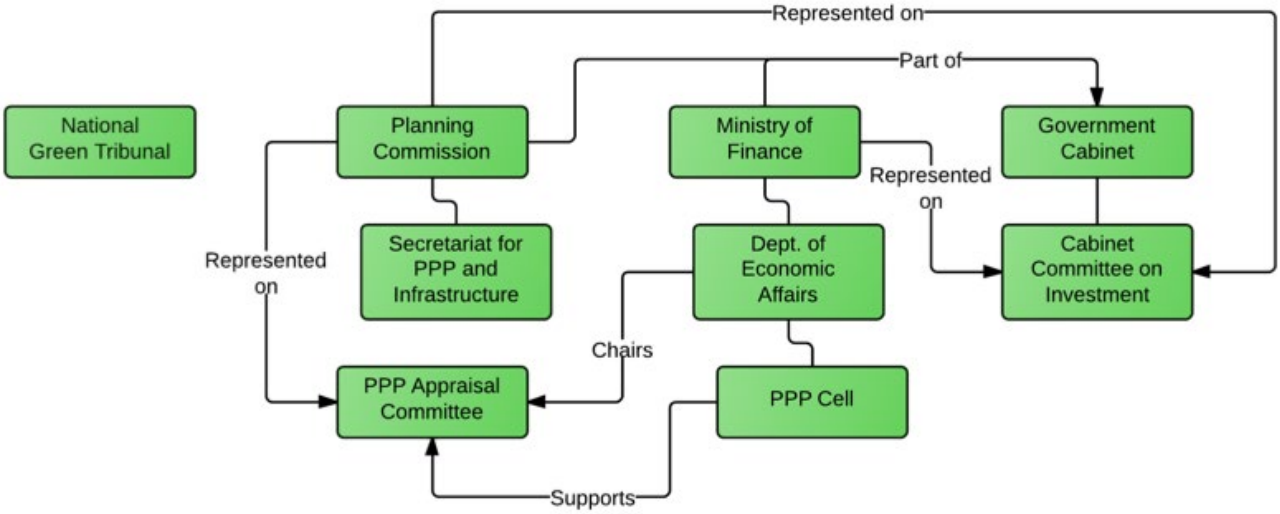


FIGURE 6 OVERVIEW OF INSTITUTIONS GOVERNING PPPS IN INDIA

Source: Author diagram.

Cabinet Committee on Investment

The Cabinet Committee on Investment was set up in January 2013 with the objective to identify "critical projects" and speed up their implementation, explicitly including the infrastructure sector (Cabinet Secretariat, 2013). Specifically, for selected projects, the committee sets time limits for ministries granting approvals and clearances, monitors whether these are being adhered to, reviews ministries' procedures for deciding on these, and even grants or refuses clearances and approvals itself, where the respective ministries are in delay. Beyond dealing with specific projects, that committee can also decide on measures for entire sectors to expedite approvals and clearances and can even discharge ministries from their competencies to promote investment and economic growth.

As in other cabinet committees, the Cabinet Committee on Investment is composed of the Prime Minister and various Ministers. Among the 15 Ministers on the committee are the Ministers of Finance, Road Transport and Highways, Defence, Coal, Water Resources and Urban Development. In addition, Special Invitees on the committee include the Deputy Chairman of the Planning Commission. The Asian Development Bank (ADB) has recently praised the Cabinet Committee on Investment for providing regulatory clearances for major infrastructure projects and thereby helping to shift the investment cycle upwards (ADB, 2013, p. 146). Oil and gas is one of the various sectors in which the committee is scrutinizing projects, in this case with a total value of over INR 100,000 *crore* (over US$16 billion) (Jayaswal, 2013).

Planning Commission

The Planning Commission of India is responsible for overall national economic strategic planning and, among other functions, develops the five-year plans with sectorial targets. Regarding PPPs, the Planning Commission holds the Secretariat for PPP and Infrastructure, which is "involved in initiating policies that would ensure time-bound creation of world class infrastructure delivering services matching international standards, developing structures that maximize the role of public–private partnerships (PPPs) and monitoring progress of key infrastructure projects to ensure that established targets are realized" (Planning Commission, 2013). The Secretariat maintains a database of PPP projects and has a library of PPP bid documents including model concession agreements. In the PPP process the Planning Commission's role is to "focus on due diligence, consistency with processes in other

sectors and consideration of best practice" (Planning Commission, 2009a). Together with the Department of Economic Affairs, the Planning Commission can be considered one of India's "PPP champions."

PPP Appraisal Committee (PPPAC)

The PPP Appraisal Committee was established in 2005 to act as a check on large (over INR 100 *crore*) potential PPP projects and thereby limit the GoI's exposure from an increasing number of such projects, as noted in the draft national PPP policy (Department of Economic Affairs, 2011, pp. 23–24; Planning Commission, 2009a). The draft policy (as well as the draft PPP rules) states that all central government PPP projects have to obtain clearance from the PPPAC before issuing the RFP (Department of Economic Affairs, 2012, p. 38). The exact process is laid out in the *Guidelines for Formulation, Appraisal and Approval of Central Sector Public Private Partnership Projects*.[4] The PPPAC is thus intended as a mechanism to ensure that all launched PPPs are financially viable, that concession agreement clauses safeguard the interests of users and the public, and that the contingent liabilities of the government are limited. The Committee is chaired by the Department of Economic Affairs and also includes Secretaries of the Planning Commission, Department of Expenditure, Department of Legal Affairs, and the project sponsoring authority.

PPP Cell

The PPP Cell, part of the Department of Economic Affairs of the MoF, is responsible for "mainstreaming PPPs" by setting policy, schemes, programs, capacity building among other instruments (Department of Economic Affairs, n.d.). The body is also known as a nodal agency or office. Similar bodies, also known as PPP Units, have been set up in many other countries. Areas of competence of the PPP Cell include:

- Issues related to the examination and approval of all central level PPP projects, with a cost above INR 100 *crore* (around US$ 16.2 million) and below INR 250 *crore* (around US$40.5 million) for all sectors except for projects under the National Highways Development Project (NHDP) where it is responsible for projects costing INR 250 *crore* and above and less than INR 500 *crore* (around US$81 million).
- Issues and proposals subject to clearance by the Public Private Partnership Appraisal Committee (PPPAC).
- Issues and proposals around Viability Gap Funding (VGF) Scheme and the India Infrastructure Project Development Fund.
- Mechanisms to facilitate PPPs, including handling technical assistance by bilateral and multilateral agencies on mainstreaming PPPs and supporting state and local governments.
- Training programs and strategies for capacity building on PPPs.
- Advocacy to increase the acceptance of PPPs.
- Institution building to mainstream PPPs.
- Provision of information and maintenance of public databases on PPPs.[5]

Counterparts of the central PPP Cell exist at the non-central level in 25 states and union territories with different but similar competencies to the central cell.[6] These are frequently called PPP Nodal Offices.

The PPP Cell is located under the **Department of Economic Affairs** (DEA) which, along with the Planning Commission, champions PPPs in India. The DEA, in turn, is located in the **Ministry of Finance** which is responsible for assessing concession agreements from the financial and government expenditure perspectives, deciding on guarantees to be provided, and the overall evaluation of risk allocations from the investment and banking perspectives (Planning Commission, 2009a).

National Green Tribunal

The National Green Tribunal (NGT) of India was established by the Indian Parliament in 2010 based on a constitutional provision that assures Indian citizens the right to a healthy environment. Essentially a fast-track court, the tribunal's purpose is the "effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources

[4] See Planning Commission (Planning Commission, 2009a).
[5] Including through the websites: www.pppinindia.com and www.pppindiadatabase.com.
[6] See http://www.pppinindia.com/contact-cells.php .

including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto" (Ministry of Law & Justice, 2010, p. 1). The specialized body is mandated to resolve cases within six months of filing (National Green Tribunal, n.d.). In addition, it is not bound by the procedure stipulated in the Code of Civil Procedure of 1908, but by principles of natural justice which facilities faster procedures. By exclusively dealing with environmental issues, the tribunal also reduces the workload of the higher courts. The tribunal also deals with PPPs where environmental issues are concerned and is seen as an institution that reduces delays from such issues.

The rationale behind the establishment of the tribunal is also rooted in India's positions on sustainable development and environment put forward at the 1992 UN Conference on Environment and Development and the 1972 UN Conference on the Human Environment (Ministry of Law & Justice, 2010, p. 1). WWF India praises the tribunal as a "significant move" for quick and efficient handling of environmental cases and for being only the third tribunal of its kind after Australia and New Zealand (WWF India, n.d.). WWF also notes its wide jurisdiction to order compensation, relief and restoration of ecology in accordance with the "polluter pays" and the "precautionary" principles. To date, the NGT has made 157 judgements that are available on its website.[7]

[7] Up to and including October 7, 2013, see: http://greentribunal.in/judgement.php.

SECTION III

The Contribution of Environmental and Social Safeguards to VfM in India

SECTION III – THE CONTRIBUTION OF ENVIRONMENTAL AND SOCIAL SAFEGUARDS TO VFM IN INDIA

This section presents the four environmental and social safeguards that form the backbone of this assessment. These safeguards are: the environment clearance, the forest clearance, the wildlife clearance, and the requirements on land acquisition and resettlement. These safeguards exist in order to ensure that development does not take place at the expense of the environment and livelihoods, and, where possible, to minimize the negative social and environmental impacts associated with infrastructure construction and operation.

The structure of the section is as follows: each safeguard is presented within its relevant background and context, followed by a more detailed description of the processes undertaken by project proponents in order to obtain the clearances/approvals. This degree of detail is provided in order to demonstrate the comprehensiveness of the environmental and social safeguards—in many regards they represent best international practice. However, what is also revealed (in the analysis section following the description of each of the safeguards) obtaining the various clearances is administratively costly (both in time and money), and, more importantly not sufficiently linked to meaningful improvements on the ground. The reasons for this are elaborated upon throughout the section. If this disconnect between the safeguards and real environmental and social impacts continues, the end result will be a public infrastructure market antithetical to long-term value for money. Some strategies to address these challenges are put forward in the recommendations section.

1. ENVIRONMENTAL CLEARANCE

Introduction to the safeguard

The environmental clearance is a safeguard concerning the potentially adverse impacts of infrastructure construction on the natural environment, and is issued by the Ministry for Environment and Forests (MoEF). It has been a mandatory safeguard since January 1994, when the EIA Notification to the Environmental Protection Act (1986) made the clearance mandatory for any person or entity seeking to undertake any new infrastructure project or the expansion or modernization of existing industry or infrastructure (MoEF, 1994a).

Since coming into force as a statutory requirement, the environmental clearance process has undergone several amendments. Notably, a 2006 EIA Notification decentralized much of the power from the Central Union to the State Governments. Depending on the size, capacity and surface area of the proposed project, the onus of clearing a significant number of projects now falls to the state-level authority. Since 2006, all projects and activities are broadly categorized into "Category A" or "Category B" based on the spatial extent of potential impacts and potential impacts on human health and natural and human-made resources (MoEF, 2006).

As depicted in Figure 7 below, the first step in the environmental clearance process is the division of projects into Category A that require clearance at a central level, and Category B that seek clearance at the state level. In the case of thermal power plants, for instance, the operational capacity must exceed 500 megawatts (MW) in order to reach the Category A threshold. In the case of Category B projects, the state government will further classify the projects as either Category "B1" or "B2"'; the former require preparation of environmental impacts assessment (EIA) reports, while the latter do not.

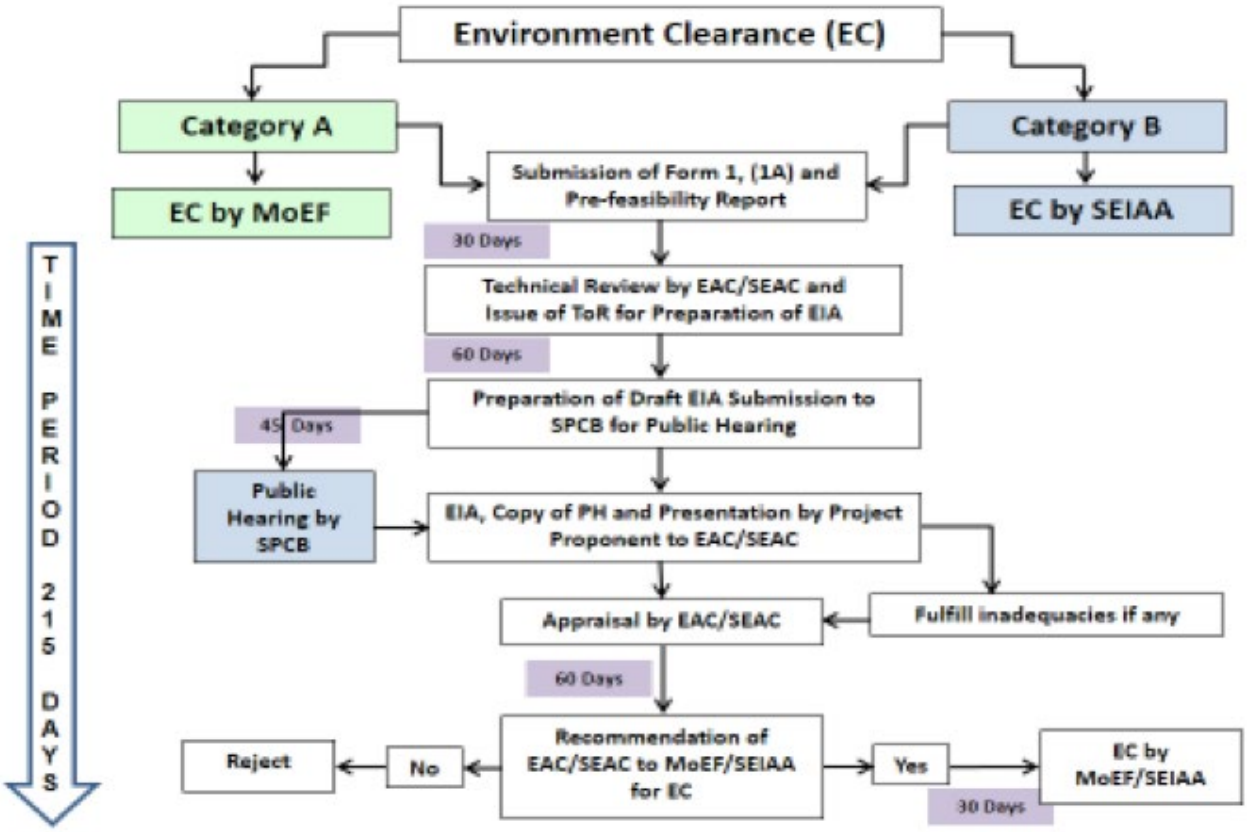


FIGURE 7 THE ENVIRONMENTAL CLEARANCE FRAMEWORK

Source: MoEF, 2006a.

The 2006 EIA Notification also resulted in a certain standardization of procedures, and the development of sector-specific terms of reference (ToR) documents and guidance manuals on conducting EIAs. The objective in generating these standardized documents was to streamline the environmental clearance process (MoEF, 2009a). It was also made clear that large-scale infrastructure projects cannot begin construction without prior environmental clearance (PEC) from either the State Environmental Impact Assessment Authority (SEIAA) or the equivalent in Environmental Impact Assessment Authority (EIAA) (Envirotrends, 2009).

As per a subsequent 2009 EIA Notification, the environmental clearance process became more transparent, at least in theory, and accessible to the general public through a "public hearing/consultation" process. Following this amendment, project proponents are responsible to make relevant documentation available in the public domain and to advertise (at their own cost) in two local newspapers where the project is located. More controversially, however, it became no longer necessary for modernization or expansion projects to obtain additional environmental clearance if there is no additional water or land requirement, and if there is no increase in the pollution load. It was accepted that project developers could "self-certify" that no additional waste, water or pollution will be incurred (Centre for Science and Environment [CSE], n.d.a).

Pre-Concession Requirements

The environmental clearance itself must be obtained prior to the signing of the concession contract, and consequently prior to the commencement of the construction and operation phases. The responsible entity for obtaining the clearance varies between sectors. In the two focus sectors of this report, however—namely Highways and Roads and Ultra Mega Power Plants (UMPPs)—the government takes responsibility for getting all of the necessary clearances (environment, land acquisition, forest etc.), making the investment climate more conducive to private participation (Department of Economic Affairs, 2009). In the road sector, the National Highways Authority of India (NHAI) obtains the environment clearance as well as other clearances. In the case of ultra

mega power projects, the clearances are obtained prior to the award of the project by the relevant government entity. This is an interesting arrangement that is revisited in the *Recommendations Section*. For lower-capacity thermal power plants (TPPs), however, and in some other sectors, it is the responsibility of the private entity/developer to obtain the required clearances.

It must also be mentioned that the environmental clearance is subject to the obtaining of prior forest clearance and wildlife clearance from the respective ministries (including clearance from the Standing Committee of the National Board for Wildlife as applicable). These two safeguards are addressed in the following section.

Adherence to the Clearance Process

The environmental clearance process in India consists of four stages: Screening, Scoping, Public Consultation and Appraisal.

- *Screening* is done to ensure time and resources are directed to proposals of environmental significance. This step determines whether or not the proposed project requires an EIA and, if so, the level of assessment that would be required. The screening includes an approximate assessment of the land area, the people and biodiversity potentially affected.
- *Scoping* identifies they key issues to be further investigated and defines the boundary and time limit of the EIA.
- *Public consultation* is undertaken to obtain response from the local affected peoples and interested parties (i.e., NGOs).
- Finally, the *appraisal* of a project rests on the scrutiny of the Environment Appraisal Committee (EAC) at the central level and the State Environmental Appraisal Committee (SEAC) at the state level. The stages of granting the Environmental Clearance are outlined in Box 1.

As a first step, the project proponents assess their project according to the threshold limits outlined in EIA Notification 2006. Depending on this assessment, they then submit an application to either the EAC or SEAC. The respective SEAC and EAC units can return the application if the project developer has not submitted the application as per the correct categorization of project. The following forms must be submitted in the first instance:

- The environmental clearance application form ("Form 1").
- A prefeasibility report of the project.
- A location map of the project site.

Checklist of information required in Form 1 of the EIA Notification

No	Information required in Form 1	Collected? (yes, no)
1	Basic project information (name, location etc)	
2	Details of activity related to the project:	
2a	Actions causing physical changes in the locality	
2b	The project's use of natural resources	
2c	Associated substances or materials that could be hazardous or harmful	
2d	Production of solid wastes	
2e	Release of pollutants into the air, ground and waterways	
2f	Generation of noise and vibration, and emissions of light and heat	
2g	Risk of accidents	
2h	Factors that could lead to cumulative impacts or consequential effects	
3	Details of environmentally sensitive areas within a certain distance of the project site	
4	Proposed TOR for the EIA study	

FIGURE 8 SAMPLE CHECKLIST FOR FORM 1 OF EIA NOTIFICATION

Source: Ministry of Finance, n.d.a.

Generally the EAC/SEAC committees assessing these applications will consist of experts from ecosystem management, air/water pollution control, water resource management, flora/fauna conservation, land-use planning, social science and rehabilitation, and other relevant subject areas. Representatives of NGOs are also permitted to sit in on the EAC/SEAC meetings, as are the project proponents themselves.

These committees establish whether or not a proposed project warrants a thorough EIA, after an initial evaluation of the possible implications of a particular project and its location. In the case of large infrastructure projects—the focus of the current study—an EIA is almost always required. In general, projects requiring the EIA are those that (MoEF, n.d.a):

- Significantly alter the landscape, land use pattern and lead to concentration of working and service population.
- Require upstream development activity like assured mineral and forest products supply or downstream industrial process development.
- Manufacture and/or handle and use hazardous materials.
- Are sited near ecologically sensitive areas, urban centers, hill resorts, or places of scientific and religious importance.
- Could cumulatively cause significant environmental damage.

The EAC/SEAC will then issue a terms-of-reference (ToR) in preparation of the EIA and EMP report (if deemed necessary), on the basis of the information provided by the proponent. If needed, the SEAC/EAC would visit the site, hold public consultation and meet experts to decide on the parameters of the ToR. The final ToR has to be posted in the website for public viewing. If the EAC does not generate the ToR within the stipulated time (60 days), the project proponents can go ahead with their own terms for the EIA report (CSE, n.d.b).

BOX 1. STAGES OF EC GRANT AND APPROVAL

1. Screening for new projects (Category B projects): Applications seeking prior environmental clearance made in Form 1 by the concerned State- level Expert Appraisal Committee (SEAC) are scrutinized at this stage to determine whether any further environmental studies for preparation of an environmental impact assessment (EIA) are needed. The projects requiring an Environmental Impact Assessment report shall be termed Category B1 and remaining projects shall be termed Category B2 and will not require an EIA.
2. Scoping and Technical Review and Issue of TOR for the preparation of EIA: In the scoping process, the Expert Appraisal Committee in the case of Category A projects or activities, and State level Expert Appraisal Committee in the case of Category B1 projects or activities, including applications for expansion and/or modernization and/or change in product mix of existing projects or activities, determine detailed and comprehensive TOR addressing all relevant environmental concerns for the preparation of an EIA.
3. Public Consultation: In this process, the concerns of local affected persons and others who have a plausible stake in the environmental impacts of the project are ascertained with a view to take into account all the material concerns in the project or activity design as appropriate. All Category A and B1 projects or activities are required to undertake this. The public consultation has two stages: the first, a public hearing at the site or in close proximity held by the State Pollution Control Board (SPCB) or the Union territory Pollution Control Committee (UTPCC) and the second, obtaining responses in writing from other concerned persons in a prescribed format (Appendix IIIA of the EIA Notification).
4. Appraisal: Appraisal involves in-depth scrutiny by the Expert Appraisal Committee (EAC) or State Level Expert Appraisal Committee (SEAC) of the application and other documents like the Final EIA report, outcome of the public consultations (including public hearing proceedings) submitted by the applicant to the regulatory authority concerned for grant of environmental clearance.
5. Recommendation of EAC/SEAC to MoEF/SEIAA for EC: The regulatory authority then considers the recommendations of the EAC or SEAC concerned and conveys its decision to the applicant within 45 days of the receipt of the recommendations of the EAC or SEAC concerned or, in other words, within 105 days of the receipt of the final EIA report, and where EIA is not required, within 105 days of the receipt of the complete application with requisite documents, except as provided in special cases.

Source: Ministry of Finance, n.d.a.

The Environmental Impact Assessment (EIA)

The purpose of the EIA is to identify and evaluate the potential impacts (beneficial and adverse) of development and projects on the environmental system (MoEF, n.d.a). The EIA report is the principle document upon which the EAC/SEAC ultimately bases the final environmental clearance. The EIA report requires that the project description, a description of the environment, the anticipated environmental impacts and mitigation measures, the environmental monitoring program, any additional studies, project benefits and the environment management plan proposed be covered.

Only QCI-approved consultants can conduct EIA studies and present results to SEAC/EAC (MoEF, 2006b; Quality Council of India, 2013). In developing the EIA, guidance manuals are available for various sectors, namely: mining, mineral beneficiation, ports and harbours, airports, building construction, townships, asbestos, highways, coal washeries, aerial ropeways, nuclear power plants, nuclear fuel processing plants and nuclear waste management plants (MoEF, 2009a). The EIA should be prepared on the basis of the existing background pollution levels (using data not older than the past three years) vis-à-vis contributions of pollutants from the proposed plant. The EIA should address some of the basic factors listed in the right-hand column of Table 1 below.

TABLE 1 GENERIC STRUCTURE AND COMPONENTS OF THE EIA REPORT

GENERIC STRUCTURE OF THE EIA REPORT	BASIC COMPONENTS TO BE INCLUDED IN THE EIA
• Introduction • Project Description • Analysis of Alternatives (Technology and Site) • Description of the Natural Environment • Anticipated Environmental Impacts & Mitigation Measures • Environmental Monitoring Program (EMP) • Additional Studies • Project Benefits • Environmental Cost Benefit Analysis • Environmental Management Plan • Summary & Conclusion • Disclosure of consultants engaged	• Meteorology and air quality: Ambient levels of pollutants such as sulphur dioxide, oxides of nitrogen, carbon monoxide, suspended particulate matters • Hydrology and water quality • Site and its surroundings • Occupational safety and health • Details of the treatment and disposal of effluents (liquid, air and solid) and the methods of alternative uses • Transportation of raw material and details of material handling • Control equipment and measures proposed to be adopted

Source: MoEF, n.d.a

The final EIA report is examined or appraised by the EAC or SEAC, depending on the category in which the project falls, and either accepted or rejected. The entire process of the clearance generally takes anywhere from 9 to 12 months (Sharma & Choudhary, 2009). Once granted, the EC is then valid for five years (exceptions are river valley projects, which are valid for 10 years, and mining projects which are valid for 30 years). A graphic summary of the entire process can be seen in Figure 3 below.

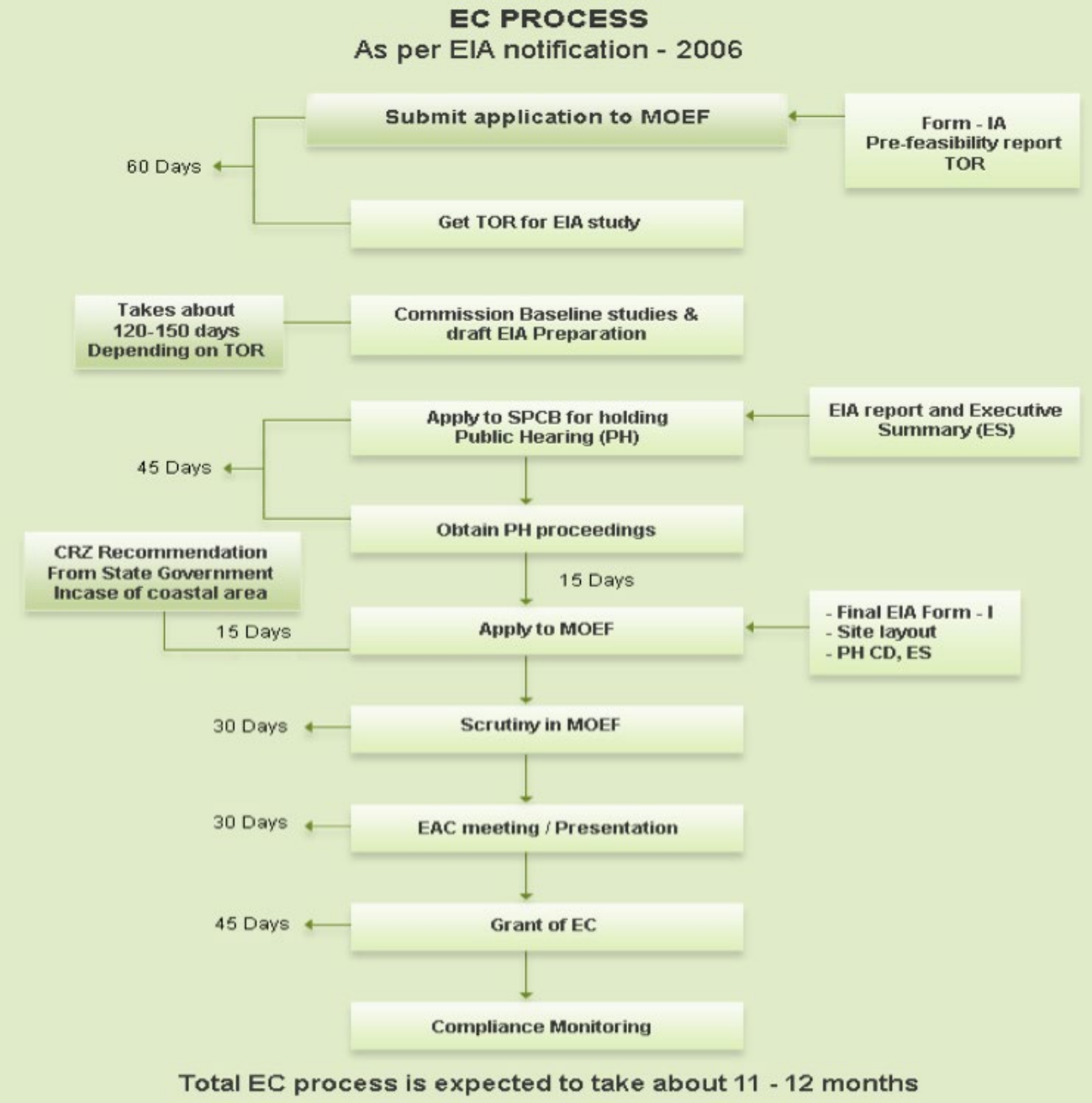


FIGURE 9 FLOW DIAGRAM OF ENVIRONMENTAL CLEARANCE PROCESS

Source: Ministry of Finance, n.d.a.

Post-Concession Requirements

1. The Environmental Management Plan

As per the 2006 EIA Notification, the implementation of an Environmental Management Plan (EMP) is mandatory and is to be included with the submission of the final EIA report to the EAC/SEAC. The EMP should indicate the details as to "how various measures have been or are proposed to be taken" (MoEF, n.d.b). Sample considerations of the EMP can be found below in Box 2. The costs of satisfying the various mitigation measures in the EMP should be included as an integral component of the total project costs. From a legal perspective, the concessionaire, having signed a binding contract to satisfy all "project requirements,"

is technically obliged to implement, monitor and report on the EMP to the regulatory authority. However, anecdotal evidence obtained in the course of this research suggests major capacity gaps in monitoring the EMP implementation. Its contribution to safeguarding the natural environment is thus called into question.

BOX 2. ELEMENTS OF THE ENVIRONMENTAL MANAGEMENT PLAN (EMP)

1. Liquid Effluent
    - Effluent from the industrial plants should be treated to the standards prescribed by the Central/State Water Pollution Control Boards.
    - Soil permeability studies should be made prior to effluent being discharged into holding tanks or impoundments and steps taken to prevent percolation and ground water contamination.
    - Special precautions should be taken regarding flight patterns of birds in the area. Effluent containing toxic compounds, oil and grease has been known to cause extensive death of migratory birds. Plants should not be located in such sensitive areas.
    - Deep-well burial of toxic effluent should not be used as it can result in resurfacing and ground water contamination. Resurfacing has been known to cause extensive harm to crop and livestock.
    - In all cases, efforts should be made for reuse of water and its conservation.

2. Air Pollution
    - The emission levels of pollutants from the different stacks should conform to the pollution control standards prescribed by central or state boards.
    - Adequate control equipment should be installed for minimizing the emission of pollutants from the various stacks.
    - In-plant control measures should be taken to contain the fugitive emissions.
    - Infrastructural facilities should be provided for monitoring the stack emissions and measuring the ambient air quality including micro-meteorological data (wherever required) in the area.
    - Proper stack height as prescribed by the central/state pollution control boards should be provided for better dispersion of pollutants over a wider area to minimise the effect of pollution.
    - Community buildings and townships should be built up-wind of plant with one-half to one kilometre greenbelt in addition to physiographical barrier.

3. Solid Wastes
    - The site for waste disposal should be checked to verify permeability so that no contaminants percolate into the ground water or river/lake.
    - Waste disposal areas should be planned downwind of villages and townships.
    - Reactive materials should be disposed of by immobilizing the reactive materials with suitable additives.
    - The pattern of filling disposal site should be planned to improve landscaping and be approved by appropriate agency: the appropriately pretreated solid wastes should be disposed of according to the approved plan.
    - Intensive programs of tree plantation on disposal areas should be undertaken.

4. Noise and vibration
5. Adequate measures should be taken for control of noise and vibrations in the industry.
6. Occupational Safety and Health: Proper precautionary measures for adopting occupational safety and health standards should be taken.
7. Prevention, maintenance and operation of Environment Control Systems
    - Adequate safety precautions should be taken during preventive maintenance and shut down of the control systems.
    - A system of interlocking with the production equipment should be implemented where highly toxic compounds are involved.

8. Housekeeping: Proper housekeeping and cleanliness should be maintained both inside and outside of the industry.
9. Human Settlements
    - Residential areas should be located away from the solid and liquid waste dumping areas. Meteorological and environmental conditions should be studied properly before locating a site near residential areas in order to avoid air pollution problems.
    - Persons who are displaced or have lost agricultural lands as a result of locating the industries in the area should be properly compensated.
10. Transport Systems
    - Proper parking places should be provided for trucks and other vehicles used by the industries to avoid any congestion or blocking of roads.
    - Siting of industries on the highways should be avoided as it may increase road accidents because of the substantial increase in the movements of heavy vehicles and unauthorized shops and settlements arising near the industrial complex.
    - Spillage of chemicals/substances on roads inside the plant may lead to accidents. Proper road safety signs both inside and outside the plant should be displayed for avoiding road accidents.
11. Recovery/reuse of waste products: Efforts should be made to recycle or recover the waste materials to the extent possible. The treated liquid effluent can be conveniently and safely used for irrigation of lands, plants and fields for growing non-edible crops.
12. Vegetal Cover: Industries should plant trees and ensure vegetal cover in their premises. This is particularly advisable for those industries with more than 10 acres of land.
13. Disaster Planning: Proper disaster planning should be done to meet any emergency situation such as fire, explosion, sudden leakage of gas etc. Firefighting equipment and other safety equipment should be kept ready for use during disaster/emergency situations, including natural disasters like earthquakes or floods.
14. Environment Management Cell: Each industry should identify within its setup a department/section/cell with trained personnel responsible for environmental management as required for planning and implementation of the projects.

Source: MoEF, n.d.b

2. Reporting

Project managers are required to submit half-yearly compliance reports in respect of the stipulated prior environmental clearance terms and conditions in hard and soft copies to the regulatory authority concerned. Reporting milestones are outlined throughout the construction, operations and maintenance phases and are generally more stringent during the construction phase. In principle, compliance reporting is due on June 1 and December 1 of each calendar year. The compliance reports are to be publicly accessible, and are to be displayed on the website of the concerned regulatory authority. Additionally, copies are to be made for anyone upon request/application.

In the course of the research for the present report, the researchers looked routinely and rigorously for such reporting on the relevant pages of the offices of the MoEF and the State Pollution Control Boards, but with little success. On some occasions, the space holder would be in place, but without a link to the report in question. The authors' frustration with this lack of information, in spite of legal mandates to the contrary, is shared by many NGOs and concerned citizens in India. Lack of transparent and publicly accessible monitoring and compliance reporting is a major and widely recognized barrier to safeguarding the environment and the communities impacted by infrastructure development.

i. Fines for Non-Compliance and Contract Termination

Concessionaires who fail to comply with environmental regulations can be fined by the relevant authorities. The charge would generally be in the order of one or two lakh rupees (approx. US$1,600 to US$3,200) (The Times of India, 2013). A recent instance of the use of this safeguard in action was following a damning report led by Sunita Narain of the Centre for Science and Environment, when Adani Group was fined INR 200 *crore* by the MoEF. Within Adani Group's special economic zone (SEZ) and port area at Mundra, an inspection committee revealed widespread destruction of mangroves and the blocking of creeks, preventing them

from reaching the sea in some cases (Vora, 2013). The MoEF and others, however, would like to see the fines increased to present a meaningful penalty to project developers; it is widely felt that the fines are currently negligible in comparison to the gains concessionaires make in generating negative environmental externalities (MoEF, personal communication, Sept. 3, 2013).

Going a step further, another safeguard in place is of course the potential threat of contract termination following a failure to comply with project requirements, or in the language of the concession documents in the "event of default" on contract obligations. If a project developer does not comply with project requirements (encompassing all commitments under the EIA and EMP) then the authority is entitled (but not required) to terminate the concession contract. This language, denoting entitlement rather than obligation, is noteworthy, particularly in light of the tremendous amount of rent seeking that goes into obtaining and maintaining clearances by those with vested interests (Development Alternatives, personal communication, Aug. 27, 2013).

Analysis

i. The Environmental Clearance process is generally heavy on pre-concession requirements and lax on post-signing monitoring of the concession contract requirements.

The environmental clearance must be obtained prior to the signing of the concession contract, and thus prior to the construction and operation phases. It is essentially a preemptive safeguard in this respect, and although the clearance is conditional on biannual reporting and the implementation of the EMP, there is indication that the MoEF is not equipped to monitor and enforce the post-concession safeguards (MoEF, personal communication, Sept. 3, 2013). Research for this report has thus revealed is that in the drive to obtain the environment clearance (pre-concession) and hence begin construction, the post-concession monitoring and follow-up is seldom undertaken rigorously and systematically in practice.

Thus the pre-concession requirements for the environmental clearance occupy the most cost and energy, both from concessionaires' perspective, keen to succeed in passing through the various regulatory hoops, and from the regulators' perspective, as this is the occasion to exert their power and influence. Notably, compliance with post-concession requirements provides relatively less flashy stories than pre-clearance hold-ups, and as such they are not as prevalent in mainstream media and perhaps in the collective consciousness.

ii. There are significant capacity gaps throughout the environmental clearance process.

Closely related to the issue of lax compliance monitoring is the apparent lack of capacity at the MoEF to follow up with all of the clearances. There are only seven MoEF offices in India—the regional offices—charged with the task of processing and reviewing the biannual reports of literally thousands of projects. They are situated at Shillong, Lucknow, Chandigarh, Bhopal, Bhubaneswar, Dehradun and Bengaluru. It was disclosed to the researchers of this project that approximately 50–60 new projects are granted environmental clearance each month, meaning that each year at least 1,200 new reports (from 600 newly cleared projects) must be tracked (MoEF, personal communication, Sept. 3 2013). Deeming the substance of the biannual reports to be inconsequential, project managers in practice often simply change the date from the previously submitted report for the next submission (Development Alternatives, personal communication, August 27, 2013). A massive capacity gap at the MoEF to monitor compliance effectively has been expressed by many stakeholders.

Aside from the capacity gaps identified at the MoEF, there is a general concern for the quality of the EIAs, and the capacity of the independent consultancies undertaking them. These consultancies typically are not specialists, but hold the broad capability to conduct a prescribed EIA. Thus the technical and sector-specific expertise related to specific environmental domains (e.g., ecologically sensitive zones) is not a principal factor when project proponents select a consultancy; price is the main consideration (CSE, n.d.c). This, however, is not a challenge unique to India but can be said of EIAs in many parts of the world. Also of concern in the Indian context, however, are the notable cases demonstrating conflict of interest when the project developer is a large company with many subsidiaries, some of whom possess the capacity to conduct EIAs. A notable case is Tata consulting undertaking the EIAs for Tata Power (Bhargava, Sampath, Bidwai, & Ete, 2012).

Related to the capacity of the independent consultancies undertaking EIAs is also a concern for their perceived corruptibility. Anecdotal evidence suggests that the consultants are sometimes asked to shorten the time frame for their methodology, to speed up the issuance of a report, or to omit relevant information in their findings. To illustrate the point, in 2009 Vimta Labs, a

Hyderabad-based private laboratory, processed an EIA which was ultimately judged as being in "gross violation" the ToR issued by the MoEF for the project. The consultant writing the report did not provide any information on the existing land-use patterns of the acquired land—which was actually a wetland and not a "wasteland" as stated in the EIA report (CSE, n.d.d). A subsequent inspection committee concluded the consultant "tried to hide the factual information about the site and its surrounding areas" (CSE, n.d.d); it is critical, therefore, to create an enabling environment to enhance the capacity and integrity of these consultancies to improve the environmental safeguards.

iii. The Supreme Court of India has played an important role in the protection of the environment.

As presented by Agarwal (2005, p. 235), a consideration of litigation case studies reveals that the Supreme Court of India has played a vital role in the protection and improvement of the environment. Case law shows elaborate discussions on the concept of sustainable development, which has been accepted as part of the law of the land. Through various rulings, the Supreme Court has expounded the principles of "polluter pays," the "precautionary principle" and "intergenerational equality"—essential features of sustainable development in the law. According to Agarwal (2005), the jurisdiction of the Court has been expanded through public interest litigation.

In the course of the research conducted for this publication, Delhi-based NGOs including Development Alternatives and the Centre for Science and the Environment were interviewed and expressed the opinion that the higher judiciary is a trustworthy system. Other sources, however, such as those at the Indian School of Business (ISB), drew attention to the significant time delays induced by backlog of environmentally related cases in courts, and question the efficacy of the environment clearance safeguard in light of these prohibitive delays.

iv. The National Green Tribunal (NGT) has played an important role in enforcing environmental safeguards since its recent inception.

The backstop for non-compliance with environmental regulations is indeed the judicial system. Over the past couple of decades the number of cases based on environmental pollution, ecological destruction and conflicts over natural resources coming up in the courts system has increased (Agarwal, 2005). Fortunately, the National Green Tribunal (NGT) is making significant strides towards the expeditious and efficient handling of such environmental legal disputes. The NGT has only been functioning since 2011, but in its short existence has adjudicated many cases relating to environmental protection and conservation, as illustrated in Figure 10 below. With the objective to clear cases within six months of filing, the NGT has been earning a reputation of being a "fast track" for environmental cases. While the main court is based at New Delhi, there are other benches at Chennai, Bhopal, Pune and Kolkata in order for the judiciary to reach more remote parts of India (WWF India, n.d.).

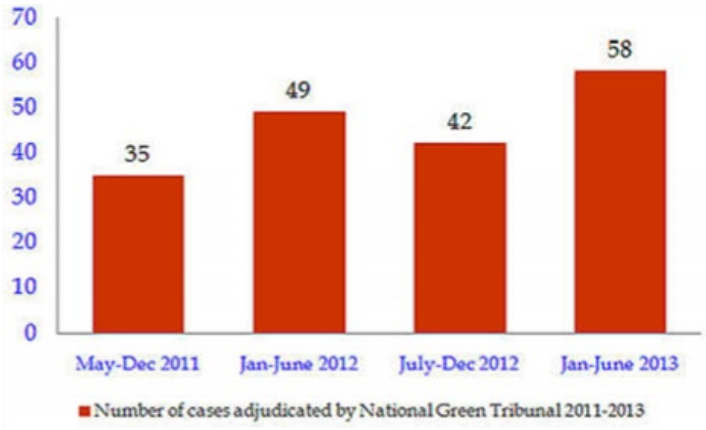


FIGURE 10 NGT CASES 2011–2013

Source: WWF India, n.d..

The value of the NGT, however, runs deeper than its efficiency. It has to date delivered a number of significant judgments, setting precedent for environmental protection across India and demonstrating the importance of sustainable development principles. An interestingly case worth mentioning here is the recent fine imposed by the NGT on the Union MoEF itself for its failure to protect a no-development zone from industrial development. The MoEF is contesting the accusation on the grounds that they do not have the capacity to keep up with the number of notifications they are expected to monitor and maintain (Shrivastava, 2013). In another recent ruling, the NGT revoked the environmental clearance granted to NCC in Sompeta, Andhra Pradesh on the basis that the land was wrongly declared a wasteland when in fact it was an important wetland with economic and environmental significance (CSE, n.d.d). The creation of this tribunal is therefore an important step in the access to justice on matters concerning the environment; its mandate is much wider than earlier environmental courts and authorities and other such Courts (WWF India, n.d.).

In terms of the present research on the implementation and efficacy of environmental safeguards in infrastructure, the value of the NGT is in the enforcement of the environmental and forest clearance regulations and in the power of the courts to revoke clearances for non-compliance. Research conducted in preparation of the present report, however, has revealed mixed sentiments regarding the efficacy of the NGT. While many praise it as one of the few reliable sources of recourse for violation of environmental regulations in the country, others have complained that it has only led to more rent seeking and lobbying (MoEF, personal communication, Sept. 3, 2013). With only a few years to pass judgment, it is difficult to be sure of the scale and influence of its impact, but undoubtedly the strengthening of the judiciary in enforcement is of critical importance in order to deliver VfM for the citizenry.

2. FOREST CLEARANCE

Introduction to the safeguard

India was covered with 685,790 square kilometres of forest in 2011, or 23 per cent of its total land area (The World Bank, n.d.). This natural wealth is under constant threat by development projects, however—reflecting global trends—and according to the Centre for Science and Environment, this figure itself represents an almost 25 per cent reduction of forest cover since 1981 (CSE, 2011).

The Forest Conservation Act (1980) was enacted to provide for the conservation of forests in India. It was enacted with the aim of restricting the use of forestland for non-forest purposes, and to prevent the de-reservation of forests that had been reserved under the Indian Forest Act (1927). Since the establishment of the Act, the rate of diversion of deforestation has slowed from 14,300 hectares per annum (pre-1980) to roughly 15,000 hectares per annum (present) (MoEF, n.d.c). The Act has succeeded in controlling the indiscriminate release of forestland for non-forestry purposes.

As per Section 2 of the Forest Conservation Act, any project proposal that includes the alteration ("diversion") of areas of reserved forests, protected forests or any recorded forestland towards any non-forest purpose, even if the area is privately owned, requires prior approval of the Central Government of India (MoEF, 2004). To this end, the Act lays down the prerequisites for the diversion of forest land for non-forest purposes. In the case of infrastructure development, the Act manifests itself through the requirement that project developers obtain a forest clearance from the MoEF. The diversion of forestland for projects is broken down by sector in Figure 11 below.

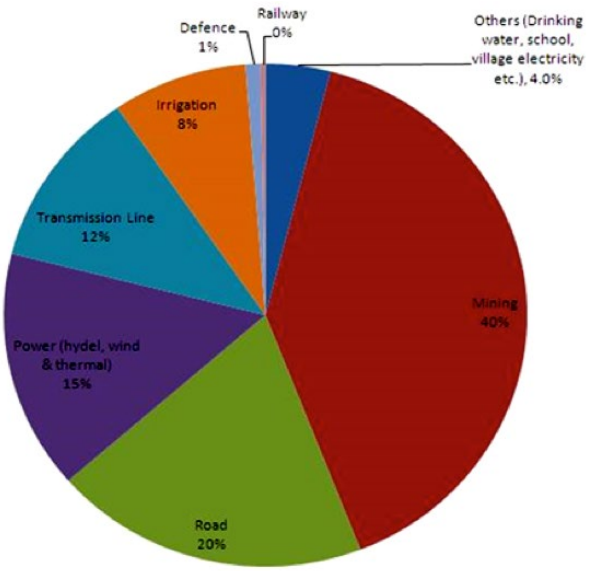


FIGURE 11 FOREST LAND DIVERTED FOR DIFFERENT PROJECT CATEGORIES

Source: The PRS Blog, 2012

The Forest Conservation Rules (2003) prescribe detailed procedures for the submission of proposals by proponents seeking prior approval of the Central Government (MoEF, 2004). As with the environmental clearance, certain thresholds of impact determine which level of authority is required to process applications. The thresholds are as follows:

- Proposals involving more than 40 hectares of forest land are sent to the MoEF, New Delhi.
- Proposals involving forestland up to 40 hectares are sent to the concerned regional offices of the MoEF. These offices are situated at Shillong, Lucknow, Chandigarh, Bhopal, Bhubaneswar, Dehradun and Bengaluru.

Beyond these measures, the Regional Chief Conservator of Forests, who heads the Regional Office, has been empowered to take decisions on proposals involving forestland up to 5 hectares. The Central MoEF office in New Delhi, irrespective of the area involved, however, deals with proposals relating to mining or the regularization of encroachment.

The forest clearance process is administratively separate from the environmental clearance process. Firstly in terms of scope, the clearances can be quite different: the environmental clearance is required for the entire area of a project, whereas the forest clearance is only required only for the portion of forested land that will be impacted by a proposed project. Administratively they are also independent of each other, requiring separate proposals and application processes. Since March 2013, there has been a further "delinking" of the two processes, resulting in part from complaints from both public authorities and private companies about excessive time delays in sequentially garnering the various clearances. Under the newest regulations, developers can now apply simultaneously for forest clearance and environmental clearance as opposed to waiting to secure the forest clearance ("Stage 1") before making an application for environmental clearance to the SEAC/EAC (MoEF, 2013a). However where both the forest and environmental clearances are required, proof of application for forest clearance must be submitted with the environmental clearance application (Indian Roads Congress, 2013).

Importantly, however, the granting of the environmental clearance does not necessarily imply that forestry and wildlife clearances have been granted to the project. The proposals for forestry and wildlife clearances are considered and decided on by the respective authorities on their own merits. In the event that a project developer begins construction based on the granting of the environmental clearance, and in anticipation of the clearance from forestry and wildlife, the project proponent assumes the risk of potential rejection and its related costs, and not the MoEF (MoEF, 2009b).

The forest clearance process has also been simplified over the years for proposals involving:

- Laying transmission lines, pipelines for drinking water supply, laying telephone/optical fiber lines, and exploratory drilling for prospecting of oil, which do not involve felling or cutting of trees.
- Cases involving forest area up to 2 hectares.

Pre-Concession Requirements

i. Adherence to the Clearance Process

To initiate the forest clearance process, project developers are required to make a proposal in the appropriate form (Form A) to the concerned Nodal Officer along with requisite information and documents in advance of taking up any non-forest activity on forest land. Form A requires the provision of the information as outlined in Box 3 below by project proponents.

BOX 3. FORM A REQUIREMENTS

1. Project details:
   - Short narrative of the proposal and project / scheme for which the forest land is required.
   - Map showing the required forestland, boundary of adjoining forest on a 1:50,000 scale map.
   - Cost of the project.
   - Justification for locating the project in forest area.
   - Cost–benefit analysis (to be enclosed).
   - Employment likely to be generated.
2. Breakdown by use of the total land required.
3. Details of displacement of people due to the project, if any:
   - Number of families.
   - Number of Scheduled Castes/Scheduled Tribes families.
   - Rehabilitation plan. (To be enclosed)
4. Whether clearance under Environment (Protection) Act, 1986 required? (yes/no).
5. Undertaking to bear the cost of raising and maintenance of compensatory afforestation and/or penal compensatory afforestation as well as cost of protection and regeneration of Safety Zone, etc. as per the scheme prepared by the State Government (undertaking to be enclosed).
6. Details of Certificates/documents enclosed as required under the instructions.

Source: MoEF, n.d.d.

In undertaking Form A all user agencies (following a 2011 MoEF circular) seeking forestland for non-forest activities are required to submit geo-referenced digital data prepared by using "total station" (or differential) GPS. The digital mapping of the area can also be done by the forest department by realizing appropriate costs from the user agency, if the user agency wishes to do so.

After the initial proposal has been submitted, and as per the Forest Conservation Rules (2003), the forest clearance process essentially involves two key stages:

Stage I, in-principle approval: *A prima facie* review of the proposal is either accepted or rejected, based on the recommendations of the Forest Advisory Committee (FAC) within the MoEF. As mentioned above, different authorities depending on thresholds of forestland diversion, assess proposals, as follows:

- *Up to 5 hectares:* the Regional MoEF Offices is empowered to issue a clearance.
- *5 to 40 hectares:* a State Advisory Group (SAG) in the concerned State/UT examines proposals in collaboration with the Regional MoEF Offices. The decision is then taken in the MoEF, New Delhi on the basis of the recommendations of the SAG.
- *More than 40 hectares:* the Forest Appraisal Committee (FAC) in the MoEF, New Delhi, examines the proposal and makes a decision.

The in-principle, or Stage 1, approval is subject to compliance with certain conditions, as expanded upon below, which relate largely to the payment of the appropriate opportunity costs and expenses towards mitigating environmental damages (Choudhary et al., 2009). Prominent conditions that project proponents are required to satisfy include 1) a quantification of net present value (NPV) of the forest area, 2) a deposit on the costs of compensatory afforestation, 3) the cost of penal compensatory afforestation and 4) paying "other expenses" for mitigating environmental damages.

Stage II, formal approval: Final approval depends on compliance with the conditions of Stage I approval above. The central government issues the final clearance, and only after this clearance can the state government pass an order notifying the diversion of forestland. Ground-level activity for implementation of the project cannot be started until final clearance is issued. Furthermore, only after this point can the National Green Tribunal (NGT) intervene in the process, by filing an appeal against the order of forest clearance (The PRS Blog, 2012).

ii. Compliance with Conditions

Whenever clearance (i.e., Stage I) is accorded to a project for diversion/ de-reservation of forestland under the provisions (i.e., Section 2) of the Forest Conservation Act, several conditions to minimize impact on forestland are imposed by MoEF. These conditions include "General Conditions," "Standard Conditions" and "Specific Conditions" which are stipulated to keep in view the impact of the project on Indian forestland. Examples of a "general condition" would be the requirement that the legal status of forestland remains unchanged and that compensatory afforestation be carried out. The term "standard conditions" refers to sector-specific requirements. For roads and highways, for instance, this would relate to a specified "strip plantation" model to minimize the felling of trees. Specific conditions would arise on a case-by-case basis (Indian Roads Congress, 2013). Other conditions might stipulate a catchment area treatment plan, a wildlife habitat improvement plan and/or a rehabilitation plan to mitigate effects of the diversions.

BOX 4. SAMPLE CONDITIONS OF STAGE 1 FOREST CLEARANCE (EXAMPLE FROM A ROADS PROJECT)

1. The legal status of the forestland shall remain unchanged.
2. The compensatory afforestation shall be taken up by the Forest Department over 20.90 ha. Degraded forest land (Survey No. 275 village- Khintala Taluka- Sayla, District- Surendranagar) at the cost of the project authority, within two years of the issue of this letter.
3. Avenue Plantation shall be raised on either side of the road at the cost of the project.
4. Necessary clearance shall be obtained from Ministry of Environment and Forest, New Delhi as required under Environment impact Assessment Notification, 1994 if the road is to be tarred.
5. The forest land shall not be used for any purpose other than that specified in the project.
6. Any other condition, which the State Government may stipulate from time to time.

Source: Government of Gujarat: Forests and Environment Department, 2004

In addition to the conditions stipulated by the Central MoEF as above, the State Forest Departments may impose supplementary conditions. For instance, the extent of compensatory afforestation (see below) is an example of where conditions vary greatly from state to state. According to the *India Infrastructure Report* (2009, p. 64) these additional conditions imposed by the state can be unreasonable and difficult to meet and contribute to the delays in securing final Stage II approval, which developers require in order to officially commence construction.

iii. Compensatory Afforestation, Penal Compensatory Afforestation & Other Expenses

Compensatory afforestation (CA) is one of the most important conditions stipulated by the central government while granting forest clearance approval. The Forest Conservation Act (1980) provides a detailed compensation scheme along with details of non-forest/degraded forest areas identified for CA, with the objective of ensuring that project authorities requiring diversion of forestland for other uses have to pay the appropriate opportunity cost of the land being diverted. Proposals submitted require an accompanying CA plan.

The Compensatory Afforestation Management and Planning Authority (CAMPA) has been established to monitor the effective implementation of the CA, with a cell in the MoEF to monitor the movement of proposals at various stages and the compliance of the conditions stipulated in the forestry clearances by the user agencies (MoEF, n.d.e). A National CAMPA Advisory Council oversees the policy as well as monitoring and evaluation of state-level schemes.

The state-level CAMPA authorities (State CAMPAs) implement the afforestation activities. These entities are the custodians of funds collected for the implementation of CA, and/or any other money from user agencies towards compliance of conditions (Stage I Approval). State CAMPAs have been charged with the task of "accelerating activities for preservation of natural forests, management of wildlife, infrastructure development in the sector and other allied works" (MoEF, 2009c). In this and other ways, the state government plays an important role in undertaking the groundwork for the compensatory afforestation plan.

In order to estimate the amount of CA required for a given project, project proponents must submit a net present value (NPV) of the forest area being cleared with Form 1 of the forest clearance application (see Box 3). This exercise aims to quantify the environmental services provided for the forest area that is to be diverted to non-forestry use. NPV is determined according to a formula by the central government via expert committees. NPV for forests falling into different "eco-values" are given, as found in Table 2 below.

TABLE 2 GOI METHOD FOR QUANTIFYING NPV FOR COMPENSATORY AFFORESTATION

TYPE OF FOREST	ECO CLASSES	NPV OF VERY DENSE FOREST (PER HA)	NPV OF DENSE FOREST (PER HA)	NPV OF OPEN FOREST (PER HA)
Tropical Wet Evergreen Forests	Eco-Class I	INR 1,043,000 (~US$16,970)	INR 939,000 (~US$15,277)	INR 730,000 (~US$ 11,877)
Tropical Semi-Evergreen Forests				
Tropical Moist Deciduous Forests				
Littoral and Swamp Forests	Eco-Class II	INR 1,043,000 (~US$16,970)	INR 939,000 (~US$15,277)	INR 730,000 (~US$11,877)
Tropical Dry Deciduous Forests	Eco-Class III	INR 887,000 (~US$14,431)	INR 803,000 (~US$13,065)	INR 626,000 (~US$10,185)
Tropical Thorn Forests	Eco-Class IV	INR 626,000 (~US$10,185)	INR 563,000 (~US$9,160)	INR 438,000 (~US$7,126)
Tropical Dry Evergreen Forests				
Sub-Tropical Broad Leaved Hill Forests	Eco-Class V	INR 939,000 (~US$15,277)	INR 845,000 (~US$13,748)	INR 657,000 (~US$10,689)
Sub-Tropical Pine Forests				
Sub-Tropical Dry Evergreen Forests				
Montane Wet Temperate Forests	Eco-Class VI	INR 991,000 (~US$16,123)	INR 897,000 (~US$14,594)	INR 699,000 (~US$11,373)
Himalayan Moist Temperate Forests				
Himalayan Dry Temperate Forests				
Sub Alpine Forests				
Moist Alpine Scrub				
Dry Alpine Scrub				

Source: Indian Roads Congress, 2013.

In addition to CA, penal compensatory afforestation (PCA) covers afforestation work to be done above and beyond the prescribed CA in lieu of the extent of area over which non-forestry activities have been carried out without obtaining prior approval of the competent authority under the Forest Conservation Act. Finally, the other general conditions to a Stage 1 forest clearance might include "other expenses" related to the mitigation of environmental damages including catchment area treatment, wildlife preservation, biodiversity conservation and rehabilitation of displaced persons, if any (Indian Roads Congress, 2013).

Post-Concession

In June 2013, a Committee under the Director General of Forests (Forest Conservation) issued a *Draft Policy on Inspection, Verification Monitoring and Overall Procedure Relating to Grant of Forest Clearance and Identification of Forests* ("Draft Policy"). At the time of writing, the Draft Policy is under internal review in the MoEF, since it has closed the document's period of external review and comment.

The Draft Policy responds to the clear absence of post-concession requirements related to the forest clearance. In no unclear language, the Committee laments, "monitoring is the weakest link in the entire forest clearance process" (MoEF, 2013b). Furthermore the Committee calls for "an effective system for monitoring of compliance to conditions stipulated in the approvals accorded under the Forest Conservation Act, by the user agency as well as the concerned state/UT government" and a "transparent, effective and unbiased system to facilitate expeditious follow-up action in case of non-compliance/violation of stipulated conditions" (MoEF, 2013b).

Current guidelines specify that monitoring of compliance with stipulated conditions should occur every five years, and violation or non-compliance can result in the withdrawal of the forest clearance. Nodal Officers from the MoEF Regional Offices are obliged to monitor the compensatory afforestation implementation and report to the Central Government for matters concerning land (e.g., on the survival ratio of seedlings) and the funding (releasing of funds from State CAMPAs). The Draft Policy, however, strongly recommends enhanced monitoring by users, the State government, as well as the Regional MoEF offices. Recommendations from the Draft Policy include:

- Annual self-monitoring reports will be prepared by user agencies (i.e., project developers or, in the case of roads, the NHAI) and will be submitted to the competent authority.
- State governments will monitor the diversion of land within their jurisdiction with a frequency as laid out by the Draft Policy (yearly for all projects during the construction period and once every two or three years thereafter).
- Regional offices of the MoEF will monitor regularly, with a minimum frequency as determined by the *Draft Policy* and depending on the sector/ category of the project.
- In the case of non-compliance noted through the above channels, the state government is to be alerted and is to take immediate action to ensure compliance with the stipulated condition.
- If serious adverse impacts on the environment and flora/fauna are observed, the regional office can initiate action within seven days—submitting a letter to the FAC at the MoEF—to determine the status of the forest clearance.
- The hiring of a full-time officer, not below the rank of Deputy Conservator of Forests, to assist the regional offices in monitoring of compliance to conditions and to ensure timely reporting.
- The Ministry will prepare a panel of accredited institutions/individual experts to monitor compliance to conditions stipulated in the approvals. Through a systematic random sampling method, projects to be monitored during a month are selected and communicated to affected institutions. It is however unclear whether the monitoring agencies will function independently, and/or to what degree, the costs incurred for this exercise, etc.
- Government shall establish an independent remote sensing satellite based monitoring system to detect encroachment, unauthorized change, illegal mining, and the creation of GIS based decision support database shall be put in place for authorities to be able to compare and cross check information provided in forest clearance proposals.

Certainly the Draft Policy lays out some rigorous reporting requirements. The question is, however, what the impact of such a multitude of entities responsible for routine reporting will be. It may run the risk of creating too many watchdogs, and the implementation of these measures may lead to additional "box-ticking" exercises without providing additional value-added safeguards for the protection and conservation of forests in India. The following section identifies some ongoing concerns related to the forest clearance process that suggest reasons why VfM is not being achieved under the current regulatory framework.

Analysis

i. Land records and the demarcation of forestland are outdated, leading to confusion and to delays in issuing the clearances.

Unlike the requirements for obtaining an environmental clearance, the forest clearance process does not require project proponents to conduct and submit an impact assessment report. This has led to concerns from NGOs that forest clearances are being granted without considering the impacts of forest diversion on biodiversity, wildlife, water and on local communities (CSE, 2011). Furthermore, there is a heavy reliance on land records to verify the claims made in Form A, but the accuracy of these records—upon which the Stage I forest clearance is granted—is questionable (IDFC, personal communication, Aug. 29, 2013). There is a wealth of anecdotal evidence to suggest that some areas of dense forest cover are not officially designated as forest in government records, and other barren lands have incorrectly been recorded as such.

This concern relates to the issue of how to correctly identify forestland. The Forest Conservation Act (1980) and the Forest Conservation Rules (2003) do not themselves contain anything on the identification of forests (MoEF, 2013b). The Supreme Court of India, through several petitions, has tried to address this gap through a call to define forests according to dictionary definitions and irrespective of other political/legal interpretations, and has called for the correct identification of zones. Standing committees were established to ascertain the demarcation of the land (i.e., if it is forest land or not). Even so, however, project developers still complain that forestland is wrongly labelled as such.

Noting this challenge, the new Draft Policy also makes recommendations in this domain. It calls for the definition to rest on an appropriate combination of objective parameters, and suggests: 1) stand density (number of trees per hectare) 2) crown density (percentage of foliage density) 3) minimum extent of contiguous forested area 4) the nature of the vegetation and 5) the origin (human-made or naturally grown). Geo-referenced district forest maps are recommended to complement the identification above, and serve as a tool for comparing/contrasting forest clearance applications, and review progress in relation to these maps. This is one of the more useful and concrete contributions the new Draft Policy proposes, as establishing and standardizing forestland records would serve to make the forest clearance process more transparent and efficient for all parties, and to ensure rates of deforestation are being checked.

ii. The compensatory afforestation scheme faces implementation challenges

A major concern related to the forest clearance process is the persistent backlog in executing the conditions stipulated in the Stage I approval, particularly the realization of the compensatory afforestation mechanism. The CAMPA funds have accumulated an unutilized surplus of approximately INR **25,000 *crore* to date** (over US$4 billion) (MoEF, 2013b). Similar unused surpluses have also been noted in the states.

One explanation for such unused surplus has been that commensurate non-forest land is not being made available for taking up CA activities. So far, only 47 per cent of the forest diverted for non-forest purposes is rehabilitated as forest. This is the cause of much resistance from NGOs, environmentalists, and wildlife experts (C.D. Singh, 2009). While inefficiencies in the CA scheme may be partly to blame, it is also possible that there is a physical lack of degraded, barren land that might qualify for afforestation activities. In the State of Goa, for instance, a state with relatively good forest cover, identifying sufficient degraded land is not always obvious (Herald Goa, 2013).

It is also clear that additional conditions to Stage I clearance propagated by states, as well as the FAC's conditionality, have led to confusion. In order to prevent situations where difficult-to-implement conditions are imposed by state governments, the MoEF could consider the issue of uniform policy guidelines on the nature of additional conditions that may be prescribed by the state governments. This, in addition to an institutional mechanism for transferring funds expeditiously and efficiently, needs to be put in place.

iii. The Supreme Court's Role in Forest Conservation in India

Through its various judicial orders and clarifications, the Supreme Court of India has helped, and in some cases forced, the GoI to take appropriate necessary actions toward better management and protection of the forests. One example would be the Honourable Supreme Court of India's petition concerning the interpretation of the definition of "forest," which served to widen the scope of the applicability of this Forest Act and introduced the system of net present value (NPV) of the forest and the functioning of Compensatory Afforestation Fund Planning and Management Authority (CAMPA).

iv. There are concerns that forest clearances are being issued unchecked.

According to the Centre for Science and the Environment (CSE) New Delhi, the issuance of forest clearances by the MoEF reached an unprecedented rate during the 11th 5-year plan (2007–2011). During this period, more than 8,000 projects were granted forest clearance culminating in a diversion of 20,400 hectares of forestland. The CSE laments the fact that since 1981 25 per cent of all forestland in India has been diverted for development projects (CSE, 2011). A website run by the CSE called the Green Clearance Watch[8] actually tracks and monitors clearances on a sector-by-sector basis. What they have found is that, contrary to popular discourse on infrastructure projects being "held up" by the MoEF, clearances are actually being issued at unprecedented rates and indeed exceed the number of projects that actually come to fruition in terms of making it to construction and operation phases.

v. Project proponents express frustration over long delays in obtaining MoEF clearances.

Delays in obtaining necessary clearances/approvals lead to time and cost escalation for project developers—whether it be to clear the way for a new highway, port, thermal power plant or airstrip. Often it takes up to three years to obtain the necessary clearance(s). Since the forest clearance is granted in two stages—first the "in-principle" approval that stipulates certain conditions, and then final clearance issued after fulfillment of all the conditions—ground-level activity for the implementation of the project is technically held up (as are the funds) until final clearance is issued (Singh, 2009). To address this concern, the MoEF has issued

[8] See: www.greenclearancewatch.org.in

several guidelines/clarifications under the *Forest Conservation Act* (1980) and the *Forest Conservation Rules* (2003), particularly for road and highway projects, to expedite some processes (Indian Roads Congress, 2013). In addition, the Cabinet Committee on Investment as mentioned in Section 2 has the authority to override all clearances processes, including the forest safeguards.

vi. There is widespread apprehension about the proposals made in the new Draft Policy.

The proposals made in the June 2013 *Draft Policy on Inspection, Verification, Monitoring and Overall Procedure Relating to Grant of Forest Clearance and Identification of Forests* have raised criticisms from a broad array of stakeholders: from environmentalist groups to experts, industry leaders, investors and concerned individuals. Some investors are concerned that there are too many proposed layers of reporting and that it is both unfeasible and undesirable to create this multiplication of reporting tasks. It was revealed during interviews for this project that the nature of the forest clearance itself is and should be a *fait accompli* at the time of the issuance of the Stage 2 approval, and that it remains the duty of the regulators to enforce the CA and other standards and stipulations, not the duty of the "user agencies."

There is also a distinct lack of direction on punitive actions for non-compliance. While one might assume this to be the primary objective of the Draft Proposal, there is scant mention of the type and scale of retribution officers may face for blatant failure to meet forest-clearance conditions. At present, there are scarcely any examples of instances where punitive action has been taken—such as the cancellation of the forest clearance—although this may slowly be changing with the establishment of the NGT. Prosecution of officers seldom occurs, and, moreover, lax implementation can gradually become normalized. The new Draft Policy fails to plug this hole.

There are also concerns about the credibility of the third parties proposed to monitor compliance with Stage 1 forest-clearance conditions. The MoEF has suggested a panel of accredited institutions/individual experts to monitor compliance with conditions stipulated in the approvals, but the worry is that outsourcing to independent "third parties" will require that the credibility of these panels will also need to be scrutinized and their recommendations monitored. Thus the responsibility will ultimately remain with the MoEF to ensure on-the-ground compliance with these conditions, such as compensatory afforestation, catchment rehabilitation and reporting (Anil, 2013). Enhancing the capacity of the MoEF regional offices to do so may thus be a more effective approach.

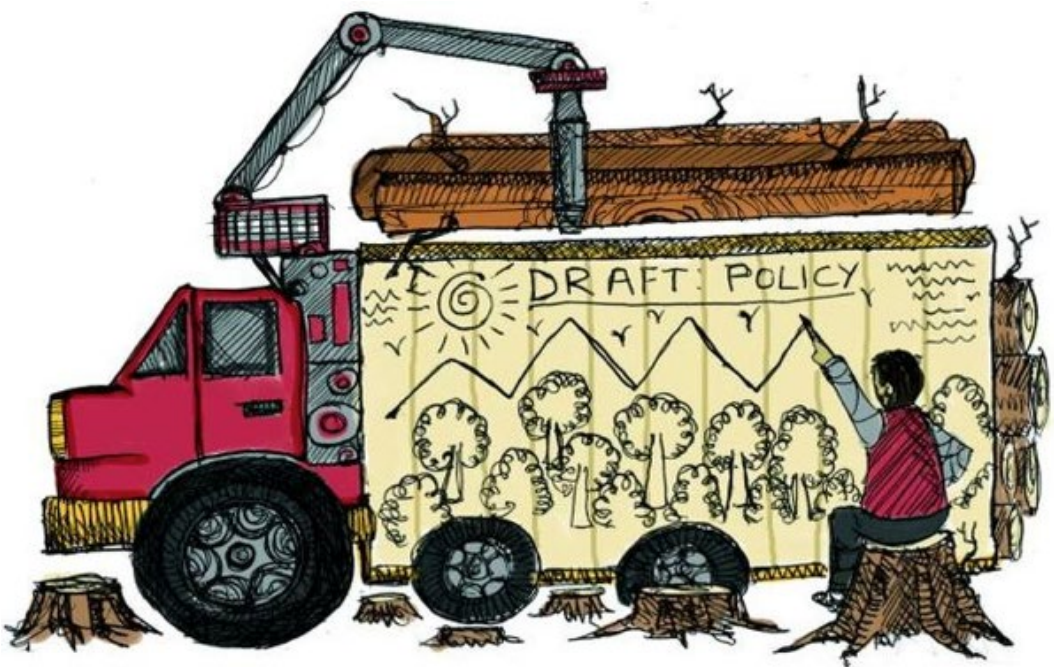


FIGURE 12 CARTOON COMMENTARY ON THE NEW DRAFT POLICY ON INSPECTION, VERIFICATION, MONITORING AND OVERALL PROCEDURE RELATING TO GRANT OF FOREST CLEARANCE AND IDENTIFICATION OF FORESTS

Source: Bhargava, 2013.

Concerned environmentalists have also pointed out that the new Draft Policy fails to address a more technical issue, namely the continuous fragmentation of forest land into smaller patches. The implementation of the CA does not rigorously require states to consider the contiguousness of forestland, instead focusing more on the total coverage to be replanted, which is considered ecologically unsound practice. Praveen Bhargava, from the NGO Wildlife First, argues that such forest fragmentation "disrupts landscape connectivity, creates new edges, depletes biological integrity and affects the stability of entire ecosystems" (Bhargava, 2013). Breaking up large forests threatens long-term biodiversity and forest conservation. Although there exists a clause in the current policy favouring afforestation of continuous forest land, environmentalists have noted how this clause has been "cleverly bypassed" in the new Draft Policy (P. Bhargava, 2013).

3. WILDLIFE CLEARANCE

Introduction to the safeguard

Wildlife in India is threatened by economic expansion, competition for resources, and associated loss in protected habitat (Wildlife Conservation Society, n.d.). Although wildlife protection efforts in India are supported by a strong legal and constitutional framework, a proactive civil society sector, and their cultural significance, there has still been a marked decline in habitat in recent decades, particularly for the tiger, rhino and lion. According to the National Wildlife Database, there are currently 520 wildlife sanctuaries in India covering an area of 121,980 square kilometres, or 3.71 per cent of the country (The Wildlife Institute of India & the MoEF, 2013).

> India's diverse landscapes are home to numerous threatened and critically endangered species, including the Asiatic lion, Asian elephant, tiger, white-rumped vulture, Asian one-horned rhinoceros, and water buffalo. Many species of deer, antelopes, wild dogs, cats, and bears also live here. Resident primates include macaques, the hoolock gibbon, slender and slow lorises, and the golden langur—one of the world's rarest monkeys. Besides mammals, there is a vast and diverse array of reptiles, amphibians, and birds, some of which are still unknown to science.
>
> Wildlife Conservation Society, India (n.d.)

The Wildlife Protection Act (1972) governs wildlife protection in India and contains certain procedures for undertaking non-forest activities in wildlife habitats. The National Board for Wildlife (NBWL) is the main institution managing the clearances. According to this (and related legislation), project proposals that are located within a 10-kilometre buffer zone of reserved wildlife habitat must seek the prior recommendations or approvals of the Supreme Court of India, the State Board for Wildlife (chaired by the State Chief Minister) and/or the Standing Committee of National Board for Wildlife (chaired by the Minister in charge at the MoEF) (MoEF, 2011).

The procedure for acquiring wildlife clearance is closely linked to the process of acquiring an environmental clearance. Any project that requires an environmental clearance or forest clearance that is located within the eco-sensitive zone around a national park or wildlife sanctuary (NP/WLS) or in absence of delineation of such a zone, within a distance of 10 kilometres from its boundaries, the user agency/project proponent is required to obtain recommendations from the Standing Committee of NBWL. This should be obtained *prior* to environmental clearance. The granting of the environmental clearance does not, however, necessarily imply that forestry and wildlife clearance will be granted to the project; they will be awarded separately by their respective authorities based on merit (MoEF, 2009d).

The relevant authorities are as follows:

- Projects located in or near wildlife sanctuaries that endanger either wildlife or its habitat must obtain the recommendation of the State Board for Wildlife and the Standing Committee of the National Board for Wildlife (a committee chaired by the MoEF Minister).
- Projects located in or near national parks that endanger either wildlife or its habitat, must obtain the recommendation of the National Board for Wildlife (a board chaired by the Prime Minister).

Pre-Concession Requirements

The procedure for obtaining a wildlife clearance (i.e., the recommendation of the Standing Committee of the NBWL) requires the user agency/project proponent to submit a detailed proposal. The prescribed procedure has five parts—each with associated forms—that are submitted as part of the complete application (Sharma & Choudhary, 2009). In Box 5 below, the forms for Part I to V are presented, including their contents and the entity responsible for completing them.

BOX 5. ELEMENTS OF THE WILDLIFE CLEARANCE APPLICATION

SECTION	RESPONSIBLE ENTITY	SAMPLE OF CONTENT
Part I	Applicant / Project Proponent	• Aims of the proposed project • Location and map of area required • Whether vegetation will be cleared. If yes, how much (in hectares)? • Opinion of authorities (separate letter to be submitted from Chief Wildlife Warden for instance)
Part II	Applicant / Project Proponent	• Project details (location, size, vegetation etc.) • Copy of Investigation and Survey Report • Map showing boundaries of the NP/WLS • Report on existing alternatives sites; technical and financial justification for opting for NP/WLS area instead • Biodiversity Impact Assessment • Details of the area required • Details of displacement of people, if any
Part III	Officer in charge of the Sanctuary/ National Park under consideration and to be submitted within 30 days of receiving Part II	• Total area of park/sanctuary & total area of diversion required • List past projects and area diverted • List positive impacts due to diversion (of projects listed above) • List negative impacts due to diversion (of projects listed above) • Management plan period • Location of proposed area with regard to wildlife • List likely positive & negative impacts of proposed project • Whether authorities have ever committed violation of Wildlife Protection Act (1972) of Forest Conservation Act (1980). If yes, provide details of offense and current status. • Comments on a) Biodiversity Impact Assessment and b) Alternative sites assessment • Dates and duration of field visits to the proposed site • Agreement on site selection being viable and best/only option
Part IV	Chief Wildlife Warden, within 15 days of receiving Part II and III	• Opinion (and justification) on information and recommendations from Part III • Have you visited the site? • Do you agree it is the best or only option and is viable? • Specific comments • Do you recommend the project? • Conditions, if any, to be ensured in the interest of wildlife
Part V	Department in charge of Forestry and Wildlife in consultation with State Board for Wildlife within 30 days of receipt of Part IV.	• Agreement of recommendations of Chief Wildlife Warden. If not, provide reasons. • Confirmation of receipt of Part II, III and IV for State Board for Wildlife • Attach copy of opinion of the State Board for Wildlife • Details and Recommendations of State Government

The proponent authorities are required to seek clearance at two stages: one at the time of surveying the area and then for obtaining the final clearance. The detailed process for obtaining Stage I clearance is outlined in Box 6 below.

BOX 6. PROCESS OF OBTAINING WILDLIFE CLEARANCE

1. Submission of application by project proponents to the Wildlife Warden of the district.
2. Independent examination of the proposal by Chief Wildlife Warden of the state.
3. Scrutiny and examination by the State level Wildlife Advisory Body.
4. After recommendation by the State Wildlife Advisory Body, the case is forwarded to National Board of Wildlife (NBW).
5. Consideration of the proposal by NBW; (vi) After recommendation by the NBW, the proposal is forwarded to the Supreme Court of India, which refers it to the Central Empowered Committee (CEC) constituted by the Supreme Court to advising the matter of environment, forest, and wildlife.
6. After receipt of approval from the Apex Court, the proposal is processed by the state government if no forest land is involved for issue of the government order.
7. The proposal is thereafter submitted to the Central Government, if forest land is involved for consideration under the Forest (Conservation) Act, 1980 and to grant Stage I approval.

Post-Concession Requirements

Similar to the forest clearance, the wildlife clearance does not have any particular requirements in the post-signing of the concession stage. The nature of the clearance is therefore pre-emptive and seeks to ensure project proponents have a) considered the possibility of alternative, less-sensitive zones and b) chosen the site in light of the potential positive and negative impacts.

Analysis

i. A recent court case highlights a gap in the current "buffer zone" system

In October 2013, the Supreme Court heard a mining case in the State of Goa related to the issue of wildlife clearances, and its proceedings have raised an important comment on the current framework for wildlife clearances. A cluster of mining lessees argued why and how it was legal for them to be mining within one kilometre of wildlife sanctuaries. Justice A.K. Patnaik brought to the court's attention the need to consider not only the distance of the buffer but the type of industrial activity that will be undertaken. As opposed to taking a site-specific approach, it was highlighted that an activity-specific approach should be considered as well: for example, whether the proposed activity is building a road, habitation, or a power plant. The court observed that the "[b]uffer zone must be connected with the activity you are doing; whether it is a nuclear plant or whether it is blasting" (De Souza, 2013).

ii. Diverse stakeholders have recommended further streamlining of the wildlife clearance, forest clearance and environmental clearance.

To avoid duplication, reduce the time required, and generate a more comprehensive project profile, diverse stakeholders, ranging from investors to environmentalists, have proposed streamlining the clearance process. In effect, during the time of preparation of the detailed project report (DPR), all environmental, forest and wildlife concerns could be taken into consideration and then processed simultaneously. The three respective clearances, all statutorily required, could be processed simultaneously under the relevant Acts or Notifications (Sharma & Choudhary, 2009).

4. LAND ACQUISITION AND RESETTLEMENT

Introduction to the safeguard

Land acquisition may be referred to as the *forcible acquisition of land from an unwilling seller* and is to be differentiated clearly from a land purchase from a willing seller (Gangwani, 2011). PPP infrastructure projects often require the acquisition of large plots of land, and this can result in the displacement of large numbers of people and their communities. These projects merit special attention because they may have substantial impacts on the environment. Recently, large transport projects such as interstate highways, have faced challenges related to land acquisition, right-of-way issues, resettlement and rehabilitation of affected people and the obtaining of environmental clearances. A sustainable development approach will require that the developers, planning authorities and government agencies work toward resolving these issues together (MoF, 2008).

Historically, land acquisition in India began with the 1824 Bengal Regulation Act I, which was enacted to promote the commercial interests of the British colonialists. Later, in 1894, the Land Acquisition Act came into effect, initially to acquire land for public purpose. It was subsequently amended in 1962 to allow land to be acquired by the government on behalf of companies engaged in industry or work for public purposes (Sarkar, 2009). This Act governed acquisition of land in India for various projects until recently, when a revised Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (2012) was passed by Parliament in September 2013 (Ministry of Rural Development, 2013). This Act is still awaiting the President's signature to be formally instituted as law.

The Land Acquisition Act (1894) made no reference to resettlement and rehabilitation. The National Policy of Rehabilitation and Resettlement 2007 filled this gap, prior to which there were no legally guaranteed rights to resettlement and rehabilitation, and project-affected people (PAPs) were left to fend for themselves. The new Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (2012) proposes unified legislation for the acquisition of land and adequate rehabilitation mechanisms for all affected persons and is meant to repeal the Land Acquisition Act (1894). The key objective of the new Act is fair compensation, thorough resettlement and rehabilitation of those affected, and also the provision of adequate safeguards for their well-being and complete transparency in the process of land acquisition (The Hindu, 2013).

The key feature of the Act is ensuring that those displaced by purchase of their land are resettled, rehabilitated and compensated at between two and four times the market value of land in rural areas, and up to twice the land's market value in urban areas. In the case of acquisition by private companies, the consent of 80 per cent of residents will be required. The category of "Residents" now includes agricultural labourers, tenants (including any form of tenancy or holding of usufruct rights), and sharecroppers or artisans who have worked in the affected area for three years prior to the acquisition whose primary source of livelihood stands to be affected by the acquisition of land. In cases where land is purchased for public–private partnerships, the consent of 70 per cent of residents will be required. Unlike the Land Acquisition Act (1894), this Act includes provisions for the resettlement and rehabilitation of those displaced by land acquisition by the government. At present, the National Rehabilitation and Resettlement Policy, 2007, governs the process of resettlement (The Wall Street Journal Blogs, 2013).

Pre-Concession Requirements

In the section below, pre-concession requirements for land acquisition are described briefly as per the newly proposed Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (2013) (effect pending); the Land Acquisition Act (1894) that is currently in effect; the National Highways Act (NHA) (1956) which outlines the process of land acquisition for national highways and the National Rehabilitation and Resettlement Policy (2007). The description below is accordingly broken into subsections.

I. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2012:

- The process for land acquisition involves a social impact assessment (SIA), a preliminary notification stating the intent for acquisition, a declaration of acquisition, and compensation to be given by a certain time. All acquisitions require rehabilitation and resettlement to be provided to the people affected. Acquisition of land for use by private companies or public–private partnerships requires the consent of 80 per cent of the displaced people. Purchase of large pieces of land by private companies will require provision of rehabilitation and resettlement (PRS Legislative Research, n.d.).

- This process is not mandatory in cases of defense or national security emergencies, or in the event of a national calamity, or for acquisitions sanctioned by Parliament. In such cases, landowners receive 80 per cent of the price of the land as compensation.
- The government can temporarily purchase land for up to three years, but rehabilitation and resettlement are not mandatory in this case. Companies can negotiate with landowners on the amount of compensation, but it must be between two and four times the market value (in rural areas) and up to twice the market value (in urban land purchases) (The Wall Street Journal Blogs, 2013).

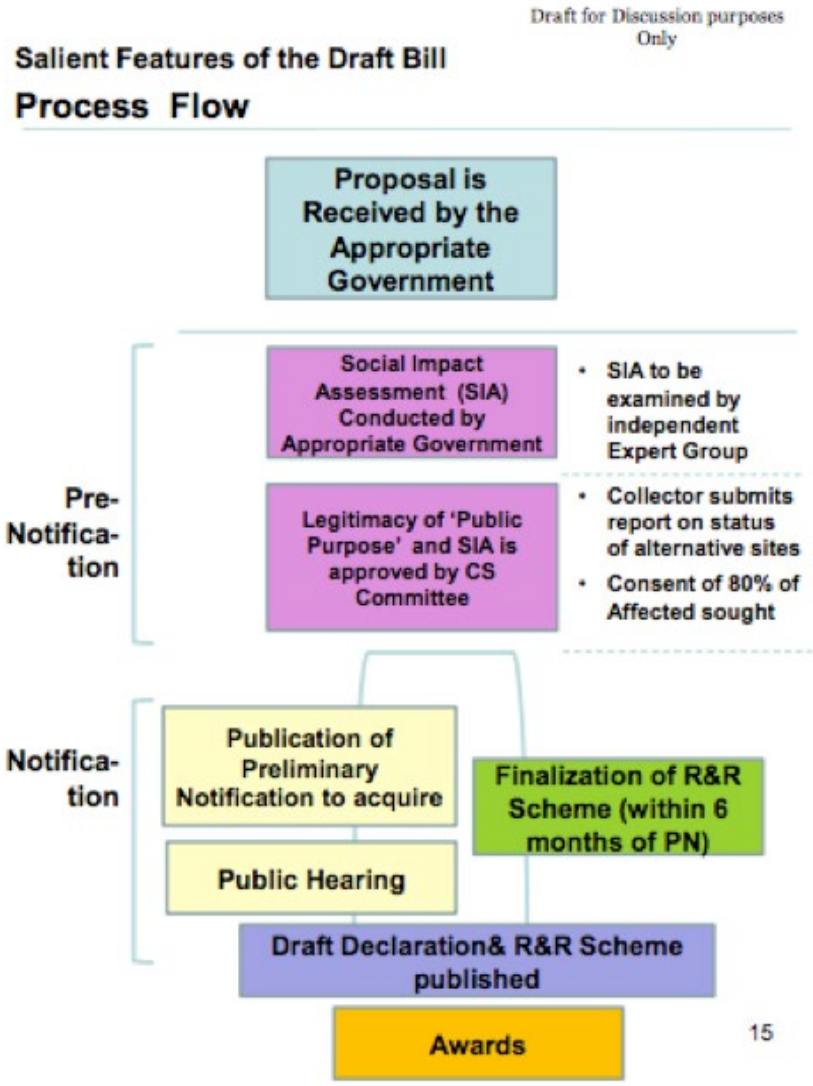


FIGURE 13 PROCESS FLOW, THE RIGHT TO FAIR COMPENSATION AND TRANSPARENCY IN LAND ACQUISITION, REHABILITATION AND RESETTLEMENT ACT (2012)

Source: Ministry of Rural Development, 2011.

In terms of addressing investor concerns the Act also provides for the following (Tehelka, 2013):

- **Consent reduced from 80 per cent to 70 per cent:** In the case of PPP projects, consent has been reduced from 80 per cent to 70 per cent of residents. In addition, only the consent of landowners is required.
- **The definition of "market value" has been amended** to ensure that acquisition price does not form the basis for compensation calculations in future acquisitions. Power has been given to the collector to not consider transactions that might be judged as outliers and thus not indicative of true value when calculating market value. Earlier there was a danger of a price spiral as (a multiple of the) price of first acquisition in an area would go into calculation of land price for any subsequent acquisitions.
- **States given flexibility to fix compensation:** A sliding scale is proposed to give states flexibility to fix compensation in rural areas (between two and four times market value), depending on their distance from urban areas. Earlier compensation in rural areas was to be four times market value.
- **Restrictions on irrigated multi-crop land and net sown area per district (or state) available for acquisition are left to the discretion of states.** Earlier, the amount of irrigated multi-cropped irrigated land that could be acquired was capped at 5 per cent, and the amount of net sown area that could be acquired was also capped.
- **Land-size thresholds on when rehabilitation and resettlement on private purchase of land becomes applicable have now been left to the discretion of states.** Earlier rehabilitation and resettlement on private purchases was to apply to all acquisitions above 100 acres in rural areas and 50 acres in urban areas.
- **Rehabilitation and resettlement provisions** for farmers, landless and livelihood losers include: reduced qualifying to criteria three years of dependence (on the acquired land) instead of five; a choice of annuity or employment; monthly subsistence allowance equivalent to INR 3,000 per month for a period of one year from the date of award; training and skill development while being offered employment and monetary benefits, such as transport allowance of INR 50,000 and resettlement allowance of INR 50,000.
- **The Collector can be the acquiring authority:** The Collector of a district (which may include a Deputy Commissioner and any officer specially designated by the Appropriate Government to perform the functions of a Collector under this Act) can be the acquiring authority in cases where the land sought to be acquired is below a certain threshold.

II. The Land Acquisition Act, 1894 (Choudhary, 2009a):

The Land Acquisition Act (1894) was created with the purpose of facilitating government acquisition of privately held land for public purposes. It was subsequently amended in 1962 to allow land to be acquired by the government on behalf of private companies as well, provided they were engaged in industry or work for a public purpose (Sarkar, 2009). Land can be acquired under either Part II or Part VII of the Act:

- **Part II** is used when land is acquired by the central or state governments or on behalf of a company that is owned, partly owned or controlled by the state (see Figure 12).
- **Part VII** is invoked when land is being acquired on behalf of a non-government company.
- While acquisition under Part II is exclusively meant for "public purpose" projects, acquisition under Part VII can be for both "public purpose" as well as "non-public purpose" (Choudhary, 2009).

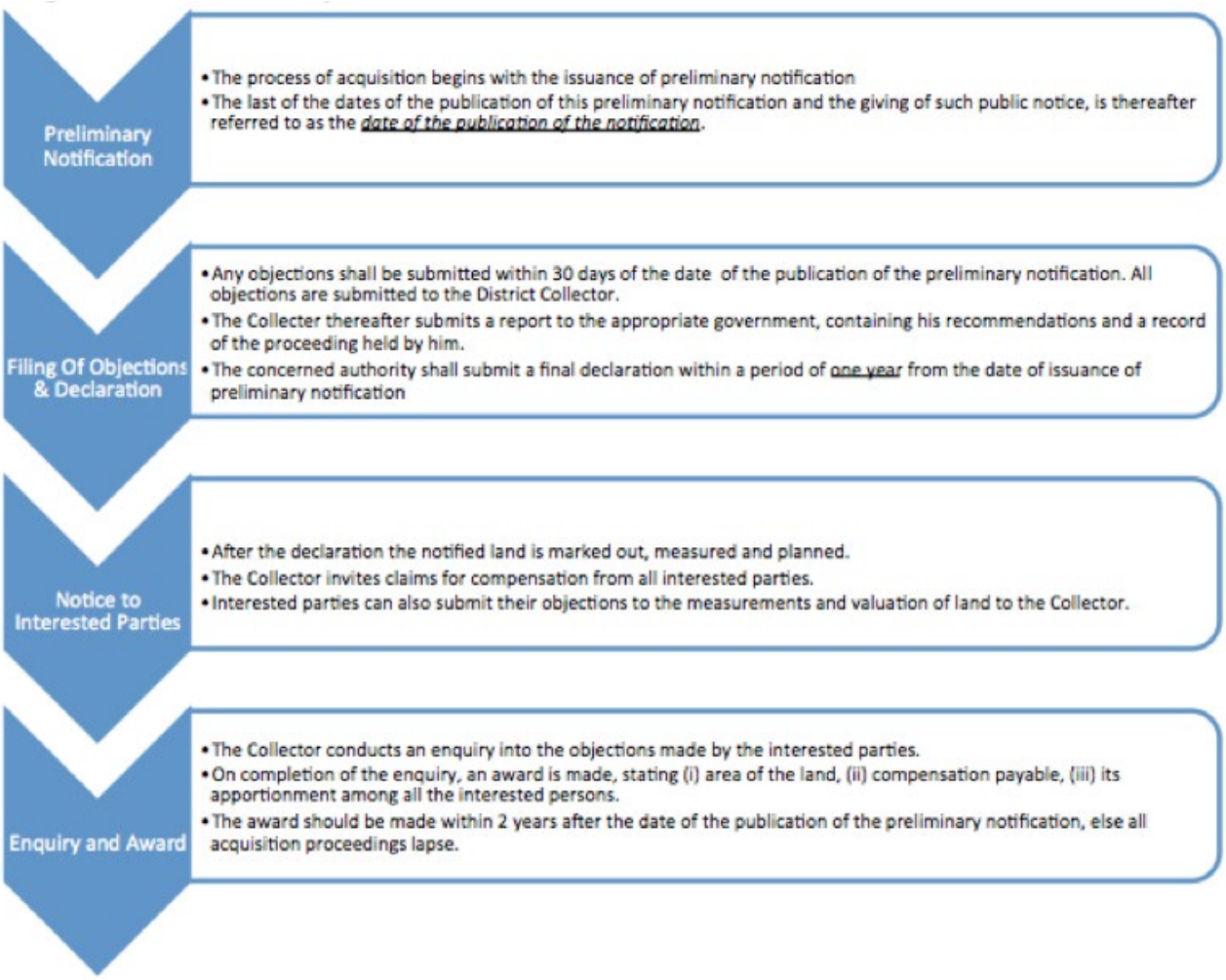


FIGURE 14 PROCEDURE FOR LAND ACQUISITION (AS SPECIFIED UNDER PART II OF THE LAND ACQUISITION ACT, 1894)

Source: Authors' diagram.

Under Part VII: Part VII Purposes, the term "Company" includes companies (as defined by the Companies Act, 1956), societies (registered under the Societies Registration Act, 1860), cooperative societies and industrial concerns owned individually or as a partnership (Choudhary, 2009b).

Acquisition under Part VII can be for the following purposes:

- For building dwelling houses for workers or for providing related amenities.
- For construction of some building for a company that is engaged in any industry or work, which is for a public purpose or is likely to prove useful to the public.

The procedure involved for acquisition of land for companies requires an agreement to be entered into by the company with the appropriate government and the same has to be published in the official gazette. The agreement between a company and the government must include:

- Terms regarding the payment of the cost of the acquisition of land to the appropriate government.
- Terms regarding transfer of land to the company on such payment.
- Terms on which the company shall hold the land.

Private companies can also acquire land through the urgency provision. However, such acquisitions can only be made for a "public purpose."

III. The National Highways Act (NHA), 1956 (Sharma & Choudhary, 2009):

A separate law called the National Highways Act (NHA) (1956), provides the process of land acquisition for national highways. By virtue of being linear projects that involve the widening of existing roads and opening of new roads for bypasses, highways projects have a long and narrow corridor of impact. The National Highway Act (1956) provides for acquisition of land for national highways only, and not for the acquisition of land for state highways, which fall under the purview of the Land Acquisition Act (1894).

The Land Acquisition Act (1894) and the National Highways Act (1956) differ in some significant aspects. Some of the points of divergence are as below:

- **Resettlement and Rehabilitation Benefits:** Unlike the Land Acquisition Act, acquisitions under the National Highways Act are necessarily linear in nature. The National Resettlement and Rehabilitation Policy (described below) provides that for such acquisitions of land (including for roads), in addition to the compensation payable under the policy, the concerned authority should also pay an *ex gratia* grant of a minimum of INR 20,000 per affected person.
- **Execution:** Under the Land Acquisition Act, acquisition is to be handled by the revenue department, that is, the District Collector and his or her staff of land record keepers and surveyors. The National Highways Act, on the other hand, appoints a competent authority for this purpose, which may be constituted from within the National Highways Authority of India (NHAI) or appointed at the district level, usually the revenue department.
- **Time limit:** Under the Land Acquisition Act, the Collector is required to award the land within a period of two years from the date of publication of the declaration and, if no award is made during that period, the entire proceeding of the acquisition of land lapses. No such time limits are imposed under the National Highways Act and possession can be taken at any point after the declaration is made by giving a notice of 60 days to the landowner.
- **Urgency Clause:** The Land Acquisition Act has an Urgency Clause, according to which the government can take possession of the land within 15 days of publishing the preliminary notification, without even making the award. There is no such clause in the National Highways Act. Interestingly, this is one of the most controversial of the new Acts' clauses as "urgent need is not defined and is left to the discretion of the acquiring authority (Live Mint, 2013).
- **Compensation:** The Land Acquisition Act provides for solatium amount (30 percent of the market value of land) to those whose land is acquired in consideration for the compulsory nature of acquisition. Besides this, landowners receive a payment of interest (12 per cent per annum on the market value of land) for the period commencing from the date of publication of notification until the award of the collector or the date of taking possession, whichever is earlier. However, no such provision exists in the National Highways Act.

IV. The National Rehabilitation and Resettlement Policy, 2007

The Ministry of Rural Development and the Department of Land Resources formulated the National Rehabilitation and Resettlement Policy (2007). Monetary compensation for acquisition of land was provided as per the Land Acquisition Act (1894); however, it did not make provisions for the rehabilitation and resettlement (R&R) of people displaced as a result of such a land acquisition. In the absence of a legal guarantee and right to resettlement and rehabilitation, the PAPs whose lives and livelihoods were disrupted, were left to fend for themselves. The National Policy of Rehabilitation and Resettlement (2007) sought to fill this gap, and the procedure for undertaking R&R is outlined in Figure 14 below. Key features of the 2007 policy are (Ministry of Rural Development, 2007; Choudhary, 2009):

1. Provisions to minimize displacement and to promote, as far as possible, non-displacing or least-displacing alternatives.
2. The term "Project" has been defined as "any project involving involuntary displacement of people, irrespective of the number of people affected."

3. Emphases to take special care for protecting the rights of disabled, orphans, women, tribes, etc. These provisions include annuity policies that pay a pension for life, resettlement in a compact block (as far as possible), and financial assistance for loss of usage of forest produce for tribes, continuation of the reservation benefits at resettlement sites for scheduled castes and schedules tribes, etc.
4. A social impact assessment (SIA) must be conducted for projects involving the involuntary displacement of 400 or more families *en masse* in plain areas, or 200 or more families *en masse* in tribal or hilly areas, DDP blocks or areas mentioned in the Schedule V or Schedule VI to the Constitution. The SIA report shall be examined by an independent multidisciplinary expert group comprising of (i) two non-official social science and rehabilitation experts, (ii) the secretary/secretaries of the department(s) concerned with the welfare of scheduled castes and scheduled tribes of the appropriate government or his (their) representative(s), and (iii) a representative of the requiring body shall be nominated by the appropriate government to serve on this expert group. The Ministry of Defense, in respect of projects involving emergency acquisition of minimum area of land in connection with national security, may be exempted from the provisions of this Chapter (Ministry of Rural Development, 2007).
5. Provisions for mandatory public hearings at the SIA stage, wide publicity for the survey results and R&R plan, consultations with Gram Sabhas, representation of the affected persons on the R&R Committees, and accessibility for all to the grievance redress mechanisms, ensure that the entire R&R process is transparent and accessible to all.
6. A National Monitoring Committee will monitor the implementation of the R&R process and would be serviced by a National Monitoring Cell.

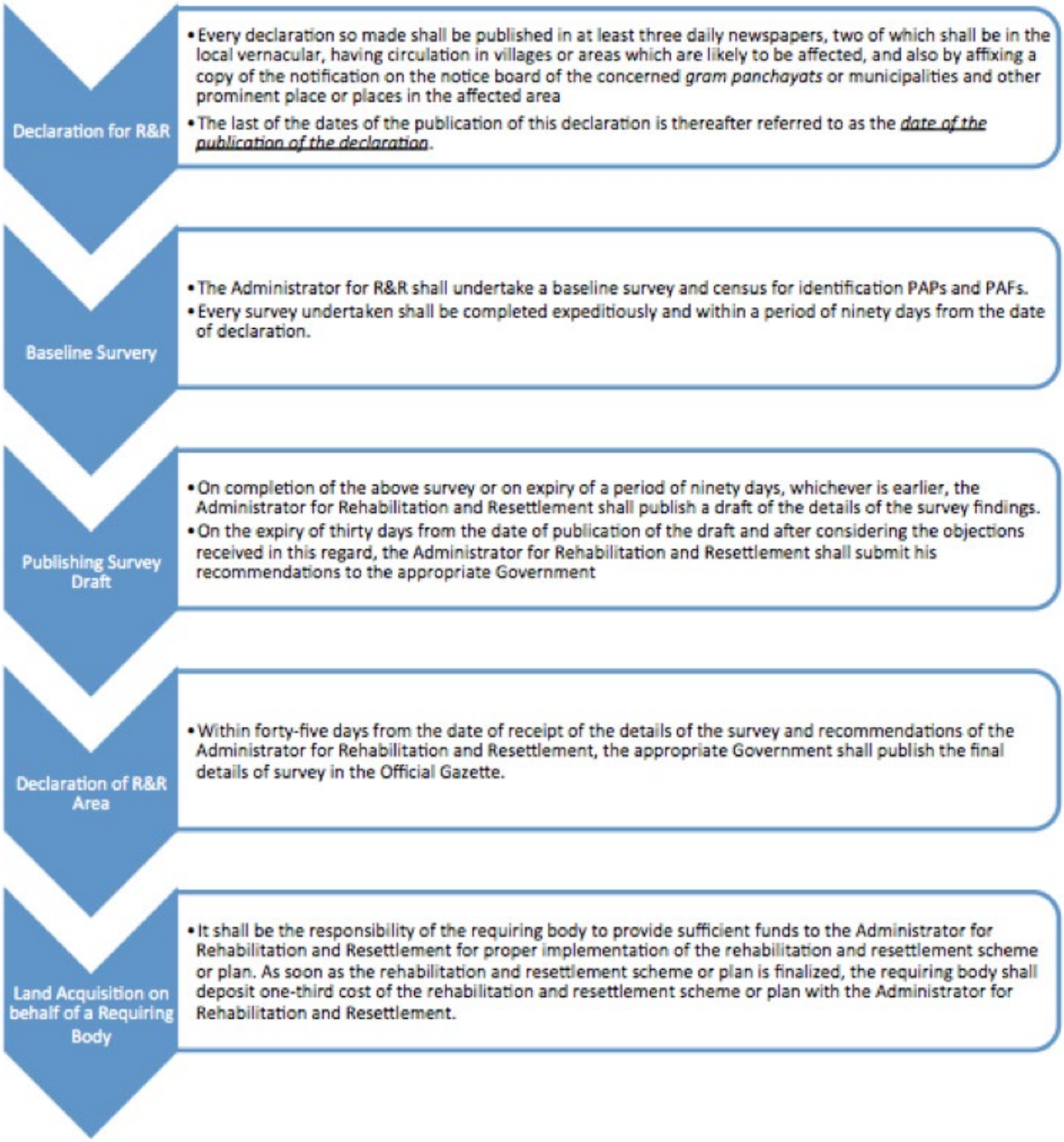


FIGURE 15 PROCEDURE FOR R&R

Source: Author's illustration with information from Ministry of Rural Development, 2007.

Post-Concession Requirements

In the case of a PPP, 70 per cent of the project-affected families must consent to the land acquisition prior to the government using its authority to acquire the land in question. In principle, it is only if and when this is obtained that the R&R process will come into effect. In practice, however, cases arise in which the concession contract will contain a section on *conditions precedent* through which a remaining portion of consent to be obtained will be considered a contingent liability. This allows developers to raise finance for the project in the meantime (IDFC, personal communication, Aug. 29, 2013). This is uncommon, however, and is occurring to a lesser extent in recent years due to perceived and real risks for investors in obtaining land acquisition clearance.

Analysis

i. The new Act (2012) improves upon the century-old Land Acquisition Act (1894)

While not without its critics, the new Land Acquisition, Rehabilitation and Resettlement Act (2012) draws attention to the issue of land acquisition for public purposes. The previous Land Acquisition Act (1984), now over 100 years old, had various shortcomings and needed to be updated to address the PPP model in a more explicit manner. Perhaps most importantly, there were no provisions in the 1894 law relating to the resettlement and rehabilitation of those displaced by the acquisition. The new Act synthesizes these two closely related issues. Some of the notable updates include the following (Tehelka, 2013; Live Mint, 2013):

- Land records: Land acquisition can be particularly difficult for these kinds of projects, as land records in most parts of the country are fragmented and disorganized, often not updated for decades. The new Act proposes to overcome this by ensuring the Collector updates land records and pays up to four times the value to correct any inaccuracies. As analyzed throughout the course of this research, the NCC Sompeta Thermal Power Plant is a case in point. The proposed project site was originally labelled a "wasteland" and not an inhabited and productive wetland, as was actually the case, as was subsequently confirmed by a recent NGT ruling. The project has since relocated.
- Benefits to livelihood losers: In a country where fewer than 10 per cent of citizens are land owners, there is obviously a concern for those who do not hold land title rights but whose lives will be greatly affected by the land-use changes and loss of residence, or livelihood or both. The new Act addresses part of this issue by proposing that livelihood losers are taken care of and not simply displaced through more active resettlement and rehabilitation measures. This marks an improved safeguard as under existing legislation there are no benefits for livelihood losers who are usually far greater in number than the landowners.
- Fair compensation: The Act seeks to instate fair compensation, especially in cases where the State itself has a legitimate need for the acquisition of land to build public goods such as roads, schools and hospitals. The government's role is highlighted as bridging the gap and bringing about balance in the relationship between large-scale corporations and small farmers and other marginalized groups.
- Linking land acquisition and resettlement and rehabilitation: For the first time, land acquisition and the accompanying obligations for resettlement and rehabilitation are connected through one law. It even goes as far as to address historical injustice, applying to cases retrospectively where no land acquisition award was made. In cases where land was acquired five years ago but no compensation paid or no possession has taken place, the land acquisition process will be started afresh in accordance with the provisions of this Act. It also provides that no one shall be dispossessed until and unless all payments are made and alternative sites for the resettlement and rehabilitation have been prepared.
- Safeguards for tribal communities: Special safeguards are also mentioned for tribal communities and other disadvantaged groups wherein land cannot be acquired in scheduled areas without the consent of the Gram Sabhas.
- Participation of the Panchayati Raj: Participation of the local governing bodies such as Panchayati Raj Institutions (PRIs) has been put in place prior to the start of any acquisition proceeding. Monitoring committees at the national and state levels have been established to provide checks that resettlement and rehabilitation obligations are met. The SIA has been revised to be more thorough and is to be carried out in consultation with the representatives of the PRIs.

ii. Project proponents express frustration over long delays while government secures land acquisition.

Land acquisition and issues of R&R, as with other safeguards discussed in this section, have led to what project developers perceive to be costly time overruns in deploying finance and beginning construction. The government itself takes on the task of obtaining the land for PPPs, but the process is political and complex and often exceeds the time and cost estimates of the feasibility studies. Political unrest can be particularly challenging both before and after procurement.

In the case of the Mumbai Metro, for instance, the government committed that the land for the project would be procured as per the land procurement schedule provided in the agreement. However, this land was under private ownership and at times under dispute. This exposed the government to the risk of land not being available, thereby resulting in inordinate delays in commencement of construction of the project. While this issue was eventually resolved, it would have been a better option for the government to deal with it before signing the concession agreement.

Similarly, in the case of the Delhi Gurgaon Expressway project, the government committed to the promoters to provide a substantial area of land before actually acquiring it. Due to the densely populated surrounding areas of the expressway, there were certain pockets of land that proved difficult to acquire. This exposed the government to the risk of not providing the land within reasonable time, thus impacting the overall schedule of the project. Again, these risks would have been better addressed before the project procurement stage itself to ensure smooth functioning of the project, and could have been achieved by completing the land acquisition process prior to the project procurement process itself. This point is taken up in the recommendations section of the report.

SECTION IV

Assessing Sustainability Costs and Benefits

SECTION IV – ASSESSING SUSTAINABILITY COSTS AND BENEFITS

1. SECTION SUMMARY

When assessing whole-life costs as part of value-for-money assessment for infrastructure programs and projects, the externalities to be considered include both positive and negative environmental and social impacts. Using publicly available data on live PPP projects in India, this section provides illustrations of the scale of such potential impacts, drawing on a wide set of accounting concepts also acknowledged within the "National Green Accounts" framework document released by India's Prime Minister earlier in 2013.

- A reappraisal of social and environmental considerations resulted in the cancellation of environmental clearances for one proposed coastal thermal power plant project. Without the cancellation, 306 hectares of coastal wetlands would likely have been destroyed. The global average value of the ecosystem services provided by coastal wetlands of this scale would be approximately **US$4.5 million** every year.
- Valuable mangrove systems were found to be deteriorating rapidly due to two coastal thermal power plant projects located close to each other. Livelihoods were assessed to be under serious threat due to the resulting deterioration in ecosystem services. For example, it was estimated that there had been **80 per cent reduction in value of fishing stocks in less than 10 years**. The global average annual value of the ecosystem services provided by mangroves was estimated in 2006 as **between US$200,000 to US$900,000 per hectare**.
- The widening of one highway was estimated to result in the loss of 60 hectares of forest cover. This loss would result in losses of tens (if not hundreds) of thousands of dollars per year in ecosystem services, and this is without counting the value of the lost timber. Adding the cost of timber and assuming values similar to the average value of forests in Himachal Pradesh, the value would be **approximately US$0.5 million**. Further, there have been audit reports that suggest that the standard compensatory afforestation mechanism is often not implemented correctly.
- The carbon footprint for 128 kilometres of four-laning of a national highway in India has been estimated as 2,115 tonnes carbon-dioxide equivalent (CO_2e) per kilometre. For longer roads such as the 555-kilometre K-U-A highway project, a similar emissions intensity would result in **nearly 1.2 million tonnes of CO_2e emissions**. If all of the 45,000 kilometres of highways projects envisaged in the Twelfth Five Year Plan have this level of emissions intensity, the impact will be **close to 100 million tonnes of CO_2e**. Data from other projects shows that it is possible to make between 3 per cent and 8 per cent carbon reductions through the use of recycled aggregates and cement substitutes; and following the very best practice in material mixing can result in carbon emission savings in this component of over 50 per cent. For highway projects in India covering hundreds of kilometres, following such best practice could result in **carbon dioxide equivalent reductions of hundreds of thousands of tonnes for every project, and millions of tonnes across the highways network**. The greenhouse gas marginal abatement costs of using recycled materials in construction are negative, meaning that cost savings can also be made for all parties involved.

Such potential and actual losses and benefits need to be considered at the earliest possible stages of the PPP decision-making appraisal process, from a whole-life cost and value-for-money standpoint. Where there are risks of potential damages as part of project implementation, PPP procurement needs to reflect these in risk allocations and assess and assign risk values as accurately as possible. For example, risks to people's livelihoods and to the local microclimate from loss of local wetlands are contingent liabilities during the term of the project; while any damages at the end of the project may be reflected in a lower asset value at the point of transfer back to the authority. Such risks should be mitigated in advance of contracting where possible to avoid contingent liabilities to government.

Where there are potential benefits that can be gained as part of (or in parallel with) project implementation, an analysis will need to be conducted to understand if this can be made part of the procurement or if this can be conducted by another party. For example, preservation of mangroves can be made the responsibility of parties independent of the PPP implementation process using a special fund set up as part of the project financing structure.

It is important to note that proxies and assumptions have been used to derive the cost illustrations in this section; and these are likely underestimates since it is impossible to consider all likely cost impacts. For example, the illustrations do not include likely future insurance premium increases in view of increased flooding and tsunami risks—against which coastal wetland and mangrove systems provide effective protection; neither do they include the need for India to import more fossil fuels for longer into the future if resource efficiency measures are not integrated into infrastructure development.

2. INTRODUCTION

When assessing whole-life costs as part of value for money for infrastructure programs and projects, an assessment of externalities—negative or positive—should normally be conducted before making a decision. For example, the undertaking of a procurement may have an impact on the supply side capacity of a particular part of the private sector. Similarly, there will be potential positive and negative environmental and social impacts to be assessed. This is especially important in the PPP process, where governments have an opportunity to use risk distribution as a tool to negotiate public goods such as environmental and social gains during the tendering and contracting process, and incorporate specific conditions into concession agreements. If these externalities are not considered early, there is a danger of authorities getting locked into long contracts with severe penalties and low opportunity for necessary amendments later.

The discussion here refers to accounting concepts similar to those described in the "Green National Accounts in India" framework document (National Statistical Organization [NSO], 2013) released by India's Prime Minister earlier in 2013. Commissioned by Minister Jairam Ramesh when he was in charge of the Ministry for Environment and Forests (MoEF), and developed by eminent international and national experts, this document provides an outline of what would ideally be needed for a comprehensive set of national accounts. The document's central conclusion is that the basis for economic evaluation should be a comprehensive notion of wealth, where "wealth" means the social value of an economy's stock of capital assets—comprising: i) **reproducible capital** such as roads, ports, buildings, machinery; ii) human capital i.e., population with health and education and skill levels; and iii) natural capital, ecosystems, land, sub-soil resources etc. The document provides a detailed discussion of techniques to assign social values to human and natural capital.

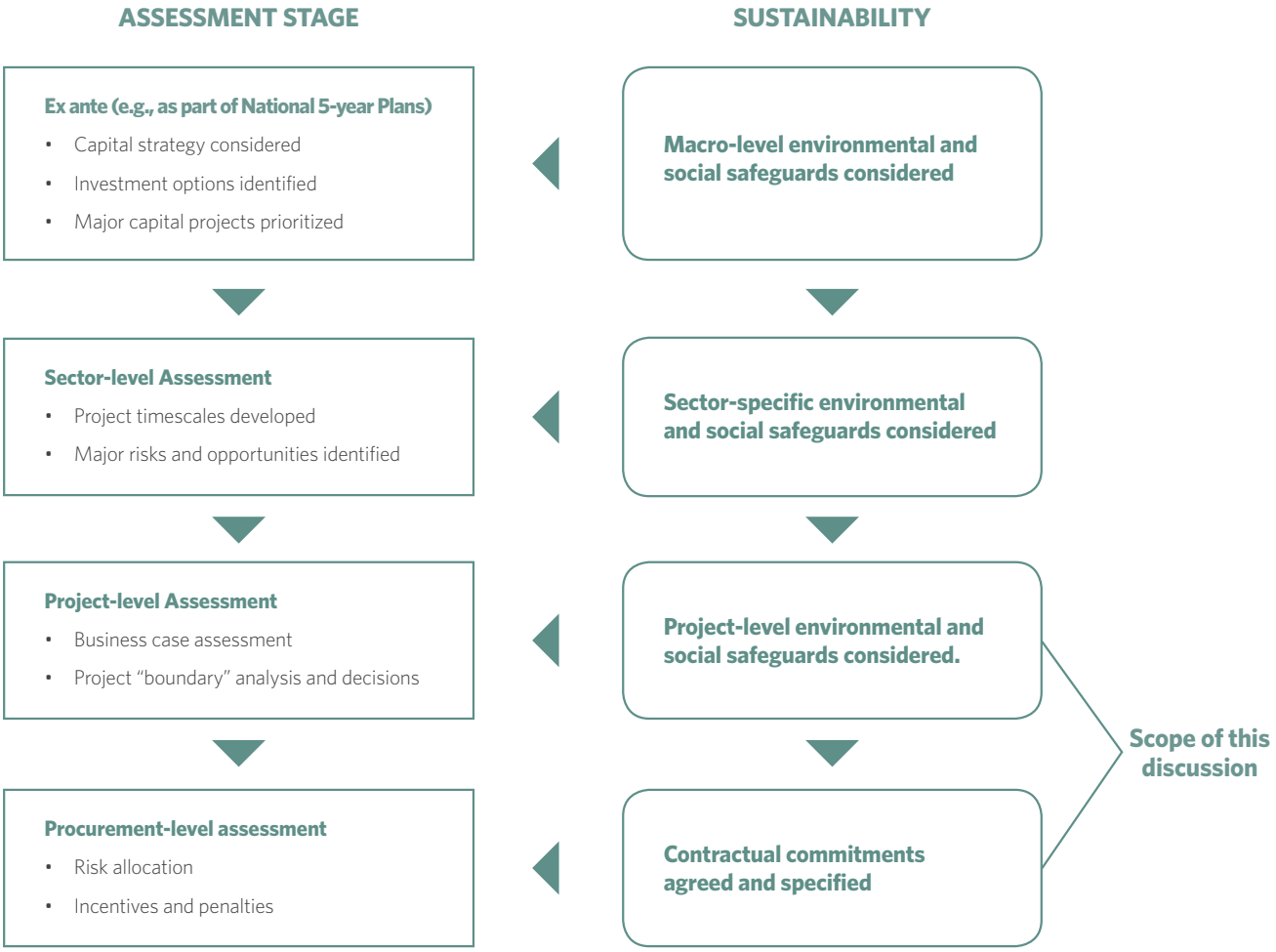
BOX 7. WHAT THE TWELFTH FIVE-YEAR PLAN SAYS ABOUT GREEN NATIONAL ACCOUNTS

"Part of the problem is that the conventional ways of measuring GDP in terms of production do not take account of environmental damage caused by production of certain goods which should properly be reflected as a subtraction from GDP. Only if GDP is adjusted in this way for environmental costs that growth of adjusted GDP can be called a measure of the increase in total production in the economy. Recognising this problem, the Planning Commission has commissioned an Expert Group under Professor Partha Dasgupta to prepare a template for estimating green national accounts which would measure national production while allowing for negative effects on national resources." (p. 10)

Using publicly available data on live PPP projects in India, this section provides illustrations of the scale of potential impacts to human and natural capital. Because the range of infrastructure provided through PPP is very large, it is not possible within this project to provide an overview of potential losses and gains for every sector. We therefore examine some issues related to land identification, allocation and protection that arise across sectors, as well as issues related to embodied energy in highway construction.

Level of Assessment Covered in This Discussion

Of course, the consideration of potential environmental and social outcomes begins at a very broad level, at the creation of industrial and infrastructure policy. For example, industrial policy will include strategic decision making related to requirements for coal-fuelled power plants vs. power production facilities using other renewable and non-renewable fuels; infrastructure policy will consider if investing in roads and highways is preferable to investing in rail and other public transport networks. There is no doubt that investing in roads and coal power plants locks in carbon emissions for the long term; on the other hand, it is widely recognized that the lack of power and transport infrastructure has held back economic development in India and many other developing countries. These debates are very substantial, and are not entered into here. The level of the assessments mentioned within this section is represented in the diagram below.



Source: Author diagram, based on HM Treasury, 2006.

3. LAND IDENTIFICATION, ALLOCATION AND PROTECTION

The previous section of this report described the processes applicable in terms of land acquisition, and highlighted that early action can be instrumental for governments in reducing acquisition risks. Early investigation and action are also essential at the land-identification stage, well before acquisition or allocation is considered. This is because there are normally significant social, economic as well as environmental concerns related to most land assets; if these are not well considered right at the beginning, there is a danger of losses from all these perspectives.

For example, coal-fired thermal power plants in India are often developed on coastal areas where there is proximity to ports receiving imported coal and where the operations can benefit from the use of sea water for cooling. Coastal areas are often host to sensitive ecosystems such as wetlands and mangroves, which provide a variety of ecosystem services—upon which a large number of people typically depend for their livelihoods. Indeed, along with river valleys, coastal plains with abundant wetlands have been the focus of human civilization for over 6,000 years (Ramsar, n.d.).

Globally, wetland ecosystems provide us with services worth trillions of U.S. dollars every year, thus making a vital contribution to human health and well-being. The ecosystem services—the benefits people obtain from ecosystems—provided by wetlands include:

- Flood control
- Groundwater replenishment
- Shoreline stabilization & storm protection
- Sediment & nutrient retention and export
- Water purification
- Reservoirs of biodiversity
- Wetland products
- Cultural values
- Recreation & tourism
- Climate change mitigation and adaptation

With the global population set to increase to nine billion by 2050, increasing the pressure on water resources and the threats posed by climate change, the need to protect these benefits has never been greater or more urgent. There is in fact a need to go further than protection, towards enhancement and maximization of these benefits. Enhancements can be made as part of infrastructure development.

Recognizing the need for protection, a coastal regulation zone has been set aside in India, typically covering 500 metres inland from highest tide lines and where industrial development is not permitted without special conditions.

Valuations of ecosystem services in general, including wetland system services, necessarily vary widely depending upon many variables, including scope, method and geography. Ramachandra Alananda, Rani and Khan (2011) report that, based on a study of 17 ecosystem services in 16 biomes, coastal wetland systems have an average annual economic value of US$14,785. Ramsar references a study which finds that the loss of one hectare of coastal wetland in the United States resulted in the loss of ecosystem services worth US$33,000 per year, on average. The value of individual wetlands can be even higher—an earlier study (referred to in Ramachandra et al., 2011) reported the value of relatively pristine wetland in Bengaluru (Karnataka state, India) as INR 3,808,775/ha/year, which, at a currency exchange rate of INR 60 =US$1.00, would translate to approximately US$63,500/ha/year.

Potential Wetland Ecosystem Losses at Sompeta

In 2008, Nagarjuna Construction Company (NCC Limited) applied for environmental clearance for a 2640 MW coal-fired thermal power plant project over 2,424 acres in Sompeta Mandal, Srikakulum District in the state of Andhra Pradesh. Proposed debt providers included PFC, State Bank of India and the ICICI Bank (Projects Today, 2010); minority equity partners included PE firm Blackstone and investor Rakesh Jhunjhunwala (Sukumar, 2011).

In 2009, clearance was provided for an adjusted area of 1,890 acres and for a first phase of 1,320 MW. The company, through its subsidiary NCC Power Projects, had acquired 972 acres allotted by the Andhra Pradesh government : a further 573 acres were bought from private owners (Udgirkar, 2010).

Sompeta, locally known as "Beela," provides a habitat for 491 plant species and 121 bird species, some of them migratory. It is home to 74 per cent of the plants and 52 of the birds found in the whole of Srikakulam district. Many bird species seen here fall under the IUCN "Red List."

The project was opposed by locals and NGOs on the grounds that it would significantly disturb the livelihoods of thousands of farmers and fishers in two towns and over 30 villages, while destroying an area of significant ecological value. The main issue under consideration was found to be the classification of 756.69 acres of land allocated by the government; this land was largely classified by the EIA as wasteland, whereas locals claimed it was actually ecological productive wetland, linked to other wetlands which in turn join the sea. Concerns related to: loss of agriculture, livestock, fishing and natural-produce based livelihoods; loss of

natural capital such as medicinal plants; loss of very valuable fauna; low possibility of local employment at power plant other than on a menial basis; and significant local air and water pollution.

The concessionaire disputed the classification of land as wetland and offered the following compensation for 168 fishing families who held fishing leases: an area of 4.6 acres for the relocation of their homes and INR 50,000 (under US$1,000) each for the reconstruction of their homes. The concessionaire also provided assurances around jetty design, cooling water discharge and use of pollutant control measures.

In response to local concerns, a local government minister requested a further MoEF site inspection. News reports suggest that the project developer NCC started to conduct some site work a few days in advance of the site inspection, which led to protests by villagers and scuffles which resulted in the tragic deaths of three people.

The MoEF expert site inspection a couple of days after this incident found that the land under dispute was indeed "typical wetland of great ecological significance." In May 2012, the National Green Tribunal (NGT) cancelled the environmental clearances, and it appears that the project will be moved to another, more suitable location.

Using the hypothesis that the Sompeta wetlands would be valued at the global average of US$14,785/ha/year for wetland systems, the annual value of the ecological system services provided by the 757 acres (306 hectares) of land allocated by the state government to the TPP project would be **US$4.5 million per year**. This is an illustration of the potential value of services provided by the land to the local and global population. As this value was not identified at the beginning of the process, losses have occurred to all parties involved.

4. IMPACTS OF HEAVY INDUSTRIALIZATION AT MUNDRA

The coastal Mundra region in Kutch district, Gujarat, hosts two of India's largest thermal power plants (TPPs). One of these is the "ultra-mega" TPP by Coastal Gujarat Power Ltd (CGPL), a member of one of India's largest industrial groups, Tata. The project includes five units of 800 MW each, with a total capacity of 4,000 MW. The project's financiers include the International Finance Corporation (IFC) and the Asian Development Bank (ADB).

The second is by the Adani Group, which has three initiatives in the Mundra coastal area of Kutch district in Gujarat: A special economic zone (SEZ), the Mundra Port and a proposed coal-based TPP. These activities are located in a contiguous region and as such, environmental and social impacts are inter-related and often cumulative. Approvals have been sought and granted in different phases for the different activities.

The Adani project received coastal regulation zone clearance from MoEF in May 2008 for a proposed 2 x 330 MW component of the planned 4,620 MW thermal power plant, one of the largest power plants in the world. The clearance was provided on the condition that no damage whatsoever would result to mangroves and other parts of the sensitive coastal ecosystem. If any damage to mangroves was anticipated/envisaged as a result of project activities, the clearance would stand cancelled and fresh approval would be needed. Further, the approval stated that all issues raised in public hearings would need to be addressed and reports submitted periodically. Various conditions were also imposed related to drainage, disposal of effluents, protection of water channels and ensuring no displacement of people or fishing activity.

In 2011, a public-interest litigation was filed by a local farming association, alleging that environmental clearances had been violated. MoEF set up an expert committee to look into the matter, and this committee's report was submitted in April 2013. In its report (MoEF, 2013), the Committee was clear that there had been significant changes in the landscape of the Adani Port and SEZ area, including changes in the creeks—which are crucial to ensure the health of the mangroves and water system of this marine outfall area. The committee noted that some creeks were showing signs of damage caused by soil deposits blocking access of seawater into the area. Over time and without adequate mitigation efforts, this would block the creek and lead to the eventual death of mangroves, depending on intertidal water action.

The Committee also identified the following main issues:

- There had been an attempt to bypass statutory procedures by using different agencies, at centre and state, for obtaining clearances.
- The public hearing procedure has been bypassed on one pretext or another.
- An airstrip has been constructed without the appropriate environmental clearances.
- Grazing land has been encroached upon.
- Non-compliance with EIA has been in the critical areas of:
    - Blocking of creeks, and actual and potential destruction of mangroves
    - Waste material utilization and disposal—10 per cent of fly ash is unaccounted for.
    - Groundwater protection—intake and outfall channels and the reservoir are unlined and unprotected to guard against groundwater pollution
    - Non-compliance with monitoring and reporting conditions

The committee made the following recommendations:

- An environmental restoration fund should be created, for at least 1 per cent of project cost.
- Part of the environmental clearance should be cancelled so that mangroves can be restored.
- Several measures need implementing for protection of creek systems and mangroves.
- Public monitoring system needs to be put in place for fly ash disposal and transportation.
- Revised fly ash utilization plan is required.
- Tsunami and earthquake impact assessment to be conducted (Kutch has a history of earthquakes and in 2001 was the centre of one of the most severe earthquakes in India's history).
- Several groundwater protection and monitoring measures are required.
- Grazing lands need to be voluntarily returned.
- A specific plan is required for fishers including access and livelihood analysis; an exclusive fishing harbor should be built.

There are also recommendations on the reform of relevant regulations, project clearance conditions and post-clearance monitoring.

An independent report (*Report of the Independent Fact-Finding Team*, 2012) into the Tata project described very similar concerns and described the cumulative dangers of siting both projects so close to each other.

Not all aspects of non-compliance or remedial actions can be measured or valued as part of this study. However, mangrove destruction can be taken as one example.

The consequences of mangrove destruction and valuations of mangroves are detailed in Gilman Ellison, Duke and Field (2007) and Ramsar Secretariat (2001), who have in turn referred to a wide variety of scientific papers for data. According to these studies, mangroves perform valued regional and site-specific functions. Reduced mangrove area and health increases the threat to human safety and shoreline development from coastal hazards such as erosion, flooding, storm waves and surges, and tsunamis, as recently observed following the 2004 Indian Ocean tsunami. Mangrove loss will also reduce coastal water quality, reduce biodiversity, eliminate fish and crustacean nursery habitat, adversely affect adjacent coastal habitats, and eliminate a non-replaceable source of essential and numerous products and services for some human communities. Mangrove destruction can also release large quantities of stored carbon and exacerbate global warming and other climate change trends.

The annual economic values of mangroves globally, estimated by the cost of the products and services they provide, has been estimated to be **US$200,000 to US$900,000 per hectare**. In Malaysia, for example, the value of mangroves just for storm protection and flood control has been estimated at US$300,000 per kilometre of coastline, based on the cost of replacing the mangroves with rock walls.

Mangroves can also be provided with an economic value based on the cost to replace the products and services that they provide, or the cost to restore or enhance mangroves that have been eliminated or degraded. The range of reported costs for mangrove restoration is from US$225 to US$216,000 per hectare, not including the cost of the land. In Thailand, restoring mangroves has cost US$946 per hectare, while the cost for protecting existing mangroves was found to be only US$189 per hectare. Accurate predictions of changes to coastal ecosystem area and health, including in response to projected relative sea-level rise and other climate change outcomes, enable site planning with sufficient lead time to minimize and offset anticipated losses.

According to Hirway & Goswami (2006), the value of mangrove areas in Gujarat was INR 2247 *crore* per year (2003 prices). This implies a value of approximately INR 0.49 *crore* (~US$83,000) per year per hectare in 2013 prices. Managed properly, the study estimates that value could rise at the rate of 10 per cent per year. Gujarat has experienced a drastic decline in the area under mangroves during the past 50 years. Only 911 square kilometres (91,100 hectares) of mangroves remained in the state in 2001, approximately 80 per cent of which was located in Kutch District. The imperative to maintain these areas is therefore very high.

The Report of the Independent Fact-Finding Team (2012) found detailed information relating to the impacts on fishing in the region of the two projects. Approximate figures gathered showed that until 2004–2005, 12 boats in the area used to catch INR 25–27 lakhs worth of fish each year. In the year 2010, 16 boats were used here, netting only INR 21 lakhs of fish for the year, and in 2011, 21 boats were used here, but the catch was worth only about INR 90,000. Not counting inflation, this represents **a decline of more than 80 per cent in the value of fishing stocks in less than 10 years.**

FIGURE 16 FISHING ACTIVITY NEAR INLET CHANNELS WITH TATA TPP ON THE LEFT AND ADANI TPP ON THE RIGHT, BOTH PROJECTS ONLY PARTIALLY COMPLETE.

Source: Report of the Independent Fact-Finding Team, 2012.

For the Tata TPP project, the international financial institutions (IFC and ADB) backing the project require environmental health safety and social (EHSS) compliance audits on a quarterly and annual basis. These reports (SENES, 2012–2013) state that there have been very significant delays in planning for and implementing the "Local Hiring and Procurement Policy" for the project. In fact, no policy had been created even after three of the five 800 MW units had been commissioned, despite the fact that the policy was surely intended to apply during all phases of the project, including the planning, construction and operation phases. One of the latest reports, written just before commissioning of the 2nd and 3rd units, describes how even basic elements of the policy had not yet been considered (SENES, 2012-13):

> "As mentioned in the earlier reports the entitlement matrix needs to be prepared for employment of PAPs. For the preparation of the entitlement matrix the following [still need] to be decided:
>
> a. Policy for employment under rehabilitation for affected/land sellers families should be clarified and
> b. Definitions for key concepts such as 'Family', 'separate family' (adult married sons, unmarried daughters—age to be defined, handicapped/disable family member, deserted, abandoned and divorced women), 'PAP', category of land loser/seller, eligibility for employment, etc. should be formulated.
> c. Concerns related to priority, alternatives in case the affected family or person as not ordinarily residing in the village, death of nominee, absence of legal heirs for affected families need to be worked out in principle and practice."

It is clear from the above that local employment had not been given due consideration at the stages of constructing and operationalizing the plant.

The Twelfth Five-Year Plan targets the creation of 88,000 MW of new power generation capacity, or approximately 10 times the combined capacity of these two gigantic power plants in Mundra. We have discussed here a small part of the potential and real environmental and social impacts of these projects; great care will need to be taken to ensure that such negative impacts do not occur with the additional projects that come in line in the next few years.

Ecological Losses From Road Construction

- Road construction leads to significant ecological issues; Seiler (2001) provides details of the five major categories of primary ecological effects:
- Habitat loss: Construction of roads always implies a net loss of wildlife habitat. The physical encroachment on the land gives rise to disturbance and barrier effects that contribute to habitat fragmentation.
- Disturbance: Roads, railroads and traffic disturb and pollute the physical, chemical and biological environment and consequently alter habitat suitability for many plant and animal species for a much wider zone than the width of the road itself.
- Corridor: Road verges and roadsides can, however, provide refuges, new habitats or serve as movement corridors for wildlife.
- Mortality: Traffic causes the death of many animals that utilize verge habitats or try to cross the road or railroad. Traffic mortality has been growing constantly over the years, but is considered a severe threat only for a few species. Collisions between vehicles and wildlife are also an important traffic safety issue.
- Barrier: For most non-flying terrestrial animals, infrastructure implies movement barriers that restrict the animals' range, make habitats inaccessible and can finally lead to an isolation of populations. The barrier effect is the most prominent factor in the overall fragmentation caused by infrastructure.

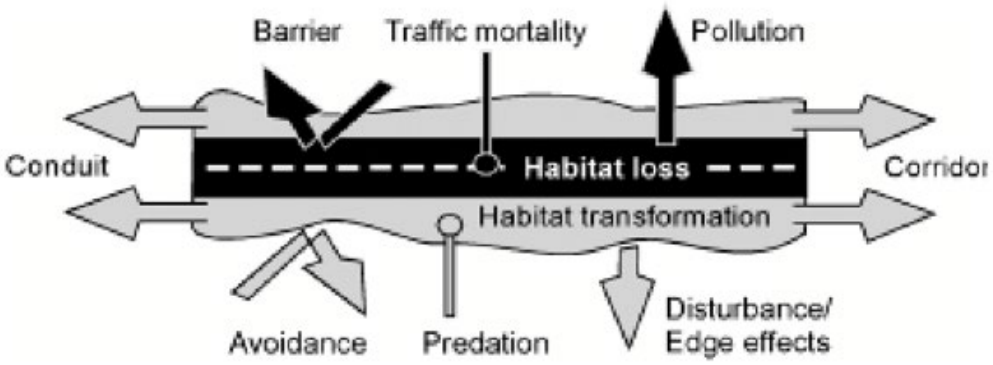


FIGURE 17 ILLUSTRATION OF ECOLOGICAL EFFECTS OF ROAD CONSTRUCTION

Source: Seiler, 2001.

Land-related issues can become a significant consideration even for road-widening projects. The Kishangarh-Udaipur-Ahmedabad (K-U-A) Highway 555-kilometre six-laning project with estimated cost of INR 5,387.30 *crore* (~ US$880 million)was awarded to GMR Group in 2011 using the DBFOT (toll) model, awarded for 26 years. GMR was the highest bidder, offering INR 6.3 billion (~ US$100 million) per annum premium (negative grant). The project faced significant delays in receiving environmental clearances and in land acquisition. Citing these issues, GMR dropped out in December 2012, but in April 2013 offered to return if NHAI agreed to a restructuring of the annual premiums as follows: 75 per cent reduction of premium for first 10 years (debt repayment period) followed by 300 per cent per annum of original annual premium for the remainder of the project, ostensibly resulting in the same amount overall to the NHAI. NHAI and MoEF blame each other for the delays with MoEF claiming that the application was incomplete.

A part of the EIA for this project was available on the web. The most significant environmental and social issues and remedies identified in the EIA were:

- 60 hectares of forest diversion was to be offset by compensatory afforestation in other specified areas.
- 18,830 trees will be felled and will need replacing.
- Approximately 467 residential, 1,373 commercial and 176 residential-cum-commercial structures were due to be affected.
- Underpasses need to be created for safe crossing of wildlife at regular intervals (to counter the barrier effect referred to above).
- Noise and air pollution would need to be minimized during construction using several measures identified in the EIA.
- Some loss of productive soil will occur due to use of agricultural land, and there was significant potential for soil erosion.

Again it is not possible within the scope of this discussion to assess all the potential impacts referred to above. However a closer look can be taken at the value of forests.

Various studies, referred to in Kumar et al (2012), have valued India's forests at between 1.1 per cent and 2.2 per cent of GDP. In 1999, the MoEF (referred to in Verma & Kumar, 2006) estimated that forests contribute 1.7 per cent to India's GDP.[9] If this is still true, then based on 2012 GDP of US$ 1.842 trillion, the contribution of forests to India's economy was approximately US$31 billion that year (World Bank, 2013a). India's forests cover approximately 68 million hectares and therefore the economic contribution of one hectare of forest would be approximately US$460 per year.

Verma & Kumar (2006) estimated the non-timber value of forest cover in Himachal Pradesh to be approximately INR 5,283 *crore* in 2001–2002 (approximately US$1.9 billion) (Verma & Kumar, 2008). As Himachal Pradesh's forest cover in 2001–2002 was estimated as 1.4 million hectares, this would mean an average value per hectare of approximately US$1,357. Adding the value of timber to this would take the total value of one hectare of forest to approximately US$8,500. From the figures above it is clear that

[9] Moreover, non-timber forest products provide about 40 per cent of total official forest revenues and 55 per cent of forest-based employment. Nearly 55 million people living in and around forests in India depend upon non-timber forest products as a critical component for their sustenance.

the value of services provided by 60 hectares of forest cover in the K-U-A highway project is **tens if not hundreds of thousands of dollars per year**. Indeed if the value is in the same range as forests in Himachal Pradesh, the value would be **approximately US$0.5 million**.

As mentioned in Section 3 of this report, compensatory afforestation schemes in India have shown significant weaknesses in implementation. According to a press report in 2008, an audit by the Comptroller and Auditor General (CAG) on diversion of forestland for non-forest purposes in Madhya Pradesh found significant cases of violations in such measures (India Together, 2013). In fact, the report found "virtual non-execution of compensatory afforestation measures."

Another CAG report, this time focused on Andhra Pradesh, found that

> "Non-forest land handed over for compensatory afforestation in lieu of diversion of forest land was already afforested, violating the spirit of the Forest Conservation Act, 1980. In another case, compensatory afforestation could not take place due to non-availability of identified non-forest land, which was caused by improper identification of non-forest land in a faraway Division" (Supreme Audit Institution of India, 2013, p. vii).

Even when compensatory afforestation is carried out as per the commitment, it will take years for a new forest to provide the same value of ecosystem services as that provided by mature forests. Hence there may be a case for compensatory afforestation to actually ensure more afforestation than a simple 1:1 replacement for mature forests being felled.

Compensatory afforestation is an offsetting mechanism where damage to forest ecosystems in one place is compensated for through development of a similar ecosystem elsewhere. There are other systems used internationally to conserve and enhance natural stocks and the products and services they provide:

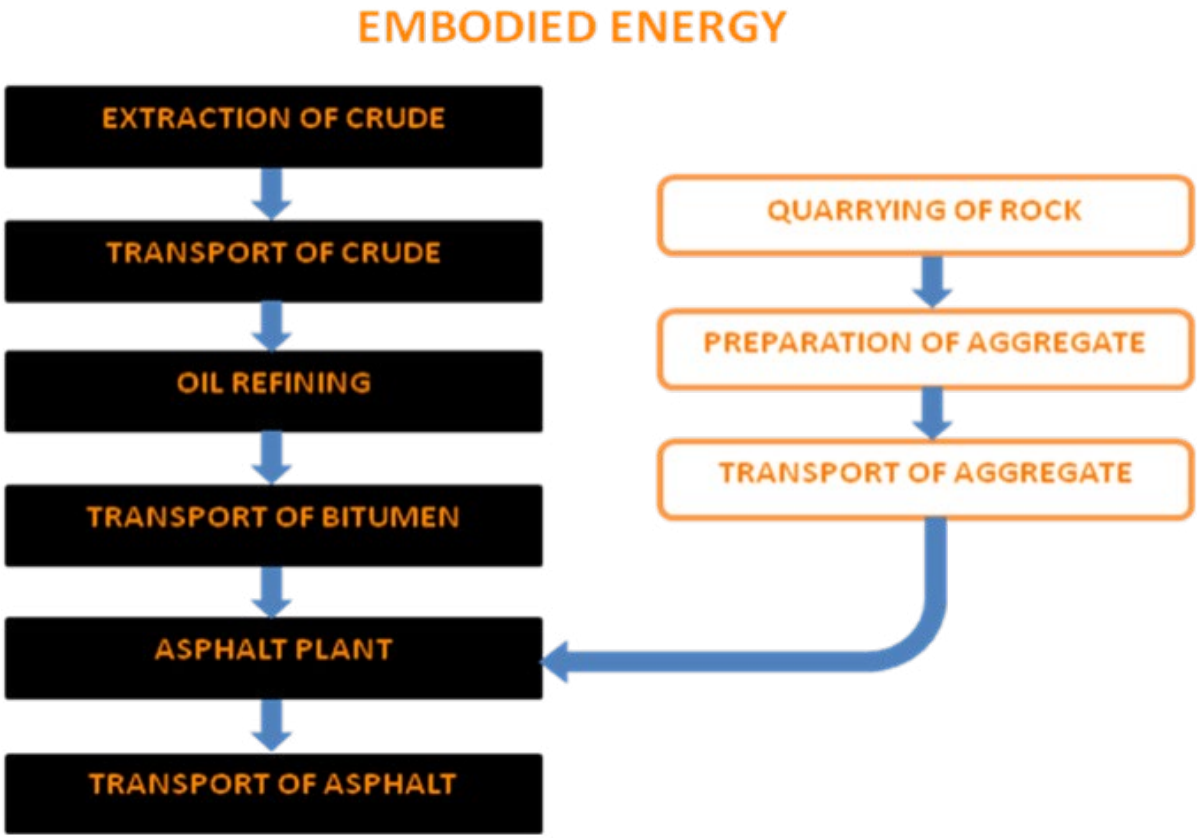
Biodiversity Offsets are used in the United Kingdom, where offsets are "conservation activities that are designed to give biodiversity benefits to compensate for losses – ensuring that when a development damages nature (and this damage cannot be avoided) new, bigger or better nature sites will be created. [They] need to show measurable outcomes that are sustained over time" (Department of Environment, Food and Rural Affairs, 2013).

The **Clean Development Mechanism (CDM)** has been successful in generating carbon credits in developing countries in past decade. The credits can be sold internationally to help developed countries meet their carbon targets. For example, one 4,003-hectare reforestation project in Himachal Pradesh was expected to yield 828,016 carbon credits valued at US$5 each, or total project revenues of approximately US$4 million (US$1,000 per hectare) (Mid Himalayan Watershed Development Project, n.d.).

Payments for Ecosystem Services (PES) is a mechanism gaining popularity internationally. The term PES is used to describe schemes where the beneficiaries, or users, of ecosystem services provide payment to the stewards, or providers, of ecosystem services. PES involves a series of payments to land or other natural resource managers, in return for a guaranteed flow of ecosystem services over and above what would be provided without such payments. One of the largest examples of this is the United Nation's REDD+ programme, which assigns a financial value to the carbon stored in forests and offers incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths towards development. Using REDD+ for example, in September 2013 the World Bank and the Government of Costa Rica agreed a deal worth up to USD 63 million for forest conservation, land restoration and agro-forestry with the objective of reducing greenhouse gas emissions and increasing carbon sequestration (IISD, n.d.).

5. EMBODIED CARBON DIOXIDE IN ROAD CONSTRUCTION

The concept of embodied energy in construction refers to the energy used through the lifecycle of the construction materials and process. There are many processes that contribute to the embodied energy of the many materials involved in road construction. The diagram below shows some of the processes that create embodied energy in asphalt roads. Similar diagrams can be made for the other materials used in roads such as concrete, steel and sub-base materials.



Source: Adapted by Author from Lambert, 2010.

In 2010, the Asian Development Bank published a report (ADB, 2010) describing the embodied carbon emissions of some of its road projects in India. The carbon emissions from the construction phase ranged from around 60 tonnes CO_2e per kilometre for a rural one-lane project, to a very significant 2,115 tonnes CO_2e per kilometre for the 123-kilometre long EW-II national highway project in Madhya Pradesh and Uttar Pradesh, which converted a two-lane highway to four lanes.

According to Greenroads (2011), the construction process for one lane of road, one mile long in the United States consumes the same amount of energy used in one year by 50 average American households, or (conservatively) approximately 550 MWh (U.S. Energy Information Administration, 2013). The most efficient coal plants currently in operation emit at a rate of at least 0.8 tonnes of CO_2 per MWh and thus every mile of every lane constructed using energy from coal would be responsible for approximately 440 tonnes of CO_2 emissions.[10]

The carbon footprint of construction was also calculated for a pilot road project in Australia by identifying the greenhouse gas emissions generated by on-site electricity, fuel used by construction plant on-site, transport of materials to site and the embodied carbon of materials used, such as asphalt, concrete, steel etc. (Institute of Public Works Engineering Australia, n.d.). The carbon footprint associated with the construction of the road was 730 tonnes CO_2e per km of road built. Ninety seven per cent of

[10] Of course, energy used to construct roads will come from a variety of sources, including burning oil in generator sets on site—which would be even more polluting. All figures used here are illustrative.

this came from the embodied carbon of materials (73 per cent) and on-site transport (24 per cent). The remainder came from transport of materials to site (2 per cent) and on-site electricity (1 per cent).

What is clear from the studies above is that carbon emissions of road construction are on the order of hundreds or thousands of tonnes of CO_2e emissions per kilometre. If the 555-kilometre K-U-A six-laning project has levels of embodied carbon in construction similar to the ADB project mentioned above, the embodied carbon there would nearly **1.2 million tonnes of CO_2e**. This would be equal to the average annual emissions of approximately 700,000 Indians (World Bank, 2013b).

According to the Twelfth Five-Year Plan (the Plan), more than 60 per cent of investment requirement for India's arterial road network development is expected to be financed through PPPs. With at least 45,000 kilometres of projects in the works, the potential impacts are enormous. If the embodied energy in construction for all these projects is the same as that the of the ADB project mentioned previously, the impact will be **close to 100 million tonnes of CO_2e**.

Significant energy and carbon savings can be made, however. A highways project in England used recycled materials to achieve 3.5% CO_2 savings as compared to a base case where only primary materials would be used (WRAP, n.d.a). The requirement for imported primary aggregates was reduced by over 50,000 tonnes by use of in situ stabilization of soils, use of locally sourced recycled aggregate from demolition rubble and reuse of recycled asphalt from the redundant carriageway. The recycled asphalt was used as capping, unbound sub-base and in new asphalt for the base and binder courses of the new carriageway. If the maximum allowable recycled materials had been used, the project could have achieved 8.1 per cent savings compared with the base case.

A separate highway reconstruction project in England (WRAP, n.d.b) was able to save 55 per cent of CO_2 emissions by replacing the traditional hot-mix bituminous asphalting process with a new cold-mix (foam) process which facilitates effective bituminous coating of recycled (and non-recycled) aggregates even at cold temperatures.

Cold-mixing, using different specifications, has been used in Assam in India: Das (2013) reports that 1,400 kilometres of roads have been laid using this technology, with CO_2 savings of over 8,000 tonnes. This measure, combined with other green measures used on these roads (such as the replacement of stone and concrete with planting in road verges and slope protection) has reportedly resulted in the creation of approximately 580 average person-years of employment.

The use of recycled materials in place of virgin materials is a significant opportunity to improve the carbon footprint of road construction. The breakdown below shows the composition of the embodied energy of materials from the Australian project mentioned above. There is great potential to use recycled materials to replace most of these materials in significant quantities.

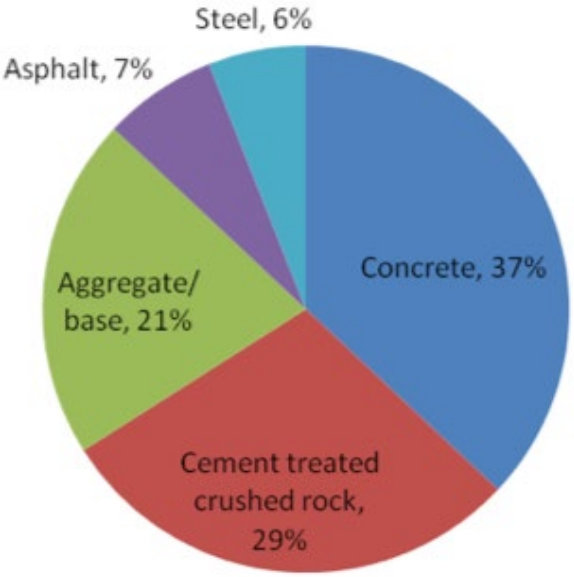


FIGURE 18 BREAKDOWN OF EMBODIED CARBON IN MATERIALS, IN AUSTRALIAN PILOT PROJECT

Source: Adapted from Lambert, 2010.

In most cases, the use of recycled materials results in construction cost savings. For instance the use of recycled materials for cement clinker has been specifically identified by McKinsey & Co. (2009) as one of the few major cost-negative opportunities for India to reduce emissions. If these opportunities are not taken, emissions reductions in future may have to be made through measures where marginal abatement costs are significantly higher.

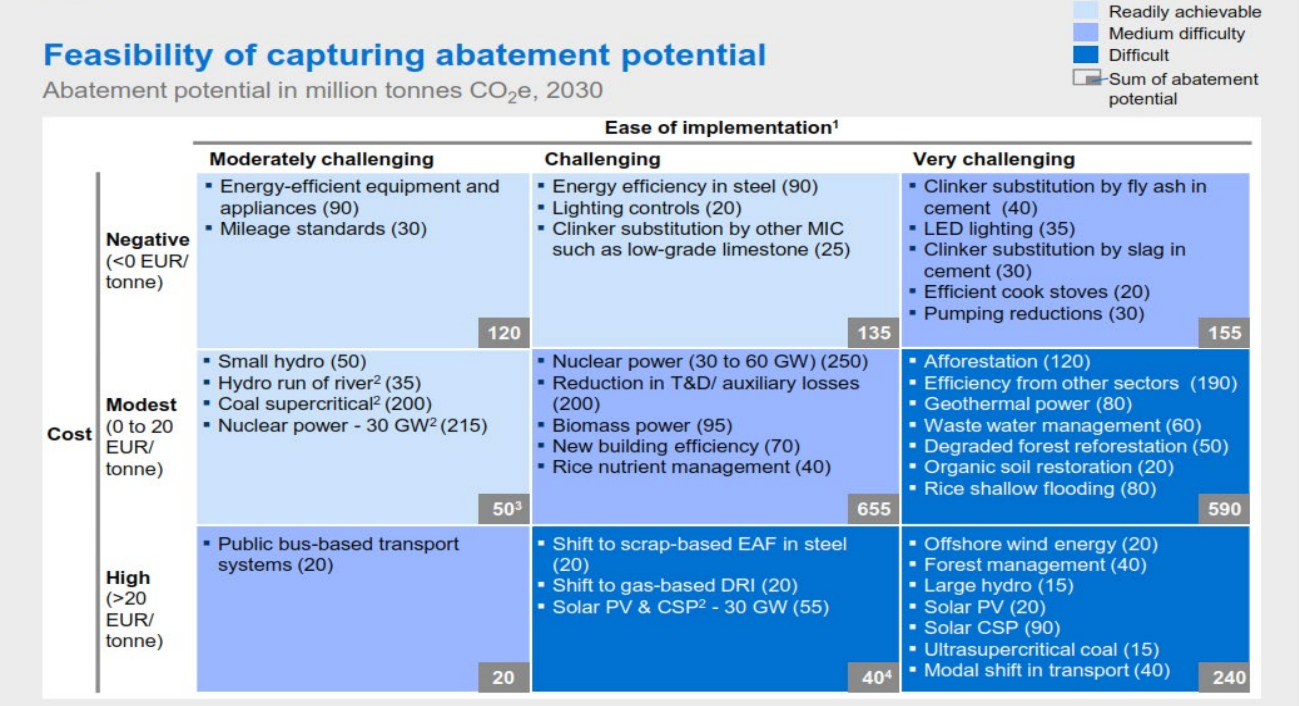


FIGURE 19 ABATEMENT COSTS AND EASE OF IMPLEMENTATION OF DIFFERENT MEASURES IN INDIA

Source: McKinsey and Company, 2009.

Losses Due to Delays and Cancellations

There are a number of PPP projects in India where environmental and social concerns have been blamed for project delays and cancellations. The 19-kilometre Chennai Port–Maduravoyal Expressway project was to provide high-speed connectivity to state and national highways from the port. The project entailed the relocation of thousands of families; and also construction near sensitive river bed areas. The road was to open in September 2013. However, very little work had progressed by August 2013 and news reports suggest that NHAI was under pressure to provide the contractor with hundreds of *crores* of rupees in compensation as "idling charges" (charges for equipment and labour remaining idle) as a consequence of delays in land acquisition (Mariappan, 2013). In fact the reports suggest that NHAI now preferred to call off the project. With some construction already complete, it is clear that such delays and cancellations can cause significant losses to all parties concerned.

It appears that there had not been enough consideration and preparation for land acquisition prior to the NHAI accepting the risk liability for this component of the project. Similarly, the Sompeta project case appears to show that more preparation could have helped the government understand the nature of the allocated project site, which may have avoided the cancellation of this project along with the significant associated losses.

According to FICCI and Ernst & Young (2012, p. 12), "most infrastructure projects commissioned during the last two Plan periods witnessed time and cost overruns: around 42% of the total number of 564 infrastructure projects in India, costing more than INR 1.5 billion, are delayed . . . This has resulted in an average escalation of 16.9%, amounting to an incremental cost of INR 1,207 billion" (~ US$ 200 million).

TABLE 3 PROJECT DELAYS AND OVERRUNS

SECTOR	NUMBER OF PROJECTS DELAYED	DELAY PERIOD (IN MONTHS)	COST OVERRUN/PERCENTAGE ESCALATION (INR BILLION)
Road	78	2-101	22 (8%)
Power	47	1-83	146 (12%)
Oil & Gas	31	4-120	83 (10%)
Railways	27	2-204	302 (137%)
Urban	1	24	52 (82%)
Coal	17	9-48	31 (27%)
Shipping and ports	10	2-93	8 (10%)

Source: FICCI and Ernst & Young, 2012, quoting figures from Ministry of Statistics and Programme Implementation.

This raises the question of whether government agencies should accept the liabilities associated with environmental and social clearances and land acquisitions without undertaking much more in-depth analysis, preparation and possibly even implementation of the required mitigation actions. For example, land acquisition and proper resettlement do not need to wait until after contracts are signed; these activities can perhaps be undertaken beforehand. FICCI and Ernst & Young recommend that the government should require sponsoring agencies to acquire 90 per cent of the total land or 70 per cent of the contiguous land before offering a project for bidding.

At the moment, some risks (such as those to people's livelihoods, of delays in resettlements, and of damage to the local microclimate from loss of local wetlands) result in contingent liabilities during the term of the project; while any damages accruing at the end of the project may be reflected in a lower asset value at the point of transfer back to the authority. It would be prudent to mitigate these risks and liabilities as much as possible in advance.

A **contingent liability** is a potential obligation that may arise depending on the outcome of a future event. Here, the outcome of an existing situation is uncertain, and this uncertainty will be resolved by a future event. A contingent liability is recorded in the books of accounts only if the contingency is probable and the amount of the liability can be estimated.

For example, where a company is facing a lawsuit from a rival firm for patent infringement: if the company's legal advisors' opinion is that the rival firm has a strong case, an amount commensurate with the risk is booked on the company's balance sheet; if they deem the lawsuit frivolous, no contingent liability is necessary.

In the context of this discussion, the lack of adequate project preparation results in contingent liabilities relating to costs of delays and cancellations such as: responding to public interest litigations; potential contractor "idling" damages as seen in the Chennai Port project; restoring damaged ecosystems; compensating people for loss of livelihoods; etc.

A Note on Seizing Benefits

As seen in the discussion above, from an environmental and social perspective the current debate is mainly restricted to the mitigation of negative impacts. However, it must be noted that significant gains are also possible. For example, mangrove protection efforts can be turned into mangrove restoration efforts in surrounding areas. Resettlement options should result in better settlement conditions.

Where there are potential benefits that can be gained as part of (or in parallel with) project implementation, an analysis will need to be conducted to understand if this can be made part of the procurement or if this can be conducted by another party. For example, preservation of mangroves can perhaps be made the responsibility of parties independent of the PPP implementation process using a special fund set up as part of project financing.

6. NOTES ON UNCERTAINTIES IN ASSESSING AND QUANTIFYING LOSSES AND BENEFITS

Due to the lack of readily available and project-specific data, a wide range of proxies and assumptions have been used here in order to illustrate the scale of costs and benefits. The authors do not claim to have been able to provide accurate estimates or ranges when presenting numbers in this report, and the numbers are used only for illustration. The authors would recommend that better data should be generated and made publicly available so that infrastructure sector stakeholders in India can begin to more accurately estimate the public good impacts of their projects, even if this can never be an exact science.

The cost illustrations are likely underestimates, as it is impossible to consider all likely cost impacts. For example, the illustrations do not include likely future insurance premium rises in view of increased flooding and tsunami risks—against which coastal wetland and mangrove systems provide effective protection; neither do they include the need for India to import more fossil fuels for a longer period into the future if resource efficiency measures are not integrated into infrastructure development.

As noted in NSO (2013), there is a "dearth of good empirical work on shadow prices of natural capital as factors of production. The Report finds, for example, that there have been woefully few empirical estimates of the value of natural ecosystems in India" (p. 9). The report goes on to acknowledge that natural capital, and its value, is inherently site-specific; where "[A] village pond in West Bengal isn't the same as a seemingly identical pond in Kerala." For these reasons also there is significant uncertainty in the scale of figures presented in this section.

Further, it should be noted that some project details referred to are sourced from press reports. All references are marked here for clarity of sources; neither Thomson Reuters nor IISD takes any liability for the accuracy of this information.

Despite this uncertainty, it was felt important to use available data, proxies and assumptions to provide a sense of the scale of the losses and benefits possible from individual PPP projects.

SECTION V

How Environmental and Social Risks Affect Discount Rates and Risk Sharing

SECTION V – HOW ENVIRONMENTAL AND SOCIAL RISKS AFFECT DISCOUNT RATES AND RISK SHARING

1. SECTION SUMMARY

This section asks why the capital asset pricing model (CAPM) is not the most appropriate tool for demonstrating the long-term gains of green infrastructure projects. This affirmation is based on the following reasons:

- **Discount rates calculated with the CAPM for green projects fail to recognize environmental risks, and are consequently higher.** A higher discount rate favours projects with benefits that accrue early; lower discount rates encourage investors to adopt projects that offer returns at distant dates, like green projects. The mitigation of infrastructure projects' risks through appropriate environmental and social performance should be considered in the calculation of the discount rate.
- The particular high risks of green infrastructure make the CAPM unsuitable, as investors that cannot build fully diversified portfolios will **require compensation for unsystematic risks** (Oxera Consulting Ltd., 2011).
- The CAPM does not consider environmental risks in monetary terms and so it **misses the opportunity to incentivize PPP partners to mitigate environmental risks.**

The financial modelling of the PPP must use an accurate calculation of the discount rate for a proper project analysis. Environmental and social variables affect the profitability of the project and have a monetary impact across the lifecycle of the projects. This effect will make the PPP partners aware of their environmental exposure and, consequently, to realize the importance of mitigating those risks, by, for example, performing the activities necessary for obtaining environmental clearances.

The application of an alternative asset pricing model embedding environmental risks into the risk premium will then achieve a lower cost of capital. Therefore, **models including environmental risks will represent VfM for the Government of India and will enable it to make better procurement decisions.**

2. WHY ARE DISCOUNT RATES RELEVANT TO VFM CALCULATIONS?

PPP projects require a detailed planning and feasibility study. A financial analysis with due consideration of all costs and risks is undertaken to assess the commerciality of the project. On the financial modelling for the infrastructure project, a discount rate is used to convert projected cash flows into a present value to enable a comparison of competing options for which the cash flows reflect differences in both timing and amounts. The discount rate reflects the rate of return expected by an investor to compensate the investor for placing capital in a project.

The discounted cash flows methodology (DCF) follows a process whereby all future cash flows are projected over a given period and then adjusted to a common reference date using the discount rate. This discount rate reflects the time-value of money and the premium that is required by investors due to the systematic risks inherent to the project. Thus, the discounted cash flow methodology allows the measurement of the VfM and comparison across projects on a consistent basis taking into consideration the cost of capital for the project.

The PPP Discount Rate is the sum of the risk-free rate of the market and the project risk premium. Thus, the greater the risk of a project, the higher the risk premium charged by lender. Consequently, the financing cost of the project becomes higher.

Discount rate = risk free rate + risk premium

↳ 10-year Indian Treasury bond rate

The Discount Rate's Impact on Green Project Viability

The discount rate has an important effect on investment decisions. The choice of discount rate can make a huge difference to the valuation of government projects, especially when their costs and benefits occur over long periods. A typical infrastructure project involves upfront costs, with the benefits in the future. If so, the lower the discount rate, the more attractive is the project (the higher its net present value, NPV). **Lower discount rates encourage investors to adopt projects that offer returns at distant dates, like the case of green infrastructure.** Thus, the size of the discount rate makes a difference to the bankability of sustainable projects in which benefits occur in the distant future (Harberger, 1992).

For example, the NPV of any infrastructure project critically depends on the discount rate. **When the discount rate is higher, future costs and benefits become less important. A high discount rate favours projects with benefits that accrue early** (Harrison, 2010).

TABLE 4 HOW HIGH DISCOUNT RATES FAVOUR PROJECTS WITH BENEFITS THAT ACCRUE EARLY AND HOW LOW DISCOUNT RATES ENCOURAGE INVESTORS TO ADOPT PROJECTS THAT OFFER RETURNS AT DISTANT DATES

INFRASTRUCTURE	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Cash flow	900	100	100	100	100	200	1500
NPC using DR 15%	900	87	76	66	57	99	1285
NPC using DR 15%	900	86	98	97	96	190	1468

GREEN INFRASTRUCTURE	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Cash flow	0	100	200	300	400	500	1500
NPC using DR 15%	0	87	151	197	229	249	913
NPC using DR 15%	0	99	196	291	384	476	1446

Source: Highton, 2012.
Author's Calculation. Using the time value for money formula 1000/ (1+r) ^n

As observed on the table, green infrastructure projects imply higher initial costs which are compensated with lower maintenance cost during its life cycle (Highton, 2012). These costs are reflected in the cash flows of the project. The initial costs make the cash flows of the initial years of the project very low but they are compensated in later years with increasing cash flows due to lower maintenance cost. The "Council House 2" in Melbourne and "The Solaire" in New York, are two green building projects that offer examples in which initial capital costs (CAPEX) were proportionately higher and were then compensated with lower operation expenditure incurring high Capex of US$11.3 million and US$17.25 million respectively only in sustainability features which represent significant operations savings in upcoming years (Highton, 2012).

Following the table above, we can do the financial feasibility analysis of two infrastructure projects, one traditional and the other with green components, with exactly the same value of accumulated cash flows over five years, but with these cash flows being accrued at different moments in time. This will reflect that **the discount rate plays a decisive role in determining the financial feasibility of the green project**. The higher the discount rate, the more attractive the traditional infrastructure will be for the investor. When we discount the cash flows of both projects using a discount rate of 15 per cent of the net present value of traditional infrastructure projects is US$1285, making that option more financially attractive compared to the US$913 net present value of the green infrastructure, as seen in Table 3.

Nevertheless the lower the discount rates, the more attractive the cash flows become in the long term. When we use a discount rate of 1 per cent, the level of financial feasibility levels up for the projects, comparing a net present value of US$1468 versus US$1446.

In PPPs, the selection of green or non-green infrastructure projects relies heavily on the PPP discount rate chosen for the financial modelling of the project. The methodology that the industry applies for determining the PPP Discount Rate is the CAPM: the Risk-free Rate plus that portion of the Risk Premium. We will analyze in the next section how the industry calculates this risk premium as the compensation for the Systematic Risks of the project.

Calculating the risk premium charged by project investors under CAPM

The most well-known methodology that provides a framework for determining the risk premium of the project is the capital asset pricing model (CAPM).

The premise that underlies CAPM, in finance theory, is that the rate of return from an asset or investment should compensate owners for the risk that cannot be eliminated by diversification through investing in other assets. This type of risk is called "systematic risk" or "non-diversifiable risk." The systematic risk is a measure of the extent to which the infrastructure project's returns are likely to vary relatively more or less than a portfolio of similar projects across the market.

The measure of the systematic risk is known as Beta, and will vary from project to project. **The Beta determines the additional return that an investor would require to compensate them for investing in that project** and thereby taking on the systematic risk of that project.

On the other hand, **non-systematic**, also known as project-specific or diversifiable risk, can be diversified away by investors and accordingly **is not recognized in the discount rate**.[11]

Discount rate = risk-free rate + risk premium calculated with CAPM

$$\beta_a(R_m - R_f)$$

β_a = the project Beta, which reflects the degree that project returns expected to vary with returns of the market (i.e., a well-diversified portfolio of similar projects).

(Rm - Rf) = the market risk premium that investors would need or expect in order to invest in this industry related to the project.

BOX 8. EXAMPLE: DIFFERENCE BETWEEN SYSTEMATIC AND NON-SYSTEMATIC RISK UNDER THE CAPM

An ice cream producer sells ice creams on sunny days but not rainy days; an umbrella producer sells umbrellas on rainy days but not sunny days. Thus, an investor in each of these businesses individually faces risk from the weather. However, this risk can be diversified by investing in both businesses because there will be sales from the portfolio of businesses regardless of the weather.

On the other hand, it could be that sales of both ice creams and umbrellas are higher in economic booms and lower in recessions. This kind of risk cannot be diversified by investment in other assets, and so is non-diversifiable, or systematic.

The following paragraphs provide an example of the determination of the discount rate in an infrastructure project based on the CAPM. This example of a hospital project in New South Wales, Australia, offers a simplified four-step methodology to determine the projects PPP discount rate:

TABLE 5 STEP 1: DETERMINING SYSTEMATIC RISK OF A PROJECT

TYPE OF SYSTEMATIC RISK	DESCRIPTION	STATE	PROJECT COMPANY	SHARED
Demand risk	That element of demand risk that is related to the level of general economic activity affecting the demand for the Hospital (but not that element of demand risk related to performance of services by the Project Company).			✓
Inflation	Risk of unexpected inflation (which could be represented by unusually high or low CPI). That is, the risk that the real value of payments made during the term of the arrangements is eroded (or increased) by inflation with a diminution (or increase) in returns.			✓
Residual value	The risk that either on termination of the Project Deed, or during the course of delivery of the contractual arrangements the Hospital does not have the value originally forecast when the arrangements were established and the cost of services were priced.	✓		
Downturn in broader market	Risk of downturn caused by factors in the broader market, resulting in a reductionin the quality of the Project Company's service provision, or an increase in the Project Company's costs due to its own financial distress/ insolvency or that of its major contractors/subcontractors.			✓

Source: Appendix: Case study NSW Hospital. Discount Rate Methodology Guidance Australian National PPP Guidelines

[11] However, such risk should be reflected in the risk-adjusted project cash flows.

Step 2: Sharing of systematic risks

As the table above shows, there are a number of systematics risks in the hospital projects allocated between parties. In this project, the risk of the residual value being lower than forecasted was assumed by the state.

Step 3: Identify project Beta

The hospital in New South Wales was essentially an accommodation project with a significant operating component: maintenance, catering, cleaning, security, utility provision and materials handling services. For investment purposes, the project was classified as having "very low" systematic risk, thus it was indicated with a project Beta of 0.3.

Further research was conducted to generate empirical information that might serve as a basis for establishing a procurement Beta for the procurement decision. Research was done on Betas for listed corporations on the Australian Stock Exchange ASX that may lend comparable Beta data in terms of facilities management and/or similar infrastructure assets. The information can be found summarised in Table 5 below.

TABLE 6 RESEARCH ON BETAS, NSW CASE STUDY AUSTRALIA

CATAGORY	LOW ASSET BETA	HIGH ASSET BETA	MID POINT ASSET BETA	WEIGHTED AVERAGE ASSET BETA	ARITHMETIC AVERAGE ASSET BETA
Facilities Management	0.43	0.59	0.51	0.52	0.50
Energy (c)	0.05	0.36	0.20	0.27	0.24
Property Trusts	0.31	0.63	0.47	0.51	0.46
Property Development/Construction (b)	0.34	0.99	0.67	0.58	0.55
Overall	**0.28**	**0.64**	**0.46**	**0.48**	**0.44**

Source: Appendix: Case study NSW Hospital. Discount Rate Methodology Guidance. Australian National PPP Guidelines.

The market data above suggests that the hospital project Beta is in the range of 0.28 to 0.64. A hospital project has risk characteristics, such as a sole government customer, that would place it at the lower end of the range quoted. Accordingly, based on an understanding of the industries relevant to a typical PPP hospital contract and available market data, a project Beta of 0.45 is used. This translates into an estimated Project Risk Premium of 2.7 per cent.

The calculation for this is:

Project Risk Premium = $\beta_a (R_m - R_f)$

Beta * Market risk premium = 0.45 * 6.0% = 2.7%.

Step 4: Calculation of PPP Discount Rate

Once the project risk premium has been established, a subsequent methodology is used to determine the PPP Discount Rate. This methodology will take into consideration the risk sharing between the public and private sector and the weight of each systematic risk based on the level of importance for the hospital project. This procedure is important because the risk taken by the public sector is discounted using the risk free rate. Therefore, the percentage of risk that the government is holding needs to be deducted from the project risk premium of 2.7 per cent.

TABLE 7 ESTIMATED RISK PREMIUMS, NSW CASE STUDY AUSTRALIA

SYSTEMATIC RISK TYPE	COLUMN 1 WEIGHTING (SCALE 1-5)	COLUMN 2 ESTIMATED PORTION OF PROJECT RISK PREMIUM	COLUMN 3 ALLOCATION OF RISK BASED ON STEP 1 ANALYSIS	COLUMN 4 RISK PREMIUM TRANSFERRED TO PRIVATE SECTOR %
	Based on relative importance	Project Risk Premium is 2.7% (per Step 3)	0<= Number <= 1	Column 2 x Column 3
Demand	4.0	1.08%	0.1	0.11%
Inflation	3.0	0.81%	0.4	0.32%
Asset Residual value	1.0	0.27%	0.0	0.00%
Financial distress/insolvency	2.0	0.54%	0.9	0.49%
Total Premium	**10.0**	**2.7%**		**0.92%**

Source: Oxera Consulting, 2011.

Based on the above assessment of CAPM, the recommended PPP Discount rate for the hospital project should be the government Risk Free plus the Project Risk Premium of 0.92 per cent.

Discount rate = risk free rate + 0.92%

Analysis

As demonstrated above, CAPM is not the appropriate model for calculating the risk premium of sustainable infrastructure projects. There are many reasons why this is the case:

1. **High discount rates disadvantage green projects that accrue higher earnings at distance dates.** When discount rates are higher, future costs and benefits count for less due to the VfM in discounting cash flows. A high discount rate favour projects with benefits that accrue early. Lower discount rates encourage investors to adopt projects that offer returns at distant dates, like green projects. In green projects, discount rates calculated under CAPM associated will be typically higher, as it fails to recognise the benefits of good environmental and social performance in mitigating infrastructure project risk. **CAPM only considers systematic risks and disregards the possibility of mitigating environmental risks and achieving therefore a lower cost of capital.**
2. **Lack of similar projects in markets resembling the Indian to use in the portfolio for Beta determination.** The project Beta, which is the measurement of systematic risk in the project, is determined by the degree that the specific project returns are expected to vary to a well-diversified portfolio of similar projects. Since green infrastructure project are in their infancy in India, the determination of the Beta of the project lacks of a diversified portfolio of sustainable projects.
3. **Investors who are not able to build a fully diversified portfolio may require compensation for certain systematic risks.** The CAPM assumes that investors will, through the process of portfolio diversification, eliminate all the diversifiable risks. Thus, the model´s conclusion is that investors would not be rewarded with a higher return for taking on risks that they can eliminate through portfolio diversification. Systematic risks, on the other hand, cannot be eliminated through portfolio diversification. Investors need to be rewarded for taking on systematic risk—otherwise they would not invest. The amount of reward depends on how much risk they take on. This is summarized by the parameter Beta in the CAPM. Nevertheless, in reality, investors cannot always build a fully diversified portfolio and may require compensation for certain unsystematic risks, especially in the case of green infrastructure investments because of their various specific risks. Investments in low-carbon power generation projects may have a high degree of project specific risk, such as the level of wind resources available in a particular locality over the life of a wind farm investment. **These particular risks for green infrastructure make the CAPM unsuitable to the extent that investors require compensation for unsystematic risks.**

4. **Environmental risks as externalities are not embedded in the current classification of risks that represent a potential monetary loss on the project.** In the current PPP risk-assessment methodology, environmental risks are considered to belong to a separate category, with little relevance since they do not represent potential monetary losses for the project. Nevertheless, it is critical for an optimal risk-assessment methodology to recognize environmental risks that may have an influence on other types of risks for the project—which will jeopardize the profitability of the PPP. As chapter 3 has shown, **unmitigated environmental risk can increase the cost of the project, leading to the failure of the PPP for all partners**. By evaluating environmental risk into the risk premium, the CAMP gives no incentive to the PPP partners to mitigate those risks in order to achieve a lower cost of capital.

3. TOWARD A "GREEN" INFRASTRUCTURE ASSET-PRICING MODEL

There is a need for PPP partners to quantify the environmental and social risks influencing the NPV of the projects to ensure a sound risk assessment of all possible factors influencing the success of the project. As the Indian market becomes more sophisticated in quantifying environmental risk and mitigation, the clearer the business case for building sustainable infrastructure becomes. Moving in that direction, **it is fundamental to consider the environmental factors that have an impact in existing risk categories in asset pricing models**. The process to start identifying environmental risk in existing models is the following:

1) Include environmental and social factors in the project risk assessment.
The main categories of risks in a project may include (UNESCAP, 2011):

Construction and completion risks: Cost overruns are an example of this type of risk. The cost of completion will be fundamental to the financial viability of the project as the financial assumptions and ratios are all dependent on the assumed cost of construction of the project. The lenders will need some mechanism to manage the risk if the project company's cost of completion increases compared to that anticipated at financial close. The project company will also seek to lock in certain costs (such as those of commodities) as early in the project as possible, so as to limit price escalation. There are several reasons why a PPP can have a delay in construction. In India there have been several cases in which regulatory clearance delays of two to three years have led to cost escalations that made the project unviable. These clearances include environmental and social compliance, fundamental in the Indian context. Environmental clearances have proved to be a risk factor on the PPP viability analysis when they are ignored (Sinha, 2008).

Supply risk: This risk exists when raw materials and inputs are not supplied on time or are of low quality, or when there are price escalations of inputs. Under a PPP, this risk arises when the Special Purpose Vehicle (SPV) is not able to obtain the needed production; it is therefore important to measure the dependence of the project on certain raw materials in the feasibility analysis phase, including inputs such as water, sun, wind, among others. Natural capital scarcity plays a crucial role in these risks that might lead to monetary impacts if dependence on these resources (and their availability over the life span of the project) is not measured correctly. For an assessment of the dependency of the project on natural capital, a life-cycle analysis (LCA) can be used. This technique assesses the environmental impacts associated with all the stages of a project's life. LCAs can help compile an inventory of relevant energy and material inputs fundamental for the project (United States Environmental Protection Agency, 2010).

Sponsor risk: The ability of the private sponsor to deliver the project can be compromised in several ways. Damages to a firm's reputation are one of them. A large body of anecdotal evidence suggests that a company's environmental reputation can affect stock prices. Perhaps one of the most prominent examples is British Petroleum's (BP) oil spill incident in April 2010. This oil spill contaminated a large area of marine environment along the Gulf of Mexico, and stands as the largest offshore oil spill in United States history. On the day of the incident, BP's stock price was $59.5 (Flammer, 2012). By the end of June 2010, the stock price had dropped to US$28.90—about half of its pre-incident value. As this example illustrates, environmental reputation can have dramatic implications for stock prices. To mitigate sponsor risk, companies need to have good governance practices and transparency. Companies also need to be socially responsible and environmentally conscious to avoid reputational risk.

Demand risk: This risk is present when the consumer demand forecast may not meet actual consumer demand. A high forecast but low actual demand can lead to a failure on the PPP. Certainty of revenue streams is fundamental for the success of the PPP. Future forecasts of demand will be important to PPP partners considering the revenue prospects of the project. For example, PPP partners may wish to; review the demand profile for project off-take, in the context of the extent to which the project company will bear project risk and will be able to influence demand; examine demand projections and information on the historical willingness of consumers to pay tariffs and to pay such tariffs on time; look at prospects for growth, demographic movements, current tariffs

and projections of consumer attitudes towards paying increased tariffs; where tariffs are based on indices, look at projections of the future movement of such indices and their relation to actual costs, including operating costs, finance costs, capital expenditure requirements and other such costs; and review public, residential, commercial and industrial consumption and usage, actual and forecast, within the service area (World Bank, 2011).

Operating risk: The financial model and assumptions of the viability of the project are dependent on the projected costs of operations. If a cost increases, lenders will prefer a protection to the extent that it will impact the revenue stream. For instance, one of the key costs of operation in a power generation project will be the cost of the fuel, and in the case of a water treatment plant, the cost of power. The cost can be locked in, to some extent, through hedging and futures contracts and through input agreements. However, some costs may not be hedged and the lenders will want to limit them. For instance, the increased cost is reflected in the tariff calculation for the power or treated water. The other key risk in operations is performance. The lenders and other investors are likely to have chosen an experienced operator to operate the project but there will be risks associated with operations such as key pieces of the plant breaking down when they are out of construction warranty, and also if the project company fails to meet the performance requirements, and thus faces penalties or the risk of termination for default. The lenders will seek to mitigate these risks through warranties and **step-in rights**. Operation risks are also exposed to environmental regulations. On July 1, 2010, India introduced a nationwide carbon tax per metric tonne of coal both produced and imported into India (KPMG, 2013). High CO— emissions in the construction of an infrastructure project could lead to higher costs due to this tax. This brings up the case of green infrastructure for a lower operation expenditure compared to traditional infrastructure.

Financial risks: This risk arises when there is a change in interest and currency exchange rates, as well as in tax laws. Investments in the projects are often done in foreign currencies, yet project revenues are generally denominated in local currency. Where the exchange rate between the currency of revenue and the currency of debt diverge, the cost of debt can increase, often dramatically. Where revenues are to be earned in some currency other than that in which the debt is denominated, lenders will prefer the revenue stream be adjusted to compensate for any relevant change in exchange rate or devaluation. If this is not available, the lenders will prefer appropriately robust hedging arrangements or some other mechanism to manage currency exchange risk. Taxes as well play a crucial role in an increase of costs during the life of the project, and the developers need to take all possible regulatory changes into consideration. One example of this is the green tax implemented in India this year on a project's excess CO_2 emissions. Infrastructure projects that are not anticipating a possible increase in the cost due to this tax may face severe restructuring problems in the future.

Technology risk: New technology that cannot be compared against existing references is critical in determining a PPP's profitability. The clear identification of the specific technology risk in a clean energy infrastructure project allows for an early mitigation of risks, thus making it feasible for a PPP arrangement. The disadvantage of clean energy projects related to their high technology risk can be mitigated if the preference for cleaner technologies is emphasized in the PPP tender and technology specifications.

Political risk: This includes risks that will expose the PPP to revenue losses due to political changes or instability in a country. Instability affecting investment returns could stem from a change in government, legislative bodies, other foreign policy-makers or military control. For example, in the energy sector a change in government policy relating to energy subsidies is a political risk. An increase on fossil fuel subsidies jeopardizes the profitability of clean energy projects, while a reduction of fossil fuel subsidies or increase in renewable energy subsidies should encourage the PPP partners to invest in PPPs to take advantage. Energy sector risk factors affecting the PPP project have to be carefully considered.

Force majeure: Force majeure is generally intended to include risks beyond the reasonable control of the PPP partners that have a materially adverse effect on the profitability of the project. It is caused by unpredictable natural and human-caused events such as earthquakes, floods, civil wars, etc.

With the progress on global warming forecasts and reports, the risk evaluation can include the forecast effects on sea level or cyclonic activity if they will affect the profitability of the project. In the case of India, several effects of global warming, including steady sea level rise, increased cyclonic activity, and changes in ambient temperature and precipitation patterns, have affected (or are projected to affect) the country. Monitoring the region where the asset will be built and remain over the next 10 to 30 years should be a high priority in the risk assessment.

2) How environmental and social performance can mitigate traditional project risks categories.

In general, mitigation measures are available for most risks. An effective strategy in risk management is to consider suitable mitigation measures for risks at the project planning stage. The risk matrix in Table 5 shows some examples of possible mitigation measures against the risks.

TABLE 8 RISK MITIGATION STRATEGIES

CATEGORY OF RISK	DESCRIPTION AND LIKELY EFFECT	SUBCATEGORY ON ENVIRONMENTAL RISKS	MITIGATION MEASURES
Time overrun risk	Takes longer time to complete the project	Environmental and social compliance	• Technical competence and experience of EPC contractor and subcontractors • Government facilitating all clearances beforehand
Supply risk	Raw materials and inputs not supplied in time or in less quantity or of low quality/ price escalation of inputs	Natural capital scarcity	• Life-cycle analysis (LCA) • Contractual framework (provision for liquidated damages) • Secured supply source
Technology risk	New and untried technology, with unchecked performance against existing references	Clean energy technology	• PPP tender, design of specifications of the PPP
Operating risk	Factors negatively impacting operation and available capacity such as: increased cost of operation, lower capacity; nature and cost of operations and management (O&M); inefficient operation	Increase in operation expenditure due to environmental regulation	• Proven technology, technology transfer • Clear output specification • Independent/lender's engineer report • Guarantee by technology provider, EPC contractor • O&M contract • Sinking fund, maintenance reserve • Maintenance bond • Contractual framework (penalty regime) • Monitoring of CO_2 emissions
Demand/revenue risk	Insufficient demand and/or revenue (due to low demand, leakage, competing facilities, capacity, price setting, augmentation)		• Realistic demand studies, sensitivity analysis • Regular monitoring • Contractual framework • Price indexation • Long term offtake contracts
Change in tax rates		Green tax	• Sensitivity analysis to test the robustness of financial return • Compensation if such effects are discriminatory • Monitoring and reduction of CO_2 emissions
Sponsor risk	Changes in tax law or policy that have negative effect on the private party, its assets, or the project	Reputation risk	• ESG Disclosure • Transparency

Force Majeure/ Natural events	Flood, earthquake, cyclone etc.; closure of operation and negative effects on assets and project	Events due to global warming	• Long-term thinking on climate change forecasts • Robustness of cash flow • Provision of reserves • Contractual provisions to withstand effect of such periods • Relief for short-term close down
Political events	Change in law, expropriation, revocation of licenses, permits etc., civil disturbance, war, non-default termination of contract	New environmental standards and regulations	• Insurance for political risks (eg., Multilateral Investment Guarantee Agency , or MIGA) • Contractual protection • Provisions of compensation
Dispute between parties	Non-compliance of contract provisions or difference in interpretation of provisions	Disputes over environmental protection	• Detailed allocation of responsibilities in the contract • Define a dispute-resolution mechanism in the contract • Appropriate regulatory mechanism • Termination of contract clauses

Sources of information: IISD & ESCAP.

The table above shows some examples of the common risks and the mitigation measures that can be considered in a PPP project. It does not provide any exhaustive list of risks, their nature or mitigation measures. The recognition of all the risks related to the project could, in theory, increase the risk perception of the project, potentially leading to higher financing costs of the project. Nevertheless, if the exercise of a risk-assessment methodology goes hand in hand with the mitigation process, the increase in costs should be lower.

Recognizing environmental risks into the risk premium gives an incentive to the PPP partners to mitigate those risks to achieve a lower cost of capital. Enviromental risk mitigation is the ultimate goal for enviromental policy-makers. **The recognition of these environmental factors—which may have also monetary impact on the project—increases the awareness of PPP partners of their environmental exposure and encourages the application for environmental clearances.**

3) Allocate the risk to the most suitable stakeholder: The allocation of the risk between public and private sector has an effect on the discount rate. **The higher the amount of risk held by the public sector, the lower the discount rate will be**. The government's cost of borrowing is low because it can use its fiscal powers to repay loans. Because of these taxing powers, lenders to governments assume that the government is unlikely to default on repayment, leading to lower interest rates on borrowings.

Government then face a lower cost of debt. Thus **the risk taken by the government on the PPP will be discounted at the risk-free rate. However, this does not remove the risk from the project.** This only means that when negative events transpire, it is the taxpayer who is responsible for the risk.

In the case of green infrastructure, the public sector should take on several environmental risks, since they are significant in the early stages. Those risks translated to taxpayers will be repaid to them with better living conditions, lower CO_2 emissions and better infrastructure. This risk allocation will allow a lower risk perception for the project and will consequently crowd in private investors.

If India aspires to turn its infrastructure onto a more sustainable path, the role played by the government in taking most of the initial risks is essential.

4) Determination of the risk premium based on unmitigated risks held by the private partner. An extensive risk-assessment methodology considers all factors affecting the profitability of the project, including the environmental and social variables which may have a monetary impact across the lifecycle of the projects. Under this framework, the determination of the risk premium will be based on the unmitigated risks assumed by the PPP partner. **An accurate discount rate including the environmental and social variables, will consequently represent value for money for the Indian government since the financial modeling will be more robust for the government to make their procurement decision.**

4. CONCLUSIONS

As has been explained throughout this section, the capital asset pricing model (CAPM) is not the most appropriate tool for measuring a green infrastructure project's long-term gains. Environmental factors can have an effect on the profitability of the projects. There is a lack of consideration in the current project risk assessment methodology of factors with a long-term perspective, including environmental ones. This failure to recognize how strong environmental and social performance can mitigate a range of infrastructure project risk categories under the CAPM increases the risks associated with green projects.

A green asset pricing allows the recognizion of environmental risks by influencing the risk premium. By recognizing these environmental factors, which may have a monetary impact on the project, **PPP partners will be aware of their environmental exposure and the possible mitigations**. The consideration of the mitigations by the PPP partners will urge them to acquire environmental clearances and, consequently, to undertake measures to mitigate environmental risks.

Glossary of terms used in this section

Capital Asset Pricing (CAPM): An economic model for valuing stocks by relating systematic risk and expected return. Based on the idea that investors demand additional expected return (called the risk premium) if asked to accept additional risk.

Diversifiable Risk: Risk that is specific to an asset that may be reduced, or even eliminated by the use of diversification.

Project Beta: A measure of the systematic risk of an asset, which reflects the degree to which the project returns are expected to vary with returns of the infrastructure market as a whole.

PPP Discount Rate: Risk-free rate plus that portion of the systematic risk premium transferred to the private sector as compensation for the systematic risk borne by them.

Risk-Free Rate: the return on capital that investors demand on risk-free investments (that is, those that yield a constant return regardless of what is happening in the economy), and the accepted estimate for this is the long term public sector bond rate.

SECTION VI

Environmental and Social Safeguards of International Financial Institutions

SECTION VI – ENVIRONMENTAL AND SOCIAL SAFEGUARDS OF INTERNATIONAL FINANCIAL INSTITUTIONS

This report on sustainability safeguards for infrastructure in India provides a look at how environmental and social safeguards are operationalized by international financial institutions. To this end, this section describes the approach and implementation of such safeguards by three institutions that also play a role in the infrastructure sector in India:

- **International Finance Corporation**'s Sustainability Framework Policy and Performance Standards on Environmental and Social Sustainability.
- **The World Bank**'s environmental and social safeguard policies focusing on Performance Standards for Private Sector Activities.
- **Asian Development Bank**'s environmental and social safeguards.

In addition, the **Equator Principles**, a risk-management framework, are included due to their relevance in sustainable project financing through financial institutions.

Common to all of the three institution policies above (as well as the Equator Principles) is that they have been revising their frameworks in recent years and/or at present. The synchronous developments are not surprising given the linkages among their frameworks. The objective in undertaking the reviews has always been to ensure that the frameworks remain relevant (and become more so) in the changing international context. These have been characterized by rising awareness of social and environmental risks and their importance for development outcomes, greater importance of donor harmonization and in-country systems, and the changing financial landscape. The latter includes the rising significance of the private sector in financing projects, also through PPP arrangements.

1. INTERNATIONAL FINANCE CORPORATION

The International Finance Corporation's (IFC), part of the World Bank Group, is the largest global development institution focused exclusively on the private sector in developing countries (International Finance Corporation, 2013a). Policies are collectively determined by 184 member countries and are focused on providing investment services, advisory services and asset management to more than 100 developing countries. One of the strategic priorities of the IFC is to address climate change and ensure environmental and social sustainability.

The IFC considers risks related to environmental and social issues in infrastructure projects as potentially very costly in terms of delays to secure clearances and licenses, standstills, negative publicity and higher expenditures (International Finance Corporation, 2013b). The IFC recommends companies actively work and act to reduce, mitigate and manage these risks in order to benefit from higher performance in the longer term and enhanced value for money.

The IFC sees the private sector as playing a key role in advancing competitive solutions for sustainable development and in supporting the financing of these, as well as managing the downside risks and creating value for businesses (International Finance Corporation, 2013c). In addition, improvements in environmental, social and governance performance can lead to improved development impacts in developing countries.

The Sustainability Framework, originally adopted in 2006, articulates IFC's focus on sustainable development and is an integral part of the organization's approach to risk management. The Framework consists of

- The IFC Policy and Performance Standards on Environmental and Social Sustainability.
- The Guidance Notes to IFC Performance Standards.
- IFC Access to Information Policy.

This Framework promotes sound environmental and social practices, encourages transparency and accountability, and contributes to positive development impacts. This Framework consists of the eight Performance Standards listed in Box 9 below (International Finance Corporation, 2011).

BOX 9. THE IFC PERFORMANCE STANDARDS

1) Assessment and management of environmental and social risks and impacts

2) Labour and working conditions

3) Resource efficiency and pollution prevention

4) Community health, safety, and security

5) Land acquisition and involuntary resettlement

6) Biodiversity conservation and sustainable management of living natural resources

7) Indigenous peoples

8) Cultural heritage

Performance Standard 1 establishes the importance of integrated assessments to identify environmental and social impacts, risks, and opportunities of projects; effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them; and the client's management of environmental and social performance throughout the life of the project. Performance Standards 2 to 8 outline objectives and requirements to avoid, minimize, and where residual impacts remain, to compensate for risks and impacts to workers, affected communities, and the environment (International Finance Corporation, 2012a).

The Performance Standards assist IFC investment and advisory clients to manage and improve their environmental and social performance through a risk- and outcomes-based focus (International Finance Corporation, 2012b). Sought outcomes are described in the objectives of each of the eight standards, followed by specific requirements to achieve these throughout an investment's lifecycle. Through due diligence, monitoring, and supervision, the IFC aims to ensure that the business activities it invests in live up to the performance standards.

In 2012 a new edition of the Sustainability Framework was released, following a lengthy stakeholder consultation process and building on the original framework of 2006. The updated edition is meant to reflect changes in good practice for sustainability and risk mitigation since its previous version; it contains modifications on challenging issues such as supply-chain management, resource efficiency and climate change, and business and human rights (International Finance Corporation, 2013d).

In addition, the **Environmental, Health, and Safety (EHS) Guidelines** of the World Bank Group—of which the IFC is a part—are being revised in a three-year process begun in 2013 (International Finance Corporation, 2013e). The previous version of 2007 is being revised due to internal demand at the World Bank Group but also from external organizations, like financial institutions and Export Credit Agencies, that use the Guidelines, including the Equator Principles. The objective is for them to reflect current international good practices, to align with World Bank Group Sector Strategies, including the 2012 Environment Strategy (The World Bank, 2012a) and to ensure consistency with the 2012 IFC Sustainability Framework in relation to emergency preparedness and response, occupational health and safety, resource efficiency and pollution prevention, modernization and retrofitting of existing facilities, greenhouse gases emissions reductions, pollution prevention, wastes, pesticides use and management, community health and safety, infrastructure and equipment design and safety, among others.

2. WORLD BANK

The World Bank's environmental and social safeguard policies are part of the organization's support for sustainable poverty reduction and the prevention and mitigation of harm to people and their environment in the development process. The World Bank has contributed to the expansion of policy analysis of environmental issues at the country and sector levels through its use of strategic environmental assessment (SEA) approaches that integrate environmental and social considerations into policies, plans and programs (World Bank, 2013a). The World Bank safeguard policies act as guidelines for the Bank and borrowers in the identification, preparation, and implementation of programs and projects (World Bank, 2012b). The 10 broad policies are on: environmental assessments, cultural property, disputed areas, forestry, indigenous peoples, international waterways, involuntary resettlement, natural habitats, pest management, and the safety of dams. Proposed projects are screened in order to determine the appropriate extent and type of environmental assessments to be undertaken and whether or not the project may trigger other safeguard policies (World Bank, 2013b).

The bank classifies proposed projects into one of the four categories below depending on the type, location, sensitivity, and scale of the project and the nature and the extent of its potential environmental impacts (similar to the categorization by the Asian Development Bank, described below) (The World Bank, 2013c):

- Category A for business activities with potentially significant adverse environmental or social risks and/or impacts that are diverse, irreversible, or unprecedented.
- Category B for business activities with potentially limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.
- Category C for business activities with minimal or no adverse environmental or social risks and/or impacts.
- Category FI for activities that involve support, through financial intermediaries, of initially unspecified subprojects that may result in adverse environmental or social risks and/or impacts.

For World Bank projects, borrowers are responsible for conducting the appraisals required by safeguard policies. The bank provides general advice, if needed, and monitors compliance with the policies, generally through its Quality Assurance and Compliance Unit of the Environmental and Socially Sustainable Development Network.

World Bank-financed or supported projects owned, constructed or operated by the private sector are, since June 2012, subject to the World Bank Performance Standards, instead of the above World Bank environmental and social safeguard policies (World Bank, 2012c). This concerns technical assistance in PPPs as well as (intermediary) financing of long-term management contracts, leases, privatizations, concessions, build-own-transfer (BOT) projects. The eight World Bank Performance Standards are the same as those outlined for the IFC's above.

These are outlined in the World Bank Operational Policy *4.03 Performance Standards for Private Sector Activities* where financing for private sector-led economic development projects is described. This is carried out through the application of environmental and social policy standards while enhancing greater policy coherence and cooperation across the World Bank Group. In parallel, the *Bank Procedures 4.03 Performance Standards for Private Sector Activities* describe the environmental and social review procedures required for a Bank-supported private sector activity for which the performance standards apply in accordance with OP 4.03.

3. ASIAN DEVELOPMENT BANK

The Asian Development Bank's (ADB) safeguard policy is aimed at helping developing member countries to address environmental and social risks in development projects and minimize and mitigate adverse impacts on people and the environment (Asian Development Bank, 2013a).

The operational policies of the ADB include three on safeguards: the Involuntary Resettlement Policy of 1995, the Policy on Indigenous Peoples of 1998, and the Environment Policy of 2002, accompanied by the Operations Manual sections on Environmental Considerations in ADB operations (Asian Development Bank, 2006a), involuntary resettlement (Asian Development Bank, 2006b), and indigenous peoples (Asian Development Bank, 2006c). In addition, the ADB's *Handbook on Resettlement and Environmental Assessment Guidelines of 2003* provides information on good practice approaches to implementing safeguards.

The above policies consist of structured processes for impact assessment, planning, and mitigation to address the negative effects of projects throughout their project cycles. The policies require: impacts to be identified and assessed early on in the projects' life; plans to avoid, minimize, mitigate, or compensate for potential negative impacts to be developed and implemented; and that affected people are informed and consulted during project preparation and implementation. The safeguard policies apply to all ADB-financed projects, including private-sector operations (Asian Development Bank, 2009).

The ADB's *Safeguard Policy Statement* of 2009 governs environmental and social safeguards in ADB operations and consolidates the three previous safeguards into a single policy framework (Asian Development Bank, 2009). Since early 2010 it is applicable to all ADB-supported projects. Key objectives of the Safeguard Policy Statement are to:

- Avoid negative impacts of projects on the environment and affected people.
- Minimize, mitigate, and/or compensate for negative project impacts on the environment and affected people when avoidance is not possible.
- Help borrowers or clients strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

While determining potential environmental and social impacts of projects on the environment, involuntary resettlement and indigenous peoples, ADB screens projects according to their type, location, scale, and sensitivity and magnitude of potential environmental impacts, including direct, indirect, induced, and cumulative impacts.

For projects involving involuntary resettlement, a resettlement plan is prepared that is commensurate with the extent and degree of the impacts: the scope of physical and economic displacement and the vulnerability of the affected persons.

Just as the World Bank (see above), the ADB uses a classification system (ranging from "A," "B" or "C") reflecting the most to least significant potential impacts of a project on the environmental. A project's category is determined by the category of its most environmentally sensitive component. Another category, "FI," consists of proposed projects that involve the investment of ADB funds to or through a financial intermediary. The financial intermediary must apply and maintain an environmental and social management system, unless all of the financial intermediary's business activities have minimal or no environmental impacts or risks.

In projects with ADB participation each party involved has defined roles (Asian Development Bank, 2009). The ADB:

- Screens projects to specify its safeguard requirements.
- Undertakes due diligence.
- Reviews the borrower's or client's social and environmental assessments.
- Determines the feasibility of ADB financing.
- Helps the borrower or client in building capacity to deliver the safeguards.
- Monitors and supervises the borrower's or client's social and environmental performance throughout the project cycle.

The borrower or client:

- Undertakes environmental and social impact assessments.
- Prepares safeguard plans.
- Engages with affected communities through information disclosure, consultation, and informed participation following all policy principles and safeguard requirements.
- Submits all required information, including assessment reports, safeguard plans and monitoring reports to ADB for review while also complying with host country laws, regulations, and standards, including host country obligations under international law.
- Implements safeguard measures agreed with the ADB to deliver on the policy principles and meet the requirements specified in the Safeguard Requirements.

The ADB has four main Safeguard Requirement areas:

1. **Environment:** To ensure the environmental soundness and sustainability of projects, and to support the integration of environmental considerations into the project decision-making process. The Safeguard Policy Statement (SPS) requires borrowers to identify project impacts and assess their significance; examine alternatives; and prepare, implement, and monitor environmental management plans. The SPS requires borrowers to consult people likely to be affected by the project and disclose relevant information in a timely manner and in a form and language understandable to those being consulted (Asian Development Bank, 2013b).
2. **Involuntary Resettlement:** To avoid involuntary resettlement wherever possible; to minimize involuntary resettlement by exploring project and design alternatives; to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups. Safeguards call for meaningful consultation with affected people; compensation of losses and provision of assistance to and benefit sharing with displaced persons, and special measures for the poor and vulnerable. Involuntary resettlement safeguards also require the preparation, implementation, and monitoring of time-bound resettlement plans (Asian Development Bank, 2013c).
3. **Indigenous Peoples:** To ensure that the design and implementation of projects foster full respect for indigenous peoples' identity, dignity, human rights, livelihood systems, and cultural uniqueness as defined by the indigenous peoples themselves so that they receive culturally appropriate social and economic benefits, are not harmed by the projects, and can participate actively in projects that affect them.

   For a project with impacts on indigenous peoples, the Safeguard Policy Statement (SPS) requires borrowers to carry out meaningful consultation and to prepare and implement an indigenous peoples plan. The plan includes measures to ensure that indigenous peoples benefit, and that adverse impacts are prevented, or where this is not possible, mitigated. The SPS requires that the broad community support of affected indigenous peoples' communities be ascertained for project activities to which indigenous peoples are deemed particularly vulnerable (Asian Development Bank, 2013d).
4. **Special Requirements for Different Finance Modalities:** In addition to standard project loans, ADB provides a variety of investment instruments, including program loans, sector finance, multi-tranche financing facilities, emergency assistance loans, financial intermediaries and corporate finance. These safeguard requirements outline the special obligations for different finance modalities that borrowers or clients are requested to meet (Asian Development Bank, 2009).

ADB conducts safeguard reviews, including reviews of the borrower's or client's safeguard documents, as part of due diligence and emphasizes environmental and social impact assessments and the planning process, in addition to safeguard documentation and also involves field visits and desk reviews.

ADB and the borrower or client have their own separate monitoring responsibilities determined by the project's risks and impacts. Local grievance redress mechanisms and accountability mechanisms are also in place to address any grievances or complaints.

4. EQUATOR PRINCIPLES

The Equator Principles (EPs) are a risk-management framework, adopted by financial institutions to determine, assess and manage environmental and social risk in projects (Equator Principles, 2013a). The EPs are primarily intended to provide a minimum standard for due diligence to support responsible risk decision making, especially in the current context of negative social and environmental impacts from infrastructure and industrial projects.

The EPs emphasize social and community standards and responsibility, including robust standards for indigenous peoples, labour standards, and consultation with locally affected communities within the project finance market, alongside promoting the cohesive merging of common environmental and social standards (Equator Principles, 2013b).

These principles, as listed in Box 10 below, are voluntarily adopted by Equator Principles Financial Institutions (EPFIs) and are applicable globally, to all industry sectors. They are applied to four specific financial products: 1) project finance advisory services, 2) project finance, 3) project-related corporate loans, and 4) bridge loans. Once adopted, the adopting entity is required to take all appropriate steps to implement and comply with the EPs in their internal environmental and social policies, procedures and standards for financing projects. At present, there are officially 78 adopting financial institutions (77 EPFIs and 1 Associate) in 35 countries, covering over 70 percent of international project finance debt in emerging markets (Equator Principles, 2013c).

BOX 10. THE EQUATOR PRINCIPLES

1) Review and Categorization: When a project is proposed for financing, the Equator Principles Financial Institution (EPFI) will categorise it as "A," "B" or "C" based on the magnitude of its potential environmental and social risks and impacts. Such screening is based on the environmental and social categorization process of the IFC (as also used by the World Bank and ADB).

2) Environmental and Social Assessment: For all Category A and Category B Projects, with more significant adverse environmental and social risks, the EPFI requires the client to conduct an assessment process to address the relevant environmental and social risks and impacts of the proposed project. For Category A, and as appropriate, Category B Projects, the assessment Documentation includes an environmental and social impact assessment (ESIA).

3) Applicable Environmental and Social Standards: The assessment process is required to address compliance with relevant host country laws, regulations and permits related to environmental and social issues.

4) Environmental and Social Management System and Equator Principles Action Plan: For all Category A and B projects, the EPFI requires the client to develop or maintain an environmental and social management system. This is to be prepared by the client to address issues raised in the assessment process and incorporate actions required to comply with the applicable standards. Where these are not met to the EPFI's satisfaction, the client and the EPFI agree on an Equator Principles Action Plan. The Plan is intended to outline gaps and commitments to meet EPFI requirements in line with the applicable standards.

5) Stakeholder Engagement: For Category A and B projects, the EPFI requires clients to demonstrate effective stakeholder engagement as an ongoing process in a structured and culturally appropriate manner with affected communities and relevant stakeholders. For projects with potentially significant adverse impacts, the client is to conduct an informed consultation and participation process.

6) Grievance Mechanism: For all Category A (and, where relevant, Category B) projects, the EPFI requires the client, as part of the environmental and social management system, to establish a grievance mechanism designed to receive and facilitate resolution of concerns and grievances about environmental and social performance.

7) Independent Review: For all Category A and relevant Category B Projects, an independent environmental and social consultant, not directly associated with the client, will carry out a review of the assessment documentation including the environmental and social management plan, the environmental and social management system, and the stakeholder engagement process documentation for project finance and projects with any adverse impacts on indigenous peoples, critical habitat impacts, significant cultural heritage impacts and large-scale resettlement in order to assist the EPFI's due diligence, and assess compliance with Equator Principles.

8) Covenants linked to compliance: For all projects, the client is required to covenant in the financing documentation to comply with all relevant host country environmental and social laws, regulations and permits in all material respects.

9) Independent monitoring and reporting: For Project Finance, the EPFI requires the appointment of an Independent Environmental and Social Consultant, or that the client retain qualified and experienced external experts to verify its monitoring information, which is to be shared with the EPFI. For project-related corporate loans where an independent review is required under Principle 7, the EPFI requires the appointment of an Independent Environmental and Social Consultant after Financial Close, or requires that the client retain qualified and experienced external experts to verify its monitoring information, which would be shared with the EPFI.

10) Reporting and transparency: EPFI reporting requirements are in addition to the disclosure requirements in Principle 5. For all Category A and relevant Category B projects clients are required to make a summary of the ESIA accessible and available online and publicly report GHG emission levels (combined Scope 1 and Scope 2 Emissions) during the operational phase for Projects emitting over 100,000 tonnes of CO_2e annually. The EPFI will publicly report, at least annually, on transactions that have reached financial close and on its Equator Principles implementation processes and experience.

Source: Equator Principles, 2013b.

The EP framework was first launched in 2003 and revised in 2006. Their third version, the EP III, has been effective since June 2013. The reviews have been driven by the growing number of EP adopters and the evolution in environmental and social risk management practices as well as the aim to ensure that the EP remain relevant, practical and supportive of sustainable financing objectives (Equator Principles, 2013d). The latest review was emerged from a strategic review resulting in recommendations in key thematic areas—scope, climate change, human rights, reporting and transparency, stakeholder engagement and governance. It was also influenced by the IFC's review and update of its Sustainability Framework and Performance Standards (described above), which underpin the EP that were re-launched in January 2012. Key changes in the EP III include:

- The inclusion of project-related-corporate loans and bridge loans to the scope of the EP.
- Higher minimum requirements for public reporting.
- Changes to align with the updated IFC Performance Standards.
- Addition of a formalized approach for EP Association Members to share information related to environmental and social matters with other mandated financial institutions.

EP Association Members have a transition period from June 2013 to December 2013 to implement EP III for all products in the Scope—project finance, advisory, bridge loans and project-related corporate loans. EP III is to be applied to all new transactions as of 2014.

SECTION VII

Voluntary Sustainability Standards for Indian Infrastructure

SECTION VII – VOLUNTARY SUSTAINABILITY STANDARDS FOR INDIAN INFRASTRUCTURE

This section presents an overview of voluntary sustainability standards relevant to the Indian infrastructure context. One of the central recommendations of this report is the incorporation of environmental and social performance requirements in RfPs and other tender documentation. Authorities procuring infrastructure can draw on the requirements of these standards as baselines for environmental and social performance.

Indian industry has a long tradition of compliance with voluntary standards, as demonstrated by the 19,000 standards promoted by the Bureau of Indian Standards and the fact that more than 350 new and revised standards are published each year (BIS, 2013). It is also noteworthy that ISO 9001 Quality Management Certification in India is ranked the eighth highest in the world (ISO, 2013a).

For sustainability standards, however, the picture is more mixed with strong uptake in some areas and little diffusion in others. However, more systematic uptake can be expected given in light of the revised Companies Act, 2013 which encourages large companies to dedicate 2 percent of average net profit in the previous three years to CSR activities. In addition, the *National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business* published by the Ministry of Corporate Affairs in 2011 makes sustainability reporting mandatory for the top 100 listed companies under the Securities and Exchange Board of India.

The sustainability standards discussed in this section are not exhaustive. The discussion is based on standards that are most applicable to the infrastructure sector including samples of both performance and management standards. A summary is provided in the table below.

TABLE 9 OVERVIEW OF SUSTAINABILITY STANDARDS WITH RELEVANCE FOR INFRASTRUCTURE SECTORS IN INDIA (BY TYPE)

TYPE AND NAME OF STANDARD	PUBLISHED BY, YEAR	SCOPE	UPTAKE IN INDIA
Environmental & energy management			
ISO 14000 series	International Organization for Standardization, various years	Around 30 standards on various aspects of environmental management providing tools for all types of organizations to identify and control their environmental impact: ISO 14001 is on environmental management systems, other 14000 series standards are on env. assessment of sites and organizations, env. labels and declarations, env. post production environmental assessment, env. performance evaluation, Life Cycle Assessments, terms and definitions, env. impact goals, env. communication, and the measuring/quantifying/reducing of greenhouse gas emissions.	Uptake data is particularly precise for ISO 14001: 4,263 certificates had been distributed by the end of 2012 in India, out of 285,844 worldwide (1.49% share).
Environmental Codes of Practice (ECoP)	Gov. of India, Rural Roads Development Agency - Ministry of Rural Development, 2013 (most recent)	Environmental management standards to mitigate numerous potential negative environmental impacts from rural road construction projects covering road planning, implementation, and operation and recommending practices throughout that are cost-effective and address environmental impacts and involve local communities, while improving rural connectivity.	ECoPs have been applied in various World Bank-funded projects in the states of Himachal Pradesh, Jharkhand, Meghalaya, Punjab, Rajasthan, Uttarakhand, Uttar Pradesh, Bihr, Jammu & Kashmir, Mizoram, Arunachal Pradesh.
ISO 50001	International Organization for Standardization, 2011	Energy management framework for all entities in all sectors with requirements and guidance for establishment, implementation, maintenance and improvement of energy management systems to systematically improve energy performance, covering energy efficiency, use and consumption.	45 certificates distributed in India by the end of 2012 of 1,981 worldwide (2.27% share).

CSR			
National Voluntary Guidelines on Social, Environmental & Economic Responsibilities of Business	Gov. of India, Ministry of Corporate Affairs, 2011	Domestically developed reporting and disclosure framework adapting international best practice with the objective to mainstream CSR across the economy providing increasing companies' competitiveness, reputation, attractiveness to talent, and investor relations.	No overall figures available; reporting under the NVGs mandatory for the largest listed companies by the Securities Exchange Board of India; In 2013: 73 of 100 largest companies issued CR reports (53 percentage points higher than 2011 before mandatory reporting)
ISO 26000 Guidance on social responsibility	International Organization for Standardization, 2008 (latest version in 2010)	Guidance, operationalization and dissemination of best practices in social responsibility for all types of organizations; not certifiable; covering: organizational governance, human rights, labour practices, environment, fair operating practices, consumer issues, community involvement and development.	No reliable numbers on uptake in India, but relevant for Indian context.
Social Accountability 8000	Social Accountability International, 1997	Auditable social certification standard for operationalizing decent work in all industrial sectors; code of conduct on working conditions incorporating principles of 13 ILO/other human rights conventions, national law and corporate and industry codes; covers: child labour, forced labour, health & safety, freedom of association & collective bargaining, discrimination, disciplinary practices, working hours, remuneration, management systems.	SA8000 certification in India is among the highest in the world. As of Q2 2013, second rank globally for certified facilities: 733 of world total of 3349 (21.9% share); and first for employees in certified facilities: 482,191 of 1,915,853 (25% share)
AccountAbility 1000 series	AccountAbility, 2008/2011	Principles-based standards to assist in organizations' accountability, responsibility and sustainability, covering issues around governance, business models, organizational strategy, sustainability assurance and stakeholder engagement, supporting integrated reporting and assurance of many types of organisations; AA1000APS AccountAbility Principles Standard is a framework to identify, prioritise and respond to sustainability challenges; AA1000AS Assurance Standard is a methodology to evaluate adherence to the AccountAbility Principles; AA1000SES Stakeholder Engagement Standard is a framework to ensure stakeholder engagement processes are purpose driven, robust and deliver results	No precise data on uptake; 11 licensed AA1000AS Assurance Providers in India (of approximately 160 in total).
Buildings code			
Energy Conservation Building Code	Gov. of India, Bureau of Energy Efficiency, 2007	Voluntary national building energy code for India with minimum energy efficiency requirements for building envelopes, lighting, HVAC, electrical systems, water heating and pumping systems.	Mandatory adoption is planned by central and state governments; already mandating ECBC: Delhi, Maharashtra, Uttar Pradesh, Haryana, Karnataka, Tamil Nadu, Andhra Pradesh, West Bengal, Rajasthan, Orissa, Gujarat.
Infrastructure assessment & certification			
Indian Green Building Council Ratings Systems	Indian Green Building Council (IGBC), various years	IGBC offers a series of rating systems for buildings and other urban structures addressing water, energy efficiency, natural resources, waste, and occupant health: Existing Buildings (O&M), Green Homes, Green Townships, Green SEZs, Green Factory Buildings, Green Landscapes, LEED India for New Construction, and LEED India for Core and Shell.	Shift of major developers towards green buildings; 427 IGBC-rated green buildings, a further 2,285 buildings are registered for being rated in the future, making up 1.72 billion sq.ft "green building footprint"; IGCB has 1,664 members and 1,147 accredited professionals.

Envision Sustainable Infrastructure Rating System	Harvard University & Institute for Sustainable Infrastructure, 2011	Holistic framework for reviewing, grading, and recognizing projects, applicable to any infrastructure sector (except buildings), covering: quality of life, leadership, resource allocation, the natural world, and climate and risk in 60 criteria.	None; Substantial uptake in the United States (designed for use there), but relevant and adaptable to India.
Infrastructure Sustainability Rating Tool	Infrastructure Sustainability Council of Australia, 2013	Comprehensive sustainability registration, assessment, verification, and certification of projects applicable in any infrastructure sector with ratings for design, "as built," and operation, covering: Management & Governance; Using Resources; Emission, Pollution & Waste; Ecology; People & Places; and Innovation.	None; designed for Australian context, but relevant and adaptable to India.
Greenroads Rating System	University of Washington (U.S.) & Greenroads Foundation, 2010 (last version 2011)	Rating system for roadway design and construction with recognition scheme; with requirements including environmental reviews, LCC, waste and pollution, and voluntary credits in: Environment & Water; Access & Equity; Construction Activities; Materials & Resources; and Pavement Technology.	None; designed for the U.S. context, but relevant and adaptable to India.
Standards for emission offsetting and trading			
CDM methodologies	United Nations Framework Convention on Climate Change (UNFCCC)	Various Clean Development Mechanism (CDM) methodologies are employed to determine the amount of Certified Emission Reductions (CERs), equivalent to reducing one tonne of CO2, generated by a mitigation project, e.g. in renewable energy, energy efficiency, waste, cement or transport.	India has issued 188.6 million CERs (13.4% of the worldwide total) through 2,097 projects, 1,411 of which in wind, hydro and solar energy.
Timber			
Forest Stewardship Council (FSC)	Forest Stewardship Council, 1993	Principles and criteria for best practices in forest management, translated to specific regional and national standards, and chain of custody (CoC) certification.	No data on FSC building material uptake in India; For all types of materials, worldwide as of Dec. 6, 2013 188.176 million hectares certified, 27,228 CoC, and 1,245 forest management/CoC certificates issued.

1. ENVIRONMENTAL & ENERGY MANAGEMENT

ISO 14000 suite of environmental management standard, published by the International Standards Organization, revised in 2004

In the ISO 14000 suite of standards, ISO 14001, released in 1996 and last revised in 2004, has become the global standard for certifying commitment to environmental management, setting out a framework for companies and other organizations of all types and sizes to develop an environmental management system (ISO, 2009). The standard itself does not set specific measures or targets, but provides the overall framework to help companies set up, measure and comply with their own environmental objectives and regulatory requirements. The table below provides an overview of the requirements under ISO 14001.

TABLE 10 OVERVIEW OF ISO 14001 REQUIREMENTS

REQUIREMENT TITLE & NUMBER	DESCRIPTION
4.1 General requirements	Establish, document, implement, and continually improve an environmental management system (EMS) and meet all the requirements.
4.2 Environmental Policy	A policy, or commitment statement, developed by top management relative to the scope of the EMS conforming to the standard.
4.3. Planning	
4.3.1 Environmental Aspects	A procedure to identify environmental impacts of the organization and identification of significant ones to the organization.
4.3.2 Legal and Other Requirements	A procedure for the organization to obtain information on its legal and other requirements and informing key functions within the organization about them.
4.3.3 Objectives, Targets, and Programs	A process that ensures that objectives and targets are consistent with the environmental policy, including the commitments to compliance with legal and other requirements, continuous improvement, and pollution prevention, taking into account significant aspects, legal and other requirements, and the views of interested third parties, and technological, financial, and business issues in setting its objectives.
4.4 Implementation & Operation	
4.4.1 Structure and Responsibility	A management and accountability structure and available resources for EMS implementation and improvement.
4.4.2 Competence, Training, and Awareness	Adequate education, training, and/or experience of personnel.
4.4.3 Communications	Procedures for internal and external communications.
4.4.4 EMS Documentation	Documentation of the EMS
4.4.5 Control of Documents	Control documents, including system procedures and work instructions, to ensure their relevance.
4.4.6 Operational Control	Critical functions related to various elements above are identified and procedures and work instructions established for correct execution of activities.
4.4.7 Emergency Preparedness and Response	A process exists for identifying and mitigating potential emergencies.
4.5 Checking	
4.5.1 Monitoring and Measurement	Monitoring of the EMS' performance, including key parameters of operations, to properly manage and improve it.
4.5.2 Evaluation of Compliance	Procedures to periodically evaluate compliance with legal and other requirements.
4.5.3 Non-conformances, Corrective and Preventive Action	Procedures for cases of non-conformance, including corrective and preventive action.
4.5.4 Control of Records	Procedures for the maintenance of records on the EMS' operation and conformance EMS requirements.
4.5.5 Internal Audit	Processes for conducting internal audits.
4.6 Management Review	A periodic review of the EMS to ensure it is operating as planned, and is suitable, adequate, and effective.

Source: Author's elaboration based on ISO, 2004.

Other standards in the ISO 14000 family include:

- ISO 14004 Environmental management systems - General guidelines on principles, systems and support techniques; this standard complements ISO 14001 by providing additional guidance for the development and implementation of Environmental Management Systems.
- ISO 14006 Environmental management systems - Guidelines for incorporating ecodesign.
- ISO 14015 Environmental assessment of sites and organizations.
- ISO 14020 series (14020 to 14025) Environmental labels and declarations.
- ISO 14030 on post-production environmental assessment.
- ISO 14031 Environmental performance evaluation – Guidelines.
- ISO 14040 series (14040 to 14049), Life Cycle Assessment, on pre-production planning and environment goal setting.
- ISO 14050 on environmental terms and definitions.
- ISO 14062 discusses making improvements to environmental impact goals.
- ISO 14063 Environmental communication - guidelines and examples.
- ISO 14064 Measuring, quantifying, and reducing greenhouse gas emissions.
- ISO 19011 specifying a joint audit protocol for 14001 and 9000.

Data on uptake is most available for ISO 14001. In India, 4,263 ISO 14001 certificates had been distributed by the end of 2012 out of a worldwide total of 285,844 (ISO, 2013b). By comparison, in 2002, the figure for India was 605 certificates. At least part of the driver for the rise in uptake has been a context marked by weak regulatory enforcement in which companies vie for international investment (Chavan & Naik, 2012). International investors, in turn, want to protect themselves against environmental liabilities, leading for demand of such ISO certification. In addition, exporting to the mature markets Europe and Japan increasingly requires ISO 14001 certification. ISO 14001 certifications are undertaken by the governmental Bureau of Indian Standards (BIS) and accreditation by the governmental Quality Council of India.

Environmental Codes of Practice published by the Indian Rural Roads Development Agency of the Indian Ministry of Rural Development, revised in 2013

Environmental Codes of Practice (ECoPs) are used as environmental management standards in India to mitigate negative environmental impacts from rural road construction in World Bank- and ADB-funded projects and are part of a project's Environmental and Social Management Framework. Their provisions are drafted in accordance with statutory provisions of the Government of India and in compliance with World Bank/ADB Policies. They are published by the Rural Roads Development Agency of the Ministry of Rural Development. In their latest version in August 2013, ECoPs cover the areas in the table below. For each ECoP, detailed technical requirements are specified.

TABLE 11 OVERVIEW OF ENVIRONMENTAL CODES OF PRACTICE (ECOPS)

ECoP 1.0	Project Planning and Design	ECoP 11.0	Water Bodies
ECoP 2.0	Site Preparation	ECoP 12.0	Drainage
ECoP 3.0	Construction Camp Management	ECoP 13.0	Construction Plants & Equipment Management
ECoP 4.0	Alternate Materials for Construction	ECoP 14.0	Public and Worker's Health & Safety
ECoP 5.0	Borrow Areas	ECoP 15.0	Cultural Properties
ECoP 6.0	Topsoil Salvage/Storage/Replacement	ECoP 16.0	Tree Plantation
ECoP 7.0	Quarry Management	ECoP 17.0	Managing Induced Development
ECoP 8.0	Water for Construction	ECoP 18.0	Environmental Audit
ECoP 9.0	Slope Stability and Erosion Control	ECoP 19.0	Biodiversity Management
ECoP 10.0	Waste Management	ECoP 20.0	Consultation Framework

Source: Author's elaboration based on World Bank, 2013.

The scope of the ECoPs is described as: A field guide/manual to planners, field engineers and contractors to help them (National Rural Roads Development Agency, 2008):

- Identify the project activities that can have potential environmental impacts and to provide mitigation measures.
- Demonstrate the road design and construction practices that are cost-effective and address environmental impacts.
- Illustrate the recommended practices to address the environmental concerns during project planning, implementation and operation.
- Define the role of involvement of the rural communities at different stages of the project.
- Achieve the objectives of rural connectivity through roads planned and constructed to blend with the natural surroundings.

The ECoPs are designed to be implemented in an integrated fashion jointly with existing statutory documents (National Rural Roads Development Agency, 2008). Where ECoPs' provisions address environmental issues that are also covered in existing codes/specifications, these are included and referenced in the ECoPs instead of drafting new codes. The objective is to ease the task for the implementing agency. In case of conflict between the ECoPs and existing codes/specifications, the latter prevail.

The ECoPs, in their various versions, have been used in a range of World Bank-funded rural road development projects (World Bank, 2013). These include: The Rural Roads Project, which ran until 2012 in the states of Himachal Pradesh, Jharkhand, Rajasthan and Uttar Pradesh, under which the ECoPs were first developed; the Pradhan Mantri Gram Sadak Yojana (PMGSY)[12] rural roads project in Himachal Pradesh, Jharkhand, Meghalaya, Punjab, Rajasthan, Uttarakhand, Uttar Pradesh, Bihr, Jammu & Kashmir, Mizoram and Arunachal Pradesh; and the Rajasthan Rural Connectivity Project (RRCP).[13]

Due to their comprehensiveness in addressing different environmental impacts, their level of technical detail and their practical usefulness, it would be desirable to adapt ECoPs for use in many other types of road projects and even other infrastructure sectors, where these do not yet exist.

ISO 50001 Energy Management Systems, 2011, published by the International Standards Organization.

ISO 50001:2011 is the ISO standard for energy management systems. Such systems can help companies gain clarity on energy consumption in their internal processes and where efficiencies—and thus cost savings—can be reaped (ISO, n.d.; 2011). The voluntary standard provides requirements and guidance for energy management systems including their establishment, implementation, maintenance and improvement. The standard establishes an energy management framework that enables entities across all sectors to systematically improve energy performance, covering energy efficiency, use and consumption. The standard does not prescribe concrete performance levels that must be reached. Being suitable for large and small, and public and private organizations, based on International Energy Agency data, ISO estimates that the standard "could influence up to 60% of the world's energy use" (ISO, 2011). Conformity with the standard is verified either though self-declaration or by third-party certification.

According to the ISO, by the end of 2012, 45 ISO 50001 certificates had been distributed in India, and 1,981 worldwide (ISO, 2013b). By comparison, the figure for India stood at 25 at the end of 2011, the year when the standard was introduced. With the increase in forecast energy demand in the coming decades driven largely by China and India, the potential for energy efficiency through management systems is huge in India. A substantial share of this will be from large infrastructure projects in energy but also buildings, ports and airports, communication networks and others. Technological parks are another area with large potential. In 2011, a major IT park received ISO 50001 certification in Chennai, Tamilnadu.[14] ISO 50001 is a young standard with an early successful track record, with a limited uptake in India so far. This is a trend that should be encouraged further to fully reap the benefits.

[12] See: http://pmgsy.nic.in/nrrda.asp
[13] See: http://www.worldbank.org/projects/P130164/rajasthan-road-sector-modernization-project?lang=en&tab=overview
[14] http://in.grundfos.com/cases/find-case/GreenSolution.html

2. CORPORATE SOCIAL RESPONSIBILITY

National Voluntary Guidelines on Social, Environmental & Economic Responsibilities of Business, published by the Indian Ministry of Corporate Affairs,2011

The National Voluntary Guidelines on Social, Environmental & Economic Responsibilities of Business (NVGs) were released by the Ministry of Corporate Affairs in July 2011 with the objective to "mainstream the subject of business responsibilities" and "raise the bar in a manner that makes [businesses'] value-creating operations sustainable" through a domestically developed reporting and disclosure framework (Press Information Bureau, 2011).[15] The NVGs are a further development of the CSR Voluntary Guidelines of 2009 and are applicable to businesses of all sizes and sectors dedicated to MSMEs and include a strong sustainability focus. At their introduction, the responsible Secretary described the NVGs as non-prescriptive, conscious of the realities of Indian business and society, adapting international trends and best practices to the Indian setting. He pointed out the value-added aspect of the guidelines, which increase businesses' "competitive strengths, improve their reputations, their ability to attract and retain talent and manage their relations with investors as well as the society at large" (Press Information Bureau, 2011). Reporting is thus one of the components of the guidelines.

The NVGs were developed by the Indian Institute of Corporate Affairs (IICA) set up in 2008 for this purpose, with the support of the German GIZ. They were developed through a multi-stakeholder consultative approach (TERI-BCSD, n.d.). Covering social, environmental and economic responsibility, the NVGs are structured in nine core principles introducing a Business Responsibility Reporting (BRR) framework for companies to disclose their performance in 48 representative indicators as shown in the table below (Ministry of Corporate Affairs, 2011).

TABLE 12 NVG PRINCIPLES

PRINCIPLE	DESCRIPTION
Principle 1	Businesses should conduct and govern themselves with ethics, transparency and accountability.
Principle 2	Businesses should provide goods and services that are safe and contribute to sustainability throughout their life cycle.
Principle 3	Businesses should promote the well-being of all employees.
Principle 4	Businesses should respect the interests of, and be responsive towards all stakeholders, especially those who are disadvantaged, vulnerable and marginalized.
Principle 5	Businesses should respect and promote human rights.
Principle 6	Business should respect, protect, and make efforts to restore the environment.
Principle 7	Businesses, when engaged in influencing public and regulatory policy, should do so in a responsible manner.
Principle 8	Businesses should support inclusive growth and equitable development.
Principle 9	Businesses should engage with and provide value to their customers and consumers in a responsible manner.

Source: Author's elaboration from Ministry of Corporate Affairs, 2011.

The above were drafted taking into account such things as: inclusive and sustainable development; maximization of shareholder and stakeholder value to lead stakeholders to keep businesses accountable under the guidelines; the business case for business responsibility and; their support by disclosure/reporting framework that is action-oriented and provides standardized parameters to measure, evaluate and benchmark performance (cKinetics, 2013).

Companies that already report according to existing sustainability and CSR frameworks – such as the UN Global Compact, the Global Reporting Initiative, and the Carbon Disclosure Project – are encouraged to continue to do so, in addition mapping their existing reporting to the nine NVGs principles (Sustainability Outlook, 2011). Firms can also phase-in their NVGs reporting, according to their estimates of capacity to do so.

The organizations involved in developing the NVGs argue that the evolving CSR policy process, of which the NVGs are a core part, have contributed to advancing CSR by encouraging it to be a core part of business instead of external projects; by changing the view of CSR as a way to spend profits to a way to make profits and making the business case for it (cKinetics, 2013).

[15] The NVGs can be found under: http://www.mca.gov.in/Ministry/latestnews/National_Voluntary_Guidelines_2011_12jul2011.pdf

Concrete figures on uptake of the NVGs are not yet available, also due to their only recent official adoption in July 2011. Due to their cross-sectorial relevance, the guidelines are also highly relevant for all enterprises in the infrastructure sector. The NVGs undoubtedly help raise awareness of the benefits that companies can reap from sustainability reporting and encourage its uptake. Some don't have a choice—significantly, reporting under the NVGs has been made mandatory for the largest listed companies by the Securities Exchange Board of India (cKinetics, 2013). In effect, in 2013, 73 of the 100 largest companies in India issued corporate responsibility reports, which represents a rise of 53 percentage points relative to 2011 (KPMG, 2013, p. 22). In addition, the NVGs are getting visibility, traction and support from different government agencies (cKinetics, 2013) which will lead to their uptake.

ISO 26000 Social Responsibility, 2010, published by the International Standards Organization

ISO 26000:2010, the Guidance Standard on Social Responsibility, published in 2010 by the International Organization for Standardization (ISO) provides guidance on implementing social responsibility. It is applicable to organizations, independently of their type of activities, size or setting (Social Accountability International, n.d.). Like other standards, it was developed through a multistakeholder process, leading ISO to describe it as an "international consensus" (Social Accountability International, n.d.). ISO 26000 includes the following seven core subjects with corresponding issues under each one. For each core subject and associated issues the standards provide information on scope, its relationship to social responsibility, related principles and considerations, and related actions and expectations as outlined in the table below.

TABLE 13 ISO 26000 CORE SUBJECTS AND CORRESPONDING ISSUES

CORE SUBJECT	ISSUES
Organizational governance	[none]
Human rights	Due diligence; Human rights risk situations; Avoidance of complicity; Resolving grievances; Discrimination and vulnerable groups; Civil and political rights; Economic, social and cultural rights; Fundamental principles and rights at work
Labour practices	Employment and employment relationships; Conditions of work and social protection; Social dialogue; Health and safety at work; Human development and training in the workplace
The environment	Prevention of pollution; Sustainable resource use; Climate change mitigation and adaptation; Protection of the environment, biodiversity and restoration of natural habitats
Fair operating practices	Anti-corruption; Responsible political involvement; Fair competition; Promoting social responsibility in the value chain; Respect for property rights
Consumer issues	Fair marketing, factual and unbiased information and fair contractual practices; Protecting consumers' health and safety; Sustainable consumption; Consumer service, support, and complaint and dispute resolution; Consumer data protection and privacy; Access to essential services; Education and awareness
Community involvement and development	Community involvement; Education and culture; Employment creation and skills development; Technology development and access; Wealth and income creation ; Health; Social investment

Source: Author's elaboration from ISO, 2010.

Due to the fact that ISO 26000 is not a performance standard, uptake in India and across the world is difficult to estimate.

Social Accountability 8000, 2008, published by Social Accountability International

The Social Accountability 8000 standard, also known as SA8000, was created in 1997 by Social Accountability International (SAI) as an auditable social certification standard for acceptable work in all industrial sectors, including infrastructure (Cummings, 2008; Social Accountability Accreditation Services, n.d.; Social Accountability International, n.d.). SA8000 is an internationally standardized code of conduct on working conditions that incorporates the principles of 13 international human rights conventions of the International Labour Organization (ILO) and other UN bodies, as well as national law and corporate and industry codes. SA8000 thereby helps to operationalize these norms, in addition to helping facilitate improved performance through its management systems approach. As many other sustainability standards that have seen significant uptake, it was developed through a multistakeholder process. The standard covers nine elements as listed in Table 14 along with their main requirements:

TABLE 14 SA8000 ELEMENTS AND REQUIREMENTS

ELEMENT	REQUIREMENTS
Child labour	Child labour or its support is not permitted; policies and written procedures need to be in place for when child labour is detected; financial support for the children to attend school needs to be provided.
Forced and compulsory labour	Use or support for forced or compulsory labour is not permitted; no financial or other "deposits" may be required; salary, benefits, property or documents may not be no withheld in order to force personnel to continue work; personnel must be allowed to leave work premises after the work day; personnel must be free to terminate their employment; use or support of human trafficking not permitted.
Health and safety	A safe and healthy workplace must be provided; potential occupational accidents prevented; a system to detect, avoid, and respond to risks has to be in place, as well as records of all accidents and personal protection equipment and medical attention for work-related injuries; risks to new and expectant mothers have to be removed and reduced; toilets, potable water, sanitary food storage, and decent dormitories must be provided; workers have to be able to escape from imminent dangers.
Freedom of association and right to collective bargaining	The right to form and join trade unions and bargain collectively must be respected, including the freedom to organize trade unions and bargain collectively. The company shall not interfere in the workers' activities therein; inform personnel of these rights & freedom from retaliation; where law restricts rights, allow workers to freely elect representatives; ensure no discrimination against personnel engaged in worker organizations; and ensure representatives access to workers at the workplace.
Discrimination	No discrimination may take place based on race, national or social origin, caste, birth, religion, disability, gender, sexual orientation, union membership, political opinions and age. Neither is discrimination allowed in hiring, remuneration, access to training, promotion, termination, and retirement. Threatening, abusive, exploitative, coercive behaviour at workplace or company facilities is prohibited; no pregnancy or virginity tests are allowed.
Disciplinary practices	All personnel must be treated with dignity and respect; corporal punishment and mental or physical abuse of personnel are not tolerated; no harsh or inhumane treatment allowed.
Working hours	Laws & industry standards must be complied with; a normal work week shall not exceed 48 hours plus overtime; usually one day is allowed off after every six consecutive work days; overtime is voluntary and may not exceed 12 hours per week, it may be required only if it is negotiated in the CBA.
Remuneration	The right of personnel to a living wage must be respected; all workers must be paid at least the legal minimum wage; wages must allow meeting basic needs and provide discretionary income; there may not be deductions for disciplinary purposes (with some exceptions); wages and benefits must be clearly communicated to workers and paid in a convenient manner; a premium rate must be paid for overtime; certain practices to circumvent legal obligations to personnel are prohibited.
Management systems	The facilities seeking to gain and maintain certification must go beyond simple compliance, integrating the standard into their management systems and practices.

Source: Author's elaboration from Social Accountability International, n.d.

SAI does not directly certify facilities. Rather, Social Accountability Accreditation Services (SAAS), a now-fully independent entity, originally set up by SAI, manages and directs accreditation activities of Certification Bodies that, in turn, certify industrial facilities.

SA8000 certification in India is among the highest in the world. As of Q2 2013, it ranked second after Italy in terms of certified facilities, at 733 of 3,349 facilities, i.e. 21.9 per cent. In terms of employees employed by certified facilities, India ranked first at 482,191 of 1,915,853, i.e. 25 per cent at the same point in time.[16] Regarding the relevance of these figures for infrastructure, disaggregated figures are not provided by sector for each country. However, on the global level, construction is one of the primary industrial certified sectors and includes infrastructure. Other major relevant sectors are energy, transportation, engineering/development, IT, logistics, waste management and building materials.

AccountAbility 1000 series, revised in 2008, published by AccountAbility

AccountAbility (AA) has developed a series of principles-based standards to assist organisations in becoming more accountable, responsible and sustainable, covering businesses' issues related to governance, business models, organizational strategy, as well as providing operations guidance on sustainability assurance and engagement of stakeholders (AccountAbility, 2012d). The series is geared towards supporting low-carbon development and green growth through integrated reporting and assurance and can be used by many types of organisations. An overview of each of the three AA standards is provided in the table below.

[16] See: http://www.saasaccreditation.org/certfacilitieslist.htm

TABLE 15 OVERIEW OF ACCOUNTABILITY AA1000 SERIES STANDARDS

STANDARD	DESCRIPTION
AA1000APS AccountAbility Principles Standard	A framework to identify, prioritise and respond to sustainability challenges based on the principles of: inclusivity, the participation of stakeholders in the strategic response to sustainability; materiality, issues that will influence decisions, actions and performance; and responsiveness, the response to stakeholder issues that affect sustainability performance requiring public disclosure
AA1000AS Assurance Standard	A methodology to evaluate adherence to the AA1000APS Principles, in particular responsiveness through public disclosure. It is supported by: mandatory licensing for Assurance Providers; certification of assurance providers; training programs in corporate responsibility and guidance publications
AA1000SES Stakeholder Engagement Standard	is a framework to ensure stakeholder engagement processes are purpose driven, robust and deliver results, supporting the inclusivity principle of the AA1000APS

Sources: Author's elaboration from AccountAbility, 2012a, 2012b, 2012c.

3. BUILDING CODES

Energy Conservation Building Code, revised in 2008, published by the Bureau of Energy Efficiency, India.

The Energy Conservation Building Code (ECBC) was established in 2007 by the Bureau of Energy Efficiency (BEE). A revised code was published in 2008. The BEE itself was created in 2002 under the Ministry of Power through the Energy Conservation Act of 2001, which promotes energy efficiency and conservation domestically and also called for the creation of the ECBC. The code represents the first national building energy code for India. A voluntary standard, the ECBC establishes minimum energy efficiency requirements for building envelopes, lighting, HVAC, electrical systems, water heating and pumping systems. The essential features of the ECBC are outlined in Table 16 below.

The ECBC is one of three national government building codes applied in India and the only one that addresses energy. The other two are the National Building Code of the Bureau of Indian Standards, which covers a range of structural, safety and other design issues and is a comprehensive national instrument for regulating construction activities; and the Environmental Clearance (including the EIA of the MoEF) which must be obtained before construction, as described above in this report.

TABLE 16 ESSENTIAL FEATURES OF ECBC (MAY 2008 VERSION)

SECTION NUMBER AND TITLE	DESCRIPTION
1 & 2. Purpose and Scope	Minimum requirements for energy-efficient design and construction of buildings and building complexes with a connected load of 500 kW or greater, or a contract demand of 600 kVA or greater and a conditioned area of >1,000 m^2
3. Administration and Enforcement	Mandatory compliance for all applicable new buildings, additions and major renovations to existing buildings
4. Envelope	Mandatory provisions and either the prescriptive criteria or trade-off options
5. HVAC	Mandatory provisions and prescriptive criteria
6. Service Hot Water and Pumping	Mandatory provisions, including solar water heating for at least 1/5 of design capacity, unless systems use heat recovery
7. Lighting	Mandatory provisions and prescriptive criteria for interior and exterior lighting features
8. Electrical Power	Mandatory requirements for transformers, motors, and power distribution systems
9. Appendix A – Definitions, Abbreviations and Acronyms	Definitions of terms, abbreviations and acronyms in the context of this code
10. Appendix B – Whole Building Performance Method	An alternative to the prescriptive requirements of the code
11. Appendix C – Default Values for Typical Constructions	Procedure for determining window efficiency (also known as fenestration product U-factor), and the Solar Heat Gain Coefficient (SHGC), as well as typical thermal properties of common building and insulating materials (from ASHRAE Fundamentals Handbook, 2001)
12. Appendix D – Building Envelope Tradeoff Method	Procedure for calculating envelope performance factor (EPF) and tables for EPF coefficients for the five climate zones and the two building occupancy schedules
13. Appendix E – Climate Zone Map of India	From the National Building Code 2005, Part 8, Figure 2
14. Appendix F – Air-Side Economizer Acceptance Procedures	Construction inspection and procedure for equipment testing
15. Appendix G – Compliance Forms	Envelope summary, building permit plans checklist, mechanical summary, mechanical checklist, lighting summary and lighting permit checklist

Source: ECBC 2007 May 2008 version, and correspondence with ECO III, as cited in Evans, Shui, & Somasundaram, 2009.

Although voluntary at the national level, mandatory adoption is foreseen for the future by the central government and/or individual state government. In effect, eight Indian sub-national entities have mandated enforcement of the ECBD for new commercial buildings as of FY2011-12 ("ECBC for commercial buildings," 2011): Delhi, Maharashtra, Uttar Pradesh, Haryana, Karnataka, Tamil Nadu, Andhra Pradesh and West Bengal. Further, as of mid-2013 Rajastan, Orissa, and Gujarat were working on drafting ECBC regulations (Williams & Levine, 2013). For these, the enforcement mechanisms can be assumed to be as for other mandatory building codes (Evans et al., 2009). These consist of municipal authorities reviewing all building designs for compliance and their inspectors visiting building sites during construction phase to ensure that practice matches previously approved design. In reality, effective implementation is hindered by the following (Hong et al., 2007; Huang & Deringer, 2007 as cited in Evans et al., 2009; Williams & Levine, 2013):

- Lack of implementation at the local level, which is responsible for all building codes (except for national government-owned buildings) through the integration of the ECBC into the bylaws.
- Lack of capacity of municipal personnel in enforcement and monitoring, and local administrative infrastructure for energy code enforcement, including field inspectors for code checking and inspections.
- Lack of technical expertise of building professionals in construction materials certification capacity to assist in compliance.
- Sub-optimal system of incentives, including the requirement of going through multiple permitting processes, long delays in permit reviews, low penalties for noncompliance, among others.
- A short supply of suitable building materials, in part due to the current lack of demand for them.
- The ECBC currently not being mandatory across India.

The BEE supports ECBC implementation through policies and technical support, also closely with national and state governments. The USAID-financed ECO III project also provides technical assistance in support of implementation. According to estimates, making compliance with ECBC mandatory across India would lead to savings of 1.7 billion kilowatt hours per year, equivalent to 0.2 per cent of the country's electricity consumption (Rawal, 2012). In this case, compliance is estimated at 10 per cent in 2013, 35 per cent in 2015 and 65 per cent by 2017 (Rawal, 2012).

4. INFRASTRUCTURE ASSESSMENT & CERTIFICATION

Indian Green Building Council Ratings Systems, promoted by the Indian Green Building Council.

The Indian Green Building Council (IGBC) promotes sustainable construction through a range of activities, including the development and dissemination of the Leadership in Energy and Environmental Design (LEED)-India rating system in two variations: LEED India for New Construction, and LEED India for Core and Shell. These are adaptations of the U.S. Green Building Council's LEED and include performance in five areas: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality. Any LEED-India certification means that the building also meets the specifications of the above-mentioned ECBC, the NBC 2005, the MoEF guidelines and the Central Pollution Control Board norms (CII & IGBC, 2008). Similarly to other Green Building Councils, the IGBC has a membership of construction companies, architects, product manufacturers and research institutions. IGCB now counts 1,664 members and 1,147 IGBC accredited professionals.

While LEED might be the most well-known, IGBC also offers a series of rating systems for buildings and other urban structures addressing water, energy efficiency, natural resources, waste, and occupant health: Existing Buildings (O&M), Green Homes, Green Townships, Green SEZs, Green Factory Buildings, and Green Landscapes.

Green buildings occupy a small but growing share of the Indian real estate market. As of December 2013, IGBC had rated 427 green buildings including infrastructure projects such as airports and hospitals (IGBC, 2013). A further 2,285 buildings were registered for being rated in the future, making up a total of 1.72 billion square feet of "green building footprint." IDFC reports that the major building developers are shifting their portfolios towards green buildings (IDFC Policy Group, 2011). Some of the largest national and regional developers have committed themselves to integrating sustainability into the large majority of their projects.

Envision Sustainable Infrastructure Rating System, 2011, developed by the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure, United States

The Envision Sustainable Infrastructure Rating System was developed by Harvard University and the Institute for Sustainable Infrastructure in 2011 as a project assessment and guidance tool for sustainable infrastructure design (ISI & Zofnass Program, 2012). It provides an objective framework of criteria and performance achievements that helps users identify ways in which sustainability can be introduced into planning, design, construction, and operation of infrastructure projects. It is applicable to any infrastructure sector except buildings, as it is meant be complementary with green building rating systems such as LEED. Through 60 criteria it addresses the categories listed in Table 17 below.

TABLE 17 ENVISION SUSTAINABLE INFRASTRUCTURE RATING SYSTEM CATEGORIES

CATEGORY	CATEGORY'S COMPONENTS
Quality of life	Purpose, Community, Well-being
Leadership	Collaboration, Management, Planning
Resource allocation	Materials, Energy, Water
Natural world	Siting, Land & Water, Biodiversity
Climate and risk	Emission, Resilience

Source: Author's elaboration from ISI & Zofnass Program, 2012.

The tool has been designed for use in the United State and has already seen significant interest there. Large engineering design companies and municipalities, including Los Angeles, New York and the U.S. Army Corps of Engineers, have become members and many require in their RfPs that vendors be Envision qualified (Water21, 2013, p. 21). Altogether, the agencies that have joined serve one third of the U.S. population. Similar comprehensive and rigorous rating systems of infrastructure are needed for India. Envision could be one such tool to draw from and adapt to the local context.

Infrastructure Sustainability Rating Tool

The Infrastructure Sustainability Rating Tool, developed by the Infrastructure Sustainability Council of Australia (ISCA), is a powerful tool to comprehensively assess sustainability performance across design, construction and operation of infrastructure projects.[17] It consists of a technical manual, rating scorecard and a materials calculator that can be used by virtually all industry stakeholders, from developers, designers, and planners, to builders, operators and owners, through to legislators and others. The rating process involves four steps: registration, assessment, verification, and certification and ratings can be of three types: design, "as built" and operation. The tool can be applied in practically all infrastructure sectors from transport, water, and communications to energy. It covers the following themes: Management & Governance; Using Resources; Emission, Pollution & Waste; Ecology; People & Places; and Innovation. ISCA is planning on including the themes of Economic Performance and Workforce in the future. This tool applies to the Australian context, where ISCA is both developer of the tool and the certifier. It would be possible to envision the application of this tool to the Indian context.

Greenroads Rating System, 2010, developed by the University of Washington, U.S. and the Greenroads Foundation.

The University of Washington in the United States and the Greenroads Foundation developed the first sustainability rating system focused on roadway design and construction in 2010 (Greenroads Foundation, 2013a). The tool evaluates a road's overall environmental and social impact offering various levels of certification, taking into account aspects from construction materials and practices to noise pollution, habitat control, and bike lanes. Certification is based on incremental levels of performance as outlined in Table 18 below.

TABLE 18 GREENROADS RATING SYSTEM MANDATORY AND VOLUNTARY CATEGORIES

CATEGORY		DESCRIPTION
Required		
	Environmental Review Process	Complete and environmental review process
	Life-Cycle Cost Analysis (LCCA)	Perform LCCA for pavement section
	Life-Cycle Inventory (LCI)	Perform LCI of pavement section with computer tool
	Quality Control Plan	Have a formal contractor quality control plan
	Noise Mitigation Plan	Have a construction noise-mitigation plan
	Waste Management Plan	Have a formal plan to divert C&D waste from landfill
	Pollution Prevention Plan	Have a TESC/SWPPP
	Low-Impact Development (LID)	Feasibility study for LID stormwater management
	Pavement Mgmt. System	Have a pavement management system
	Site Maintenance Plan	Have a site maintenance plan
	Educational Outreach	Publicize sustainability information for project
Voluntary		
	Environment & Water	Storm water, habitat, vegetation
	Access & Equity	Modal access, culture, aesthetics, safety
	Construction Activities	Construction equipment, processes, quality
	Materials & Resources	Material extraction, processing, transport
	Pavement Technology	Pavement design, material use, function

Source: Author's elaboration from Greenroads Foundation, 2013a.

[17] See: http://www.isca.org.au/

The current value of registered projects is over US$5 billion (Greenroads Foundation, 2013c). Uptake has been substantial in the United States, where the tool was developed. Projects have also been registered in New Zealand, Canada, and South Africa, demonstrating applicability beyond the U.S. context (Greenroads Foundation, 2013b).

5. STANDARDS FOR EMISSION OFFSETTING AND TRADING

The Clean Development Mechanism for Greenhouse Gas Emissions Offsetting and Trading, under the UN Framework Convention on Climate Change

GHG emission offsets are increasingly being used to compensate for emissions both in compliance—such as the UNFCCC Clean Development Mechanism (CDM), and the EU Emissions Trading System—and voluntary markets. As GHG emissions are global in nature, it can be more cost-effective to purchase credits of emission reductions elsewhere in the globe instead of reducing local emissions. Several standards have been developed as part of programs that quantify emissions reductions of projects and generate credits that are traded in the compliance and voluntary markets.

Under the UNFCCC, various CDM methodologies are employed to determine the amount of Certified Emission Reductions (CERs) generated by a specific mitigation project (UNFCCC, 2012). Depending on the size and type of project—for instance, renewable energy, energy efficiency, or reforestation—numerous different official methodologies are available that can be considered standards relevant to infrastructure, particularly in the energy domain.

In terms of issuing CERs, as of December 2013, India ranked second (after China) with 13.4 per cent of the total, making up 188.6 million CERs (UNEP Risoe, 2013). These were generated through a total of 2,097 projects. The number of different projects, by project type is shown in Figure 19 below.

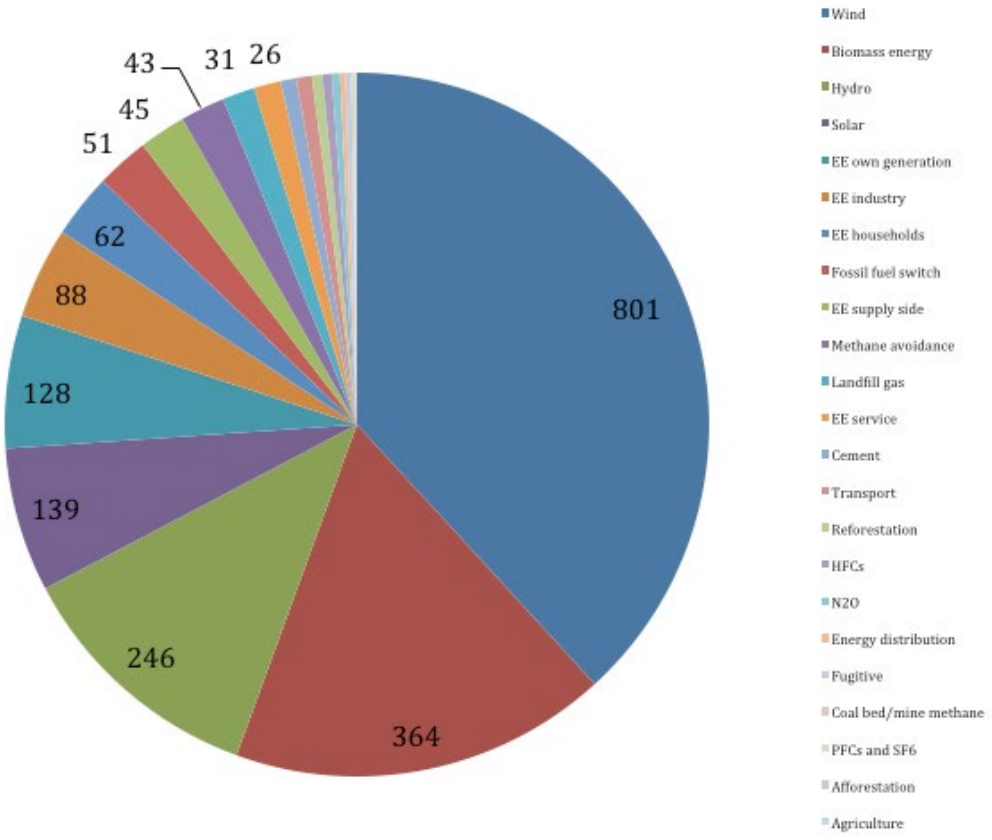


FIGURE 20 NUMBER OF INDIAN CDM PROJECTS BY TYPE AS OF DECEMBER 1, 2013

Source: Author calculations using data from UNEP Risoe, 2013.

6. TIMBER

Forest Stewardship Council, Certification on Forest Management, Chain of Custody and Controlled Wood, revised in 2011.

Since 1993 the Forest Stewardship Council (FSC) has set out principles and criteria for best practices in forest management (FSC, n.d.). These are translated to specific regional and national standards by FSC working groups. In addition, chain of custody (CoC) certification verifies FSC-certified products along their production chains. This global not-for-profit organization works on a multistakeholder platform including governments, business and civil society. As of December 6, 2013, 188.176 million hectares had been certified, and 27,228 CoC (and 1,245 forest management/CoC) certificates had been issued worldwide (FSC, 2013b). Standards include not only environmental impacts and management plans, but also community relations and worker's and indigenous peoples' rights.

The FSC label can also be relevant for infrastructure for the timber used in its construction. FSC describes such certified building material as renewable, non-toxic, biodegradable and carbon sequestering (FSC, 2013a). Uptake of FSC building materials is encouraged by green building standards, such as LEED India, above. LEED and other rating systems also award credits towards their ratings for the building materials used. Figures on diffusion of FSC-certified building materials in India are not available; however, the rapidly rising green building certifications in India create a significant market.

7. RECOMMENDATIONS

Standards can play a significant role in advancing sustainable infrastructure as they provide both the baseline and advanced intelligence on environmental and social product characteristics and performance requirements.

- **Policy-makers can use the requirements of performance and management standards as a benchmark when designing technical specifications and RfPs:** Because environmental and social standards encompass product characteristics and performance requirements, they provide a de facto benchmark for policy makers to: a) determine what constitutes an environmentally and socially preferable product or service; b) the material content and manufacturing processes that need to be followed to produce environmentally and socially preferable products/services. These processes are important if RfPs are to include aspects on low toxicity, material, water and energy efficiency, end-of-life-treatment, use of recycled materials etc.
- **Standards can help policy-makers determine at which level to set the bar in terms of environmental and social performance.** Setting requirements in technical specifications and RfPs can be challenging. If RfPs are to serve as an incentive to improve environmental and social competition across Indian industry, technical specifications, award criteria and prequalification requirements need to demand levels of performance that are higher than mainstream practice, but not as high so as to crowd out domestic suppliers. Moreover, the demand levels of performance have to be aligned with best available technologies but not involve excessive increases in purchasing costs. The solution here is to strike a balance between mandatory and optional requirements in RfPs—making advanced technology-related performance an optional requirement on which additional award scores are awarded and prevailing best practice mandatory.
- **Sustainable infrastructure assessment tools can be used to alter the procurement mindset to determine value-for-money, not only based on purchasing costs, but across the asset life cycle.** Infrastructure rating tools such as those discussed above are valuable, as they promote a holistic approach to developing sustainable infrastructure. In following the recommended methodologies and achieving the given levels of performance, both the public purse and private investors are assured of an asset that is low maintenance and resource-efficient during its operation. Efficiencies during construction can also be obtained and, moreover, techniques in greener and so-called "vernacular" architecture (based around local needs and construction materials), the use of greener building materials and employment of domestic skills and labour are prioritized. Collectively, these gains will help change the procurement mindset—to value and thus prioritize environmental and social performance in design of infrastructure tenders and indeed across the PPP process.

Sustainability standards provide an impetus for implementing the recommendations of environmental and social impact assessments. Standards compliment and encourage compliance with regulatory standards, and sustainability standards are no exception. They can be used to increase both the technical content and implementation of the mandatory environmental and social safeguards, including the recommendations of environmental and social impact assessments. Both standards and the mandatory safeguards are designed to help organizations improve their environmental and social profile. Working towards certification or accreditation right from the start of design and development can therefore help developers and regulators achieve their desired objectives in an effective manner.

SECTION VIII

Recommendations

SECTION VIII – RECOMMENDATIONS

The recommendations of this study focus on increasing value for money (VfM) in the commissioning and procurement of infrastructure in India. In promoting sustainable development, we also present the case for value for money to be interpreted beyond the traditional financial performance parameters to include wider environmental, social and economic externalities across the project life cycle.

The recommendations therefore are organized in two parts:

- Part 1 focuses on measures increase the effective implementation of India's environmental and social safeguards.
- Part 2 focuses on policies and practices that go beyond compliance with environmental, social and economic safeguards and embed environmental and social performance across the life cycle of the project.

BOX 11 OVERVIEW OF RECOMMENDATIONS

1. **Improving the effectiveness of existing safeguards**
    - Incorporate environmental and social requirements into the request for proposals (RFPs).
    - Build environmental and social performance requirements into PPP pre-qualification.
    - Bundle the environment, forest and wildlife clearances.
    - Obtain clearances and approvals before the launch of the tendering process to optimize risk sharing and reduce delays.
    - Leverage EIA findings throughout project cycle and upgrade EIA.
    - Catalyze civil society's positive role in increasing transparency and accountability, providing independent expertise and representing the public interest.
    - Incentivize rigour in the post-concession monitoring of the safeguards.
    - Enhance access to scientifically accurate data.
    - Increase capacity to monitor compliance.
2. **Moving beyond existing safeguards**
    - Explore new ways to financing sustainable infrastructure, via:
        - Viability gap funds
        - Infrastructure debt funds
        - Bond markets
        - The Takeout Finance Scheme
        - Sovereign wealth funds
        - International green funds
    - Use existing infrastructure sustainability rating tools to assess, improve and communicate sustainability performance.
    - Move towards a "strategic" VfM mindset.

1. IMPROVING THE EFFECTIVENESS OF EXISTING SAFEGUARDS

Legally required social and environmental safeguards (i.e., approvals and clearances) in India are in line with global best practice. There are challenges in the implementation of these safeguards, especially in the pre-procurement stages of PPP projects. The recommendations that follow are thus aimed at improving the implementation of safeguards and moreover, reducing environmental and social risks for both public and private investors during the post-concession administration, construction and operations phases of the project.

Incorporate Environmental and Social Requirements Into RFPs

At present, environmental and social criteria play only a minimal—if any—role in bid evaluation. For actors involved in PPPs to begin to appreciate environmental and social clearances and approvals as more than formalities, as is often the case, it is recommended that the use of environmental and social criteria be enhanced. Specifically, technical specifications in RFPs—and thereby subsequent bid evaluations—could cover parameters such as green building standards, bioclimatic features, use of recycled materials, use of green building materials, energy efficiency, emissions, among many others, as applicable. The inclusion of such environmental and social criteria could contribute to a mindset shift regarding how environmental and social aspects are viewed in relation to PPP project design and evaluation.

This could also lead to major cost and energy savings throughout the user life of the asset. In Section 4 of this report, the case of the six-laning of the 555-kilometre Kishangarh-Udaipur-Ahmedabad Highway was presented. This particular project had energy requirements equivalent to **1.2 million tonnes of CO_2**—equal to the **annual emissions of 700,000 Indians**. If the RFP had, in this case, incorporated criteria on the use of recycled materials, reduced imported aggregate, or the replacement of traditional hot-mix bituminous asphalting with a new cold-mix process, significant energy and cost savings could have been obtained. This last technique alone can potentially **reduce CO_2 emissions by 55 per cent**.

Similarly, the loss of valuable ecosystem services might be avoided or reduced if environmental and social criteria were integrated into the RFP. As was demonstrated in Section 4, the global average value of a wetland system is **US$14,785/hectare/year**. The construction of a thermal power plant in Andhra Pradesh would have led to the destruction of 306 hectares of pristine coastal wetlands – which provides ecosystem services worth approximately **US$4.5 million/year**. This illustrates the significant value of services provided by the land to the local and global population, value that was not identified in the beginning of the PPP decision-making and appraisal process. Factoring such considerations into the RFP could lead to a broader consideration of alternative sites, technologies, and to optimizing VfM across the lifecycle.

Upgraded environmental and social criteria in RFPs would create an incentive for seriously taking into account—and investing in—findings from environmental and other clearances and approvals into asset design and construction. As a direct or indirect consequence of the above, O&M costs would be reduced (as would the risk associated with the O&M phase of the PPP project). VfM would be increased through reduced operation expenditure risk. With similar benefits, environmental and social criteria can also come into the bidding process before the RFP is launched, as discussed in the next recommendation.

Build environmental and social performance requirements into PPP pre-qualification

To provide a tangible incentive for building expertise on sustainable infrastructure, the GoI can consider including environmental and social performance criteria into PPP pre-qualification. As such, this can be made a formal prerequisite in the request for qualifications (RfQ). Such a move will support the levelling of the playing field on sustainability performance and increase the expertise of bidders on environmental technologies, green architecture, greener engineering, environmental management systems and more. To ensure that no suppliers are crowded out, environmental and social performance criteria could be introduced in an incremental manner, beginning with the adoption of standards such as ISO 14001 Environmental Management and SA 8000 for acceptable workplaces.

Bundle environment, forest and wildlife clearances to enhance VfM

The four social and environmental safeguards assessed in this report are in place to protect both people and the environment from the potentially adverse impacts of infrastructure development. There is reason to believe, however, that they are not optimally fulfilling this role and are therefore not delivering VfM. Our research interviews revealed that these safeguards seldom manifest in

any physical monitoring and evaluation of the asset under construction (in part because the monitoring capacity is insufficient) but instead represent burdensome, lengthy and sometimes redundant administrative processes to project proponents.

The risk in this case is that the safeguards become less about securing a healthy environment and citizenry and more about securing a healthy "paper trail" to demonstrate completion. More research will be required to verify this claim, but certainly some of the research compiled for this report attests to the absence of monitoring of the efficacy of the safeguards. Additionally there has been a substantial amount of anecdotal evidence compiled on the difficult administrative "tick boxes" they require. The trick will be streamlining the processes while continually strengthening (and certainly not diluting) content.

One option to enhance the role of safeguards is a more thorough and "bundled" environmental clearance, i.e., one that undertakes a comprehensive and substantive enquiry into the environmental impacts of a project as well as its possible adverse impacts on forests and wildlife. Such a package would not only streamline the process, thus addressing the legitimate concerns for a more reliable investment climate, but would also deliver a more holistic picture of the combined and cumulative aspects of a particular project and thus represent a more robust safeguard. From the perspective of the public sector, in this case the MoEF, this could mean a quicker, more cost effective regulatory process, and an occasion to consolidate content, provide for additional efficiency and to enhance VfM.

Obtain clearances and approvals before the launch of the tendering process to optimize risk sharing and reduce delays

Throughout the research process the authors have been confronted with views regarding clearances and approvals that can be grouped broadly into two opposing camps: those that consider them to represent unnecessary delays at huge costs, and those that consider potential delays as necessary to ensure sufficient due diligence and effectiveness. Government recognition of existing delays and their investment-hindering impact has led to a number of efforts to streamline processes including: the National Green Tribunal (NGT) to speedily resolve environmental cases; the Cabinet Committee on Investment with powers to overrule ministerial clearance and approval decisions; and the proposed PPP Tribunal which will be headed by a retired Supreme Court Judge and mandated to resolve PPP disputes within six months (a draft bill exists at the time of writing). However, in the interest of VfM, even more efforts are needed. Acquisition of public land, for instance, takes around 295 days in India, more than two times the world average (Williams & Kumar, 2013).

Therefore it is suggested that the timing of the clearances and approvals be improved so that they are obtained by the sponsoring authority before the launch of the tendering process. Delays would thus not affect the private sector parties coming in at the tendering stage. On the contrary, having the clearances and approvals obtained before considerably reduces legal and institutional risks for the private sector and will contribute to an improved investment climate for infrastructure. In addition, pre-tendering passing of clearances and approvals will reduce the deal structuring costs for the private sector. Project development costs easily amount to 3 per cent to 5 per cent of the total project budget and up to 10 per cent for projects with more uncertain variables.

In obtaining the safeguards before the RFP is launched, the significant costs of delays—**amounting to more than US$20 billion across the last two Plan periods**—could potentially be avoided. As highlighted in Section 4, as much as **42 per cent of infrastructure projects in India experience time and cost overruns**. This can result in average cost escalations of 16.9 per cent, or INR 1,207 billion (~US$ 200 million); hence overreaching both time and cost targets and contributing to an uncertain investment climate.

Furthermore, shifting approvals and clearances to the pre-tendering stage (before the RFQs) would also allow taking the time necessary for rigorous analyses without being detrimental to investment. On the one hand, the launch of EOIs or RFQs might be delayed; on the other, the time until beginning of construction would, in many cases, be reduced. In addition, sustainability could be strengthened if clearances and approvals are obtained before the bid, as the findings from them could inform the technical specifications. The benefits of such early action can greatly contribute to VfM because:

- It is likely that the private sector bids will be more competitive because their internal need to price in the risks of delays will be greatly reduced. The infrastructure will get built at reduced cost to government.
- Both the private and public sectors will benefit from reduced delays and project cancellations.
- Negative social impacts can be assessed and mitigated well in advance, for example avoiding loss of livelihoods, or avoiding risks to human health—which, apart from avoiding compensation costs, avoids losses to the wider economy.
- Environmental impacts can be assessed and mitigated in advance—which is always far cheaper than after the event.

With such a pressing need for infrastructure, some project sponsoring authorities in India might be reluctant to prolong the launch of the RFQ and the RFP for a given infrastructure project. Arguably, however, the "front loading" of the clearances would not lead to any further delays—on the contrary, it could lead to more expedient processing (see also the recommendation on "bundling"), and subsequently an earlier operational start date. This should also be desirable from the perspective of the public project sponsors, as earlier operation means faster provision of needed infrastructure services to the public which is at the core of their mandates (and not the pre-RFP time requirements).

It is the role of the government in PPP arrangements to assume the legal and political risks, including uncertainties from the environmental and social clearances and approvals. This makes the case for the government of India to holistically assume these risks in an efficient and transparent manner by obtaining clearances and approvals before the launch of the RFQ and RFP. The effect of this would be a positive signal to the PPP market of increased predictability and transparency—while holding the potential to effectively improve projects' sustainability.

This recommendation is in line with GoI guidelines, including the *Draft National Public Private Partnership Policy*, under which the public sector should obtain land and clearances, thereby taking over the associated risks from the private sector (Dept. of Economic Affairs, 2011). This approach is already being followed for ultra mega power project PPPs which can serve as a model in some regards (Dept. of Economic Affairs, 2009).

Under the current VfM model used by the GoI, the parameters covered are: project finance feasibility, operation phase risks (revenues and volumes), construction phase risks (overruns in cost and time) and contract renegotiation risks. Therefore, assuming the risk of environmental and social approvals and clearances before the launch of the RFQ and RFP would effectively enhance VfM, even using the GoI's preferred tool.

Leverage EIA findings throughout project cycle and upgrade EIA

The use of the environmental impact assessment (EIA) as an anticipatory environmental management tool has generated debate for decades on the extent to which it is achieving its purposes. It is interesting to note that all around the world EIA processes are currently being revised and reformulated—often being perceived as lengthy and demanding exercises, and without accruing immediate tangible benefits for either contract party. India is no exception to the fact that the mechanisms for ensuring EIA efficacy remain either weak or absent from most regulatory systems.

In the European Union, for instance, there is currently a review process underway of the Environmental Impact Assessment Directive. Criticized for leading to lengthy delays and legal disputes—and also to market distortions when not implemented evenly across the EU—a proposal for a new Directive was put forward in October 2012. Some of the main issues the new Directive will address are: the screening process, the quality of the EIAs being conducted, and the harmonization with other existing directives and national laws.

Procedural implementation challenges seem to dominate the EIA discourse, but are they actually ensuring VfM? Ideally, the EIA findings should be integrated into the decision-making stages of development planning, contributing to the urban planning processes and the design of sustainable assets. This is directly linked to the first recommendation in this section. Another way to do this may be to establish even stronger links between the EIA for a given project and its ongoing environmental management. For example, the conditions of the environmental clearance could be transcribed directly into the Concession Agreement itself, thus bringing greater emphasis to the clauses related to compliance with the implementation of the safeguards. Another approach could be the use of the strategic environmental impact assessment (SEIA) to upgrade the clearances to reflect global best practice.

Catalyze civil society's positive role in increasing transparency and accountability, providing independent expertise and representing the public interest

Civil society organizations (CSOs) hold considerable potential to contribute to public value maximization, also concerning PPP projects and frameworks. This is specifically relevant in India, where advocacy groups have a long and influential history. A number of CSOs are active on the national, state and/or local levels. It is recommended that PPP frameworks foresee a more systematic inclusion of CSOs in helping raise the effectiveness of safeguards. Three specific areas are highlighted as pertinent for action:

- **Increasing transparency and accountability:** One of the central justifications for CSOs' existence is their role as watchdogs over the public and private sectors. Legal and financial means should be provided to qualified CSOs to exercise this role more efficiently. To a limited extent this is already happening: Green Clearance Watch[18] and other websites scrutinize projects, and organizations are actively contributing to public hearings, thereby fulfilling their purpose and not beholden to special interests. Means could be provided to ensure that all public hearings are streamed live and archived to avoid them becoming mere public relations exercises, as suggested by the Director of CSE (IDFC, 2013). In the course of this project, the research team has been confronted with severe difficulties in accessing documents, such as Concession Agreements, that are legally required to reside in the public domain. This is symptomatic of the lack of transparency around many projects, and CSOs should be catalyzed to remedy this. The Right to Information Act that provides a procedure to request and access public documents is a step in the right direction but more action is needed for transparency in PPPs.
- **Independent expertise:** Some CSOs hold valuable knowledge and skills for improving sustainability of PPP projects. Various bodies have the capacity to produce independent environmental and social assessments of PPP projects. Authorities should provide more consulting contracts for partial or entire project studies to CSOs, particularly on social and environmental aspects. This was, for instance, the case in the CSE report commissioned by the MoEF on the Adani Power PPP published in 2013. Another area where CSO expertise can assist government is the training of personnel, such as CST training pollution control board officials (of the MoEF). Such programs should be stepped up.
- **Representing public interest:** While formally the public is recognized as a stakeholder in some processes, such as through the Environmental Appraisal Committee (EAC) and via public hearings, there are plenty of other venues where there it is not adequately represented. It is recommended that CSOs be given more formal opportunities to represent the public interest or facilitate its representation. The PPPAC, as the body that decides on which projects enter the PPP pipeline, exclusively includes Secretaries of miniseries/public bodies. A seat for CSOs, even without voting power, would be adequate to raise potential issues with PPPs early on. Another recommendation to improve public interest representation is a more formal role for CSOs in ensuring effective public hearings, for instance by vetting outcomes as legitimate.

Incentivize rigour in the post-concession monitoring of the safeguards

A recurring theme in the findings of this report was the lack of monitoring of compliance with the conditions of the environmental and social safeguards. While there are many conditions set through the clearances (e.g., environmental management plans, compensatory afforestation, catchment area treatment plans etc.) there are few mechanisms to monitor whether or not the clearance conditions are actually being met.

Proper monitoring and reporting of the environment clearance conditions at Adani Port, in Gujarat, for example would have adequately noted and responded to the widespread deterioration of mangroves – which represents a loss in the range of **US$200,000 to US$900,000/hectare** in annual ecosystem services (see Section 4 for details). Instead, an independent fact-finding mission uncovered the scale of loss the ecology, biodiversity and economy of the region due to the construction of the port and thermal power plants.

[18] The website, published by the Centre for Science and Environment (CSE), describes itself as "a public information system to track environmental and forest clearance". It is accessible at: http://www.greenclearancewatch.org

Monitoring compliance is a huge and complex issue, closely related to monitoring capacity, and indeed not a challenge unique to India. PPP Concession Agreements, however, contain clear obligations for both the private and the public sector entities related to the upholding of the safeguards. Some examples are:

- The public sector (i.e., state governments) is responsible to ensure fair compensation is provided to families and residents displaced due to infrastructure development, as they are the entity responsible for acquiring the land and for distributing resettlement, rehabilitation and compensation packages.
- The public sector (i.e., MoEF) is responsible for the monitoring and enforcement of the compensatory afforestation (CA) activities, as states (specifically the state Compensatory Afforestation Fund Planning and Management Authorities [CAMPAs]) are the guardians of the funds set aside for afforestation and rehabilitation activities.
- The private sector (i.e., the concessionaire) is responsible for the implementation of the environmental management plan and undertaking any mitigation measures as recommended in the environmental clearance.

Both parties have contractual duties to uphold environmental and social clearances post-concession. In the absence of comprehensive monitoring, however, what incentives are there for the private entities to implement their contractual obligations to the safeguards (e.g., an environmental management plan [EMP])? As demonstrated in Section 5, there is certainly a financial incentive to mitigate environmental risk and therefore lower the cost of capital. More research is needed in this space. There may also be a reputational incentive to uphold the safeguards in order to avoid public shaming and exposure. Finally, as the monitoring capacity of the regulatory agencies is enhanced (as also recommended below), there must be compliance-related incentives (or disincentives) such as meaningful fines, audits, periodic review, and benchmarking on the uptake of best-in-class monitoring methods and technologies.

Enhance access to scientifically accurate data

With respect to the four safeguards discussed in this report, namely the environmental clearance, the forest clearance, the land acquisition process and the wildlife clearance, their efficacy rests entirely on the baseline data with which they are reviewed and ultimately granted. In order to deliver VfM, all stakeholders require accessible and scientifically accurate data, including:

- The MoEF and its various branches and committees → in order to judge project proposals against the state of the natural environment, forests, wildlife and the presence and scale of human settlements and to monitor cumulative impact.
- The user agencies or project proponents → in order to conduct rigorous feasibility analysis and to comprehensively complete the applications in the prescribed formats.
- The infrastructure investors → in order to minimize risk, identify land for greenfield/brownfield sites, to appreciate the risks associated with poor environmental/social performance and to speed up the issuance of clearances.
- The third-party consultancies conducting EIA reports → in order to generate thorough and reliable assessments of impacts and propose effective mitigation measures.
- The public → in order to hold authorities accountable and ensure VfM.

It is noteworthy that the MoEF has already taken initiative on using remote-sensing technologies to demarcate ecologically sensitive areas. At the time of writing, for instance, the Ministry issued a call for proposals on *Remote Sensing and GIS for accurate inventory of natural resources and environmental planning*. There have also been instances of collaboration with other Indian institutions—to distinguish vegetation types across a large landscape for example, as was done in the Western Ghats with the National Remote Sensing Centre (NRSC) and the Indian Space Research Organization (ISRO). This type of collaboration should be fostered and even solidified moving forward. In addition to more formalized collaboration with other Indian organizations, the MoEF could also seek partnerships with international organizations that compile global datasets, tools and reports such as the United Nations Environment programme's (UNEP's) World Conservation Monitoring Centre.[19]

[19] See: http://www.unep-wcmc.org.

Better and more widespread access to data will also improve the ability of third-party consultancies to undertake thorough EIAs, and for the public to hold them accountable. As was demonstrated in Section 4, the EIA for the construction of a thermal power plant in Andhra Pradesh failed to identify the area under consideration as valuable wetland, instead referring to it as a "wasteland." This coastal wetland provides **ecosystem services worth as much as US$4.5 million/year**. The more that verified baseline data is available in the public domain, the more likely it is that an EIA study is open to public scrutiny. In this case there was no recourse until the case made it to the Supreme Court, where the environment clearance was ultimately revoked and the project relocated.

Increase capacity to monitor compliance

PPPs require stakeholders to invest in new skills and technical expertise in order to implement these technical contractual arrangements. Without capacity building, and with the recent boom of PPP in India, there is a risk that an opportunity for greater transparency and regulation is missed and that instead rent seeking and corruption become quickly entrenched in the procurement model. This eventuality would, needless to say, be detrimental to VfM.

Opportunities to deliver VfM are also being missed in the implementation of the safeguards. There are widespread capacity gaps afflicting the implementation of the social and environmental safeguards addressed in this report, particularly relating to the monitoring and reporting on performance. At the MoEF, only six regional offices are responsible for assessing the monitoring reports of thousands of ongoing projects. Each month, approximately 60 new projects are cleared, and anecdotal evidence has been provided to attest that developers do not take reporting seriously and sometimes merely photocopy previous reports. There are virtually no checks, punitive measures, or any other consequences to poor reporting, and this is intimately linked to the widespread knowledge that the MoEF does not have the capacity at present to keep abreast of developments. While there are occasional fines issued for violation of the environmental safeguards, they are not of a significant enough value to act as a deterrent to noncompliance.

On paper, India's regulations are on par with global best practice, but compliance verification systems are either weak or non-existent. This is due to lack of capacity. It is beyond doubt that up-scaling is needed in order for better decisions to be taken on questions of sustainable development. This will unavoidably bring more transparency to PPPs. Concerted thinking and discussion with stakeholders is required in this space.

2. MOVING BEYOND THE EXISTING SAFEGUARDS

These recommendations go beyond implementation of environmental and social safeguards. They promote the adoption of wider environmental, social and economic parameters that will increase value for money of PPP projects across their life cycle.

Explore new ways to financing sustainable infrastructure

In India, to date, debt financing has largely been led by the banking sector. However, commercial banks are facing difficulties as they have already reached their lending exposure limits for the infrastructure sector and face problems of concentration risks and asset-liability mismatches. Despite that, commercial banks continue to lead infrastructure financing in India, as the Indian bond market has not matured sufficiently to address the needs of such projects, and institutional investors face strict regulations that prevent them from investing in risky projects. To address the financing gap for sustainable infrastructure, the analysis in this sub-section looks at how some of the existing infrastructure funds can be attenuated to fund green infrastructure.

a. **The Viability Gap Fund (VGF)** is a one-time capital grant provided to infrastructure PPPs that are economically justified but are not completely financially viable. The lack of financial viability might arise due to a multitude of systemic risks, including demand, supply, legal and environmental risks that cannot be adequately captured in the ascertaining of a project's NPV. This includes challenges to increase user charges to commercially viable levels. The VGF is awarded at the construction stage of a project and is equivalent to the lowest bid for capital subsidy, but subject to a maximum of 20 per cent of the total project cost. Sponsoring ministries, state governments and statutory entities are also able to provide additional funding up to a further 20 per cent of the total project cost.

   An effective way to facilitate green infrastructure projects will be to peg this additional 20 per cent of the VGF grant to the extent to which environmental and social sustainability is incorporated into the siting, design and construction of the project. Hence sustainability performance becomes a requirement to access this additional

funding. Sustainable infrastructure projects in India will typically require higher capital expenditure, which may be recovered during the operation phase of the asset. Therefore the total VGF of 40 per cent of total project cost is essential to achieve bankability for kick-starting green infrastructure.

b. **Infrastructure Debt Funds (IDFs)** in India are structured in two forms: a) the Mutual Fund-type Infrastructure Debt Funds that allow investors to pool and diversify their investments across a range of infrastructure assets; b) Non-Bank Finance Companies (NBFC) that target projects that have completed one year of commercial operations. NBFCs can also implement credit-enhancement mechanisms to achieve a credit rating that would be acceptable to institutional investors. The NBFC can also issue bonds in both Rupees and foreign currencies. For example, the India Infrastructure Finance Corporation (IIFCL), in partnership with the Asian Development Bank (ADB), offers credit enhancement to infrastructure companies to help them bolster their credit ratings and access the bond market for long-term funding.

   Within this framework, infrastructure companies can explore the possibility of setting up specialized green infrastructure debt funds that will target investment in green infrastructure. Multilateral agencies and institutions such as IIFCL could assume the higher risk tranches of the fund, enabling the institutional investors to step in and take those that are investment grade. The reductions in withholding tax and the income tax holiday will be critical to ensure the viability of a green infrastructure fund until technology risk are lowered and green infrastructure markets mature.

c. **The bond market** in India comprises issuances by both central and state governments, financial institutions, banks and corporations. However the corporate bond market is currently highly underdeveloped and lacks liquidity and depth. As described in the discussion on IDFs above, India Infrastructure Finance Corporation (IIFCL), in partnership with the Asian Development Bank (ADB), has begun to offering credit enhancement to infrastructure companies to improve their credit ratings and access the bond market to tap long-term funds (IIFCL, 2013).

   Building on this structure, the IIFCL and ADB could explore the possibility of providing higher credit enhancement for sustainable infrastructure companies that wish to issue green bonds. To promote sustainable infrastructure, **green bonds can be viable in the Indian context since a liquid market in green infrastructure bonds creates lower exit costs for the construction phase capital, as well as for the longer-term project finance debt held by banks with constrained balance sheets**.[20] In the early days it will be pertinent for governmental financial institutions to play the market-maker's role in order to ensure liquidity on the green infrastructure bond market.

d. **The Takeout Finance Scheme** has been implemented by the Infrastructure Finance Company (IIFCL) as part of the stimulus package established by the Indian government to capitalize infrastructure the India. The main purpose of the Takeout Finance Scheme is to solve asset liability mismatch issues in the banking industry. Banks in India suffer asset liability mismatches because the payback period for infrastructure projects are too long. Banks deposits are for one month to five years. Thus they have problems giving, for example, 15-year infrastructure loans. The balance sheet of banks loaded with long-term infrastructure loans will be off-loaded with the help of take-out finance performed by the infrastructure debt funds (IDFs).

   IIFCL is acting essentially as a vehicle for refinancing existing debt. In this way, it creates fresh space on the banks' balance sheets in order to lend to fresh infrastructure projects. It takes over loans extended to infrastructure projects which are created through PPPs and have successfully completed their construction and are in a stable operation period. **This Takeout Finance scheme is preventing any possible asset-liability mismatch from the banks and at the same time achieving a higher credit rating, but is not, however, prioritizing banks that are socially and environmentally responsible. This idea should be explored further.**

e. **Sovereign Wealth Funds**

   Sovereign wealth funds (SWFs), are state-owned investment funds and long-term investors that are progressively diversifying away from the traditional international financial markets and looking into investment opportunities. **They are nowadays an important source of capital for infrastructure development internationally**.

   Large SWFs have been actively undertaking infrastructure investments for many years now. Some SWFs accept higher risks and lower returns than fully commercial investors and their policies seek to contribute to economic growth and poverty reduction. For example, the Norwegian Government Pension Fund–Global and UAE–Mubadala Development Company have strong sustainability policies for investments and have a focus in sectors that could benefit India´s green infrastructure needs.

[20] See "Creating Wealth Worth Having," Climate change capital. 2013

There are options for SWFs to work in partnership, either with the Indian government, with development finance institutions, or with other private sector investors. SWFs may also set up, alone or in cooperation with others, their own general partnerships dedicated to particular investment themes, for example, green infrastructure.

For the host country, however, there is no denying that the acquisition of, or investment in, key infrastructure assets by foreign state-owned entities as the SWFs can lead to legitimate policy concerns. At the same time, the significant financing gap across the developing world for infrastructure looms large. Attracting the correct SWFs, with strong environmental policies, could present a significant opportunity for the Indian green infrastructure market.

f. Green funds

The Global Environment Facility (GEF) provides new and additional grants and concessional funding to cover the "incremental" or additional costs associated with transforming a project with national benefits into one with global environmental benefits. The aim of the GEF is to assist financing the protection of the global environment, and to promote environmentally sustainable development. For example, it supports projects in climate change mitigation and adaptation, such as reducing of avoiding greenhouse gas emissions in the areas of renewable energy, sustainable transport, energy efficiency and sustainable management of land. The GEF has already worked with India in projects with United National Development Program, United Nationals Industrial Development Organization, the International Bank for Reconstruction and Development and the Asian Development Bank, among others. Today the GEF has particular programs for PPPs that could be of interest in the Indian context.

Use existing infrastructure sustainability rating tools to assess, improve and communicate sustainability performance

Inherently, sustainability is multi-faceted, and specifics will vary from one context to another. This makes assessing and further improving the sustainability of infrastructure projects a complex and challenging task. To this end, it is recommended to draw on existing best practice schemes from around the world. A powerful tool is the Infrastructure Sustainability rating scheme for infrastructure developed by the Infrastructure Sustainability Council of Australia (ISCA).[21] It is a comprehensive rating system for evaluating sustainability across design, construction and operation of infrastructure. Through a user-friendly spreadsheet format, numerous variables can be entered regarding virtually all facets and materials of a given project. The results can then be used to benchmark the project. Through the various scales in each category, the tool also provides guidance on increasing sustainability and thereby improving the rating. Also of value are the various authoritative green building standards, including LEED, BREEAM and Green Star, which provide intelligence on how to improve the environmental performance of buildings. An advantage of the above and other schemes for improving infrastructure sustainability is that they allow independent auditing and thereby credibly communicating sustainability efforts to stakeholders. Regarding direct costs, O&M expenditure is usually lower for green infrastructure compared to traditional projects.

[21] See: http://www.isca.org.au/is/about-is/is-rating-tool

CONCLUDING REMARKS: MOVING TOWARDS A "STRATEGIC" VFM MINDSET

This study makes the case that if PPPs are to trigger sustainable growth in India, the interpretation of VfM must take into account environmental and social costs, risks and gains across the project life cycle. This implies that policy-makers and investors must recognize that environmental and social improvement can reduce risks across almost all categories of financial risk. Governments also have a fiduciary duty to protect the interests of its citizen and as such, have the responsibility to build in environmental, social and wider economic externalities whenever it activates its purchasing power. Otherwise taxpayers are being short-changed.

The Government of India boasts a vibrant PPP market and best-in-class institutional and legal frameworks. Challenges that remain are linked to implementation, capacity, decision-making and moreover, the mindset. The latter is perhaps the most critical and the most difficult to change, not just in India but all over the world. One reason for this is that decision making tends to be too short-term. Governments focus on their term in office, investors focus on their annual balance sheet—and with this cue, other PPP stakeholders align their commitments in a similar fashion.

Building sustainable infrastructure inherently requires long-term perspectives. It also requires bold leadership: governments who will assume the preliminary financial and commercial risks and reward the early investors that are willing to meet the higher costs of capital and invest in clean technologies, green architecture, green engineering, and projects that build knowledge and skills across India. In other words, sustainable infrastructure requires a more holistic and strategic interpretation of VfM.

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