

## CHAPTER V

### MOVING TOWARDS SUSTAINABLE INFRASTRUCTURE DEVELOPMENT

#### 5.1 Sound Planning

The first principle is sound planning. Current infrastructure projects do not adequately account for the environment in their planning stages. The primary method for accounting for the environment is the process of undergoing an environmental impact assessment (EIA), prior to the approval of any infrastructure process. Nearly all development agencies conduct EIAs before projects, however too frequently these assessments are ignored when their recommendations prove to be too costly or inconvenient. However, in many cases just conducting an EIA is not sufficient. The findings of the assessment should be utilized to assess the economic value of the land under threat, so that value can properly be applied to the project's cost/benefit ratio. Environmental valuation is a key step towards ensuring that projects do not diminish the natural capital stock. These steps insure that as many environmental externalities as possible are removed in the planning phase of a project, while also discouraging less-beneficial, or unnecessary development. Not only did the ADB fail to conduct effective EIA's but they also did not correctly use the information that was gathered in order to determine the value of the land they were degrading in order to incorporate that data into the project's cost/benefit ratio. This process of environmental valuation is a relatively new and valuable process that should be quickly adopted by future Bank projects.

In regards to Highway 9 and the EWEC, the Asian Development Bank long ago adopted a policy of commissioning EIA's before the start of a proposed project, although issues regarding the transparency and effectiveness of their processes exist. Most of the ADB's EIA's are not made available to the public creating an information gap between the public and investors<sup>18</sup>.

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<sup>18</sup> The ADB.org database contains the EIA for only one corridor related project, a stretch of the North-South Corridor running through Lao PDR. The EIA for the EWEC and Highway 9 improvements is conspicuously absent from their records.

Although the EIA's are released for public comment 120 days prior to Board consideration of the project, judging from the lack of GMS environmental community critiques re-submitted to the ADB this opportunity to influence project proposals is not being taken advantage of (WWF, 2005). Furthermore, the fact that these EIA's are not made available during and after construction makes it difficult for the public to monitor its results and ensure that the EIA's recommendations are implemented. Without this system of checks and balances there are concerns that EIA recommendations can easily be outweighed by an investors desire to push a project through approval to completion (WWF, 2005).

In addition to a lack of public participation within their assessment process, the ADB also failed to integrate its assessments across sectors and geographical areas. The WWF (2005) has suggested that EIA's regarding the transport corridors should include all environmental dimensions; including physical, sectoral and corridor, rather than sticking to just one distinct level. Also, at the corridor level, economic and environmental plans need to be integrated in order to propose methods for cumulative environmental assessment and anticipatory planning which can create a comprehensive corridor development plan that is sustainable, maintains critical ecosystem services and future options, and conserves important biodiversity (WWF, 2005).

The aforementioned lack of public participation or consultation is a glaring deficiency in Highway 9's assessment process. Public consultation is an essential part of the EIA process because it helps to identify potential undesirable impacts and while influencing project design. In many cases it provides the only way for the affected local population to add their perspective to the proposed project design and potential alternatives. Furthermore, as the World Bank notes, public participation can also help to identify and design suitable mitigation, monitoring, and management measures for harmful effects, while providing a way for consulted groups to take an active role in monitoring the project's implementation, a point that will be expanded upon in the next section (WB, 1994).

A shift to meetings involving active discussion with affected communities rather than relying on passive dialogue or opinion surveys is necessary. Furthermore, in instances where

locals may not be able to fully comprehend the environmental risks of a given project stronger consultations with local NGOs and affected community representatives needs to be significantly increased. While greater efforts to target special groups, like women or the poor, are needed in many cases. Finally, as the case of the EWEC can attest to, the documentation of these processes needs to be improved, not only to improve the transparency of the assessment process, but also to give stakeholders and NGOs enough time to comment and provide feedback on its findings.

An environmental assessment plan is needed, beginning with the identification of important natural systems and environmentally sensitive areas, recognition of existing protected areas and potentially significant habitat and migration linkages between them, and assessments of the ecosystem services which the corridor's natural assets are providing to local and regional development (WB, 1994). The implications of proposed corridor development programs on its natural assets need to be assessed and various scenarios for development analyzed. Furthermore, a common outline of environmental safeguards needs to be defined as conditions against which all development in the corridor would proceed.

As I have stated, the main purpose of an environmental impact assessment is to assess the environmental impacts of a given project, and a negative impact would typically be one that adversely affects the natural capital stock. So does this mean that any project that contains an element which negatively affects the natural capital stock, even in the slightest bit, is unsustainable? Not necessarily, because quite frankly all natural capital is not of equal value. Growth-centric economics and development economists alike (i.e. David Pearce), would agree that there are an array of costs and benefits of manipulating the natural capital stock. If it is reduced, it should be for some significant positive gain; for example, the clearing of tropical forests in order to make more land available for agricultural cultivation (Pearce, 1989). Another example would be wetlands, which are drained in order to create more fertile soil for crop growing, land for housing developments, etc. Thus each destructive action has benefits in terms of the economic or social gains based off of the use to which the land is put (Pearce, 1989). However, environmental degradation also includes sever economic costs because of the reliance on the environmental functions which they serve to maintain (such as clean water, air, etc.) or the resources that they provide to mankind (food, timber, forest products, etc.). If the land is

converted for some other purpose these 'use' benefits are lost, along with their own intrinsic economic worth. Furthermore, according to Pearce (1989), natural environments also have value beyond their uses, indeed many people like to think that environments should be preserved for their own sake, an 'existence value.' Environmental valuation is the process of adding both these 'non-use' and 'use' values in order to get the total economic value of the conserved resource or environment (Pearce, 1989).

There is a significant need for environmental valuation to be included in a project's environmental impact assessment. Frequently environmental effects caused by development projects occur outside of market exchanges and thus are not officially priced during the planning process, and are often excluded completely from economic consideration's concerning the projects impacts (Ekins, 2002). Thus infrastructures externalities frequently generate much more economic harm, through environmental degradation, than anticipated, a point illustrated by the deforestation along Highway 9 and its accompanying costs. One version of environmental valuation, as illustrated by Pearce (1989), seeks to determine the total economic value (TEV) of an ecosystem. It can be expressed as:

$$TEV = \text{Direct Use Value} + \text{Indirect Use Value} + \text{Option Value} + \text{Existence Value}$$

Pearce (1989) defines the direct use value as relating generally to the production of at least potentially quantifiable, marketable outputs; the indirect use value as relating to other uses of the environmental functions; the option value as relating to people's will to sustain these functions for potential future use even if they are not being currently utilized; and the existence value as relating to people's desire to maintain these functions irrespective of their use.

To date few infrastructure project EIAs have included an economic valuation of environmental costs and benefits. Thus full appreciation for the lost natural capital and environmental functions is not realized until they are gone. In order to properly weigh the costs and benefits of a project in its planning stage environmental valuation needs to be included in the assessment process. Yet these forms of valuation do have their limitations. For instance, they are not able to realistically assess the costs of global environmental catastrophes, to which an

individual project could contribute even if in an almost immeasurably small capacity. Examples of unaccounted for costs that Ekins (2002) notes include:

Displacement of millions of people from low-lying coastal areas (global warming); hundreds of thousands of extra eye-cataracts and skin cancers (ozone depletion); other processes of large-scale environmental degradation, such as current rates of deforestation, desertification and water depletion, which entail considerable national or international threats to life and livelihood; the possible unraveling of ecosystems (species extinction); the persistent release of serious toxins (e.g. radiation) or the effects of major disasters (e.g. Chernobyl, Bhopal).

These costs certainly need to be accounted for, because in many ways they represent the ultimate form of environmental unsustainability. Thus a refinement of these valuation methods, which allows them to consider non-economic costs as well, may be in order.

Environmental valuation serves the purpose of assessing the economic value of an ecosystem (or part of an ecosystem) in order to understand the costs associated with its loss or reduction. Once the value of an ecosystem has been determined, and the cost of its loss calculated as well, these costs can be weighed against the potential benefits of a project, in order to determine the net economic gain, and help decide whether or not the project is worth pursuing. The most common way to weigh these complex variables is through a cost-benefit ratio.

Cost-benefit analysis (CBA) is a rationale approach towards assessing the potential costs and gains from a project by determining a total net gain for the development. Yet, as Pearce (1989) points out, what constitutes a gain or loss depends on the project or the objective function chosen. However, most cost-benefit analyses operate with economic efficiency as their chief desirable variable, but this is only one example and in many cases a specific analysis is truly unique to an individual project (Pearce, 1994). Sustainability can be factored into a cost-benefit analysis by setting a constraint on the depletion and degradation of the natural capital stock (Pearce, 2004). This would mean that the variable for economic efficiency should be altered to require that all projects producing net benefits should be subject to the requirement that environmental damage should be zero or negative before being considered for implementation (Pearce, 2004). However, as Pearce (1994) points out, at a micro-level these criteria would be

stifling, preventing nearly all projects from ever getting off the ground. Yet, at a macro, or program level, this would be much more feasible, for instance, if spread out across a group of projects, the sum of individual damage should be zero or negative (Pearce, 2004). For example, specific sections of a road construction project, like Highway 9, might not meet this criteria, due to variations in terrain, construction intensity, etc., however what is important is that the larger project taken as a whole, like all of Highway 9 or even the EWEC, meet this standard.

Like environmental valuation, cost-benefit analyses also have to be adapted in order to consider global environmental issues. For example, a hydropower program may have a negative environmental impact through deforestation, land degradation, or water depletion, but a positive impact on carbon emissions, by providing carbon-neutral energy. Accounting for complex environmental trade-offs like this require significant coordination among a variety of local and global actors, a role that international organizations like IUCN or WWF are uniquely positioned to fill.

Of course environmental impact assessments, environmental and cost-benefit analyses are only useful if they actually have the power to influence a project. In other words, these steps need to be considered seriously enough that if the CBA shows a net loss for a project than that project should be changed or halted, something that rarely happens in practice. This is why it is important to consider alternatives to projects; in case the costs of one option are too steep it can be easily adapted or changed to minimize its ecological impact.

In summation, sound planning is the first principle of sustainable infrastructure development because if conducted properly it allows developers to minimize the environmental impacts of a project before it has been initiated, and the damage has already been done. Proper planning for an infrastructure project should include a comprehensive environmental analysis which, conducted at multiple levels and incorporating significant public participation and transparency. Furthermore, realistic alternatives need to be proposed in case the original plan is unfeasible. Environmental valuation, which assesses the economic value of the affected ecosystem, in order to the project's cost-benefit analysis, which weighs predicted pluses and minuses in order to determine net gain, must also be included. However, it is important to note again that

none of these steps matter if they are not given serious consideration during the planning phase, and carry the authority to seriously alter or stop a proposed project. If these points would have been more vigorously applied during the planning phase of Highway 9, then perhaps the effect of the road on the region's natural capital stock would be less severe, and the adverse ecological effects being experienced by the local population could have been mitigated.

## 5.2 Sound Implementation

Sound project implementation is another factor that can help reduce the impact of infrastructure development on the natural capital stock. The best planned project, with an elaborate assessment and valuation process, does not enhance the sustainability of a project if during the construction process the principles of sustainable development are ignored. Frequently externalities spring from the actual construction process of a project; adverse effects that could have minimized or eliminated through sound construction practices. It is important to note that the impact I am referring to goes beyond what is specifically required for the project. Thus, sound implementation specifically refers to the construction process, and a developer's ability to minimize its impact on the natural capital stock. The planning process should provide a blueprint for this phase to be successful, and it is up to monitoring agents, to see that the EIA is adhered to. Monitoring will be discussed in detail in the next section.

This point is left deliberately vague, because the efforts required to achieve sustainable implementation of a project can vary from location to location. However, one central theme remains: The natural capital stock should be left as unaffected as possible during the construction process. While it is difficult to outline guidelines for how to achieve sustainable implementation, identify unsustainable practices is fairly simple, and fortunately or unfortunately Highway 9 provides many examples.

In many ways, the construction of Highway 9 in southern Lao PDR, due to the neglect and lax standards by construction crews, wreaked great harm on the regions delicate ecosystems. As discussed earlier Highway 9 traverses a broad array of terrain, starting at the Mekong's

lowland plain in the west and then ascending into tropical highland forest as the road threads east towards the Vietnamese border. In order to adjust for such diverse geography, construction was divided into several segments, or stretches of road, on which individual crews were responsible for building their own pieces of the highway. During the construction period monitoring was conducted by several independent organizations, including the World Conservation Union. IUCN conducted four monitoring trips during the project's lifetime, however I have chosen to largely reference the first one because it covers the first phases of the highway's construction, which also happen to be the most severe impact on the natural capital stock. As discussed in their previous chapter their reports note a wide range of harmful, and preventable, construction practices which greatly jeopardized the sustainability of the project.

The construction of Highway 9 has had a larger effect on the natural capital stock than what was necessary in order to complete the project. At the construction sites, as well as the associated excavation quarries excess forest clearing and the diversion and blockage of water channels has led to several problems including erosion and the degradation of water quality.

Unfortunately most of these adverse effects could have been avoided through more diligent care for the environment on behalf of the contractors and construction crews. As mentioned before, methods to minimize the project's ecological impact at construction sites include proper management of excess soil. It should not be dumped in areas where it could possibly restrict the natural flow of water or inhibit channels that are formed during the rainy season. Furthermore, although it is inevitable that in certain instances the path of the highway will block channels, the road should be designed to minimize this, and in instances where blockages are inevitable proper diversions should be built. However, the single most important thing that contractors could do to limit their impact is by not clearing the forest except where it is absolutely necessary for the course of the road. Deforestation contributes to all of the factors above while also eroding the livelihoods of local people and seriously damaging the region's ecosystem.

Unexpected degradation of the natural capital stock however is in some cases inevitable, and should be accounted for in the cost-benefit analysis. Much of the time, the focus at the construction site should be on mitigation of harmful effects, because some are impossible to



foresee or prevent. However environmental degradation associated with the construction of Highway 9 was not unique to the construction sites themselves, serious environmental degradation, albeit on a smaller scale, was also occurring at the construction camps, where crews lived during the duration of the project. Offenses include the erosion of land quality through chemical contamination and improper waste disposal, the erosion of water quality through improper waste water management and pollution, and significant pressure on the surrounding forests through unnecessary deforestation and the killing of local indigenous wildlife. Degradation of this kind is completely preventable and thus can be considered the most significant implementation failure on behalf of the contractors and management who oversaw the construction of Highway 9.

These environmental issues at the camps are the most glaring because they are easily preventable. It is imperative that proper waste disposal procedures, for both solid waste and wastewater be implemented in future construction projects, while proper environmental monitoring, a point that will be elaborated on soon, needs to ensure that it is enforced. Furthermore, camps should be erected in areas that are naturally clear, or have already been cleared, in order to minimize deforestation, and erosion control should be a constant priority. Finally, under no circumstances should construction crews rely on indigenous animal populations to supplement their diets, while instances of animal poaching should be punished.

Sound implementation of an infrastructure project relies entirely upon the contractors following the steps outlined during the planning phase and not contributing unnecessarily to the ecological footprint of the project. In the case of Highway 9 environmental degradation far outpaced what was required in order to complete the project. The recommendations provided above could have prevented much of this damage, and indeed could serve that purpose during future projects. However, far too often contractors are left on their own to do the right thing, which they rarely make the extra effort to do. Thus the only way to ensure sound implementation is through frequent and independent monitoring and regulation.

### 5.3 Effective Monitoring

Effective monitoring is essential in order to ensure that decisions made during the planning phase, regarding the EIA etc., are upheld and to guarantee that contractors follow accepted environmental standards. During the duration of Highway 9's construction, a period spanning several years, monitoring was conducted by independent organizations like IUCN. This is not an effective monitoring tool. For instance, IUCN was only able to send out teams on four occasions, not nearly frequent enough to prevent crews from causing the damage mentioned above. This responsibility should ideally be fulfilled by the public sector, which unfortunately in Lao PDR lacked the capacity to do so. Thus, it is a priority of sustainable infrastructure development for governments to establish their own independent and capable regulatory bodies in order to monitor the infrastructure development projects occurring within their borders.

Although the foundation of a regulatory framework for infrastructure might sound straightforward, it is important to note the point which prevented this process from occurring in Lao PDR; quite simply, in many developing countries regulatory capacity is not high enough to effectively monitor projects on this scale. Thus, capacity building, in regards to government regulatory bodies is a priority of sustainable infrastructure development. As Brook and Irwin (2003) note, modern infrastructure regulation is comprised of a series of demanding tasks, requiring a team with skills in economics, finance, law, and other disciplines, as well as integrity and some measure of political shrewdness. Yet as mentioned above, specialist skills of this type are limited commodities in many countries, while attracting and holding on to experienced professionals can be difficult in the face of the significant salary restrictions often placed on the civil service (Brook & Irwin, 2003). In order to counter this Brook and Irwin (2003) argue that it is important to provide regulatory institutions with more flexible salary arrangements than the general civil service. It is also important to try to ensure that the regulator has access to secure funding in order to cover the costs accrued while on the job (Brook & Irwin, 2003). Furthermore, regular training of regulators should be implemented, and a system in which a percentage of funds earmarked for specific infrastructure projects go towards regulatory training could be a permanent solution to this issue.

Active public participation is also an essential part of the monitoring and regulatory process. No matter how competent, in order to make sound decisions regulatory bodies need access to reliable information (Brook & Irwin, 2003). This can include different perspectives regarding the implementation of a project as well as on the needs of local stakeholders. Furthermore, as Brook and Irwin argue (2003), engaging stakeholders can also have a positive effect on the quality of regulatory assessments, as well as enhancing the perceived legitimacy of the regulatory process. However, in order to manage the conflicting values of such a wide variety of stakeholders, regulatory independence and transparency are both important prerequisites, something that will be discussed in greater detail in the section on accountability.

Although a strong regulatory capacity is important, the responsibility for monitoring the quality of a project is shared by a wide variety of actors. Where institutional capacity is weak, like in Lao PDR, community organizations and non-governmental organizations, including dedicated consumer organizations have a role to play in monitoring performance and quality, disseminating information, and applying pressure for improvement. Yet, as Brook and Irwin (2003) point out, organizations like these can be easily captured by political or other interests, thus maintaining a fair and balanced approach can sometimes be difficult on their part. However, although these supplementary monitors fulfill a valuable role, as the example of Highway 9 has shown, this type of monitoring is not sufficient on its own.

Reliable and consistent enforcement is extremely important while monitoring the quality of infrastructure implementation. Indeed, the actions outlined above, such as setting standards, etc., is pointless if the bodies responsible for regulating quality cannot or does not enforce them. Brook and Irwin (2003) note that different methods of enforcement have different costs, according to who is conducting the monitoring and how frequently checks are being made. In instances where regulators hold a high degree of confidence in the contractor, they can be made indirectly responsible for monitoring their own performance versus established quality (Brook & Irwin, 2003). In some cases, especially those in which monitoring requires close involvement in daily construction work, this can be a useful tool for cutting regulatory costs (Brook & Irwin, 2003). On the other hand, if confidence in a contractor is low then the regulatory body may

choose to monitor directly, either through random or constant checks, despite the probable increase in costs (Brook & Irwin, 2003).

When infractions are found appropriate penalties should be levied, either to the regulatory body or to a specific entity. Some regulatory frameworks require that penalties are paid each time an infraction is committed, however others simply tally up the damage at the end of a project and charge a lump sum; both methods are of course completely viable and should be adapted to the circumstances (Brook & Irwin, 2003). Unfortunately the competency and transparency needed to implement such a system of penalties is beyond many governments in the developing world. Thus the need for capacity building is once again highlighted as a priority.

An alternative method for monitoring and enforcing the quality of infrastructure implementation and provision, which might hold considerable appeal in the case of Highway 9 and Lao PDR, is to provide customers with the opportunity to claim compensation when the infrastructure provider has failed to comply with established standards. For example, companies would need to pay a specified amount of money to customers who claim to be affected beyond what was implicitly outlined in the projects planning phase. Furthermore, a contractor might also be liable if they do not answer a customer claim within the specified time (Brook & Irwin, 2003). This form of compensation might be useful in the case of Highway 9, where farmers whose fields have been ruined by erosion, or whose water sources have become turbid can make claims against offending contractors. Furthermore, the prospect of having to make such compensations for infractions should serve as a stronger motivator for contractors to follow their environmental impact assessment and place as little strain on the natural capital stock as possible. Yet Brook and Irwin (2003) note that processes like this might be difficult to establish in developing countries, as it can lead to a penalty market, with customers making false claims so as to obtain a payment. Thus firm regulation can clear guidelines for such a system would be necessary. Brook and Irwin (2003) also view the courts as potentially functioning as a place where consumers can raise complaints against providers for inappropriate quality or failure to follow prescribed standards. They note that the threat of a court case can be assimilated as a powerful enforcement mechanism, although as alluded to previously, its effect could be diminished in developing

countries where corruption and transparency in the justice system are serious issues (Brook & Irwin, 2003).

Thus in summation, although the independent monitoring offered by IUCN for Highway 9 was a desirable component of what should otherwise be a complete monitoring process, it alone is not sufficient. For the most part governments need to be responsible for monitoring their own projects, a task which requires competent regulatory bodies. Although many developing countries do not currently possess this capacity it is a priority of sustainable infrastructure development to establish it. Once established, competent regulators should be able to ensure that contractors are punished when they ignore environmental standards while providing a mechanism for stakeholders to be compensated for poor infrastructure provision. Unfortunately this is not as simple of a task as it seems, and in many countries issues such as transparency, corruption, and poor governance can inhibit reliable and honest infrastructure regulation. These issues are the focus of the final principle of this sustainable infrastructure development framework. It is a point sorely lacking in most infrastructure sectors, notably in Lao PDR, accountability.

#### **5.4 Accountability**

Poor accountability is most recognizable when it is absent. As discussed in the previous section competent monitoring and regulation is the key to ensuring that contractors do not value the terms of the projects impact assessment while keeping their impression on the natural capital stock to a minimum. However, effective regulation is largely predicated on a government's ability to effectively govern in a transparent manner, a quality sorely lacking in heavily bureaucratic and corrupt Lao PDR. Thus the fourth dimension of sustainable infrastructure focuses on good governance and decentralization in order to promote regulatory capacity and root out corruption.

Introducing competition and private provision of infrastructure services can go a long way towards correcting these issues. However, because the root of the problem is essentially

poor governance no long term solution can be achieved unless the quality and standards of government management and operation is improved. Thus, one of the core preconditions for government accountability in regards to infrastructure is good governance. Decentralization, already a large priority in East Asia, can play a significant role in improving governance. Yet in the region decentralization has been a slow and relatively recent trend, but nevertheless the ADB has touted initial gains, claiming that in a space of less than 20 years significant reform has taken place (ADB, *et al.*, 2005).

Decentralization is the process of redistributing power and authority, which had previously been held by the national government, and transferring it closer to the people, at the state, provincial or local levels. This process can contribute to economic growth by placing the decision-making power closer to, or at the level of the means of production, allowing for more efficient resource allocation. In regards to governance and infrastructure, decentralization can streamline the planning process by giving those with greater knowledge of specific projects and their affected areas more control over decision-making. The crux of this argument is that local governments are in a more advantageous position to know what is best in regards to the development going on in their jurisdiction. Furthermore, by redistributing power from the center to the provinces, local communities are able to gain a greater sense of participation in the planning phase of a project through increased access to policy-makers. Through this change, communities living along Highway would have been able to police construction activities and helped ensure that potential livelihood-damaging actions would be minimized. Thus, decentralization could improve several of the issues relating to the planning and monitoring process discussed above.

However, decentralization is not a sufficient tool to promote good governance unless it is implemented alongside a variety of methods. Capacity building or the process by which local and national governments are given the training and tools to more efficiently and reliably execute their jobs is a key component of improving government. In some instances donor agencies, like the World Bank (1994) for example, have recognized this need for improved capacity, packaging training along with projects. Yet most of this has been centered in the planning phase, focusing on improving the environmental assessment capacity of local communities, and although this

certainly is needed it is not sufficient. External training of this type should target both government agencies, national, provincial, and local, as well as the nongovernmental sector, including private sector representatives, banks, universities, and local NGOs.

In addition to decentralization and capacity building g additional measures are needed in order to break the corruption which is endemic in infrastructure development throughout much of the development world. Introducing competition and a transparent bidding process is an essential part of limiting corruption and monopolies, and indeed would be a significant step towards improving road construction projects in Lao PDR, where the construction sector is dominated by a handful of foreign and local firms. Competition, in addition to breaking traditional monopolies over service provision, can also introduce a variety of benefits in regards to the quality of infrastructure, many of which have previously been mentioned. An additional benefit though is that competition provides consumers with options. Generally if a customer is unhappy with an unreliable, low-quality or expensive service they can go elsewhere. Yet this is not possible in a monopoly setting. The concept of consumer choice is an additional incentive for providers to improve the quality of their output.

However, the potential for true competition varies by sector for a combination of reasons, including several of infrastructure's unique qualities which have been previously mentioned, including economies of scale, and 'lumpiness' etc, as well as the political implications of infrastructure development. According to the ADB et al. (2005), the 'standard model' for promoting competition, along with transparent bidding, is to unbundle utilities, both horizontally and vertically, while rigorously implementing private sector provision where possible.

Of course some sectors are more compatible with competition and private provision than others. The water distribution sector for example, where markets tend to be small and more local, and the costs of transmitting water of large distances is great has clear limits in its scope for harnessing competition in the market. Although some countries have implemented third-party water provision with some success (England and Wales for example) the barrier to introducing competition in this sector is still too great in most countries (ADB, *et al.*, 2005). However, through a fairly common practice in East Asia, there can still of course be competition for the

market through a bidding process for concession rights (ADB, *et al.*, 2005). Yet in sectors, like telecommunications, energy, and transport provision the introduction of competition is much more feasible. Although much progress has been made towards introducing competition into East Asia's traditionally monopoly dominated infrastructure sectors over the past few decades the market is still anything but free and open, and several monopolies still persist.

Decentralization, capacity building, and competition are all viable tools to bring good governance and lower corruption in East Asia's infrastructure sectors, however the primary way to tackle these problems and increase the transparency of infrastructure is through the regulators discussed in the previous chapter. As noted in the previous chapter, where competition does not ensure reliable infrastructure provision and quality, then regulation is needed to bring accountability to infrastructure service providers. However, regulators in developing countries are themselves not immune to corruption, indeed the reality is quite the opposite, particularly in East Asia where *prides* and *patronage* frequently prevent regulatory actions from being conducted. Thus, while it is important to regulate infrastructure provision it is equally important to regulate the regulators.

How do you hold regulators accountable? The ADB *et al.* (2005) provide a few recommendations including (p. 133):

- Writing statutes that clearly specify the rights and responsibilities of the regulator, and explain how to prioritize when there are multiple objectives
- Allowing judicial review or effective arbitration of regulatory decisions
- Requiring the production of annual reports and subjecting the performance of the regulator to independent audit or parliamentary review
- Ensuring meritocratic appointment and removal of regulators; and allowing stakeholder submissions on issues under review.

In addition to introducing accountability regarding regulatory decisions, these steps can also help to improve the quality of such decisions which increasing the efficiency of the regulatory process. Other measures are designed to enhance regulatory transparency. Methods successfully employed in some countries include, requiring regulators to publish decisions and rationale (like in the Philippines for example), as well as licensing and benchmarked performance indicators for



regulated service providers (Indonesia) (ADB, *et al.*, 2005). Even more formal approaches include, regulatory hearings like those held in the United States (Brook & Irwin, 2003). Or the formation of specialist consultative or advisory committees, an approach utilized in the United Kingdom. Yet as Brook and Irwin (2003) note, although these approaches may vary, and should be tailored to a specific country and governmental framework, one key unifying feature is their embrace of transparency, which is necessary in order to ensure accountability, to grant assurance to stakeholders, and to increase the predictability and impartiality of decisions.

Yet as the ADB *et al.* (2005) points, such measures cannot ignore the fact that in general infrastructure development is an intensely political process, thus the accountability of the regulatory process and those that oversee it cannot be divorced from broader institutions of political accountability. Thus, improvements are generally needed across the board in most developing countries. However, as so far as possible, it is desirable to separate regulators from the political process. In fact, as Brook and Irwin (2003) point out, within development circles it is now widely accepted that regulatory bodies for infrastructure need to be independent, in other words they should always operate at arm's length from regulated firms and political authorities. The rationale beyond this statement lies in the fact that if a regulatory body successfully does its job, then the interests of the regulator and of regulated firms will often be in conflict (Brook & Irwin, 2003). Indeed this conflict of interest is one of the main arguments for private sector participation, naturally separation between regulators and regulatees is more easily accomplished between the government and the private sector than it is between two government agencies. Furthermore, regulatory independence also facilitates competition in the way that in a competitive market, relationships between regulators and private firms make ensuring a level playing field impossible (Brook & Irwin, 2003). Yet, like anything in development, ensuring that regulators are independent of the political process hinges on a variety of factors, including the features of the specific regulatory intervention, as well as the extent to which discretion is entrusted to the regulator (Brook & Irwin, 2003).

There are a variety of reasons why it is desirable to separate infrastructure regulation from politics. For example, as Brook and Irwin (2003) note, because infrastructure services are consumed widely and are often seen by society as essential for life functions, infrastructure

prices are inevitably tied to politics in many countries. Due to this perception regarding infrastructure's importance, political authorities are reluctant to make decisions that will be unpopular with voters, thus they are compelled to keep the price of service provision artificially low, sometimes below cost (Brook & Irwin, 2003). These types of special interests and considerations are in stark contrast with the purpose financially self-sustaining quality infrastructure provision. In order to resist these pressures it is essential to ensure that regulatory bodies enjoy some insulation from day-to-day politics.

Although it is a widely held belief in the value of the pursuit of independence and in the fact that political intervention in infrastructure can be damaging, it is important to note that independence must be viewed as a relative concept, particularly in the developing world (ADB, *et al.*, 2005). This is certainly true in East Asia, which has had a long history of strong central control. In fact in an ADB survey of East Asian regulators, less than 40 percent described themselves as even ostensibly independent (ADB, *et al.*, 2005). In many countries, notably those that do not already possess a natural separation of powers within their governmental framework, an evolutionary process towards independence has proved effective. In many of these countries the status quo regarding corruption and poor regulation has been entrenched for decades, and a lot of people possess a vested interest to ensure that it stays that way. So it's not surprising that the ADB recommends that independence for infrastructure regulators should be a process that takes time (ADB, *et al.*, 2005).

One difficulty with enhancing regulation and accountability are the wide variety of actors involved with these processes. Donors and governments of course play the largest roles as they drive infrastructure development and project implementation while controlling funds. However the role of civil society cannot be overlooked as well. As independent monitors NGOs promote transparency within the regulatory process by bolstering public knowledge and participation, the importance of which has already been discussed. While other members of civil society, particularly local and regional organizations can also monitor projects while assisting in planning and environmental assessments. If utilized, civil society can significantly augment the capacity of government regulatory agencies.

So how can a government, or outside actors, implement a process of evolutionary regulatory independence? The ADB recommends that newly established regulatory agencies be given relatively limited discretionary powers at first and that discretion should build over time (ADB, *et al.*, 2005). In this way regulators can grow into their newly granted authority, and politicians will not initially feel like theirs is being eroded too quickly. While another popular method, primarily in countries with low regulatory capacity, is that key aspects of regulation could initially be contracted out to third-party experts, like professionals from the donor agency or other nongovernmental organizations, enhancing both the quality and credibility of regulatory decisions, until a point when full decision-making responsibilities can be handed over (ADB, *et al.*, 2005). Thus under this framework NGOs have a significant role to play to ensure the transparency and independence of government regulators.

Accountability is the fourth principal of sustainable infrastructure development. It is important because allows the other aspects of infrastructure development, the planning, implementation, and monitoring phases, to function efficiently. Accountability refers to a government's ability to be responsible for the infrastructure projects being implemented within its borders. Currently, the two largest barriers to this in Lao PDR are poor governance and corruption. Decentralization and capacity building at the national, provincial, or local levels are key steps towards improving governance. While introducing competition and private sector participation can help to reduce corruption in the processes through which governments allocate infrastructure contracts and funding. As discussed in the monitoring section, regulators are an essential component in the monitoring phase of a project. However, in order to ensure that regulators are themselves are more resistant to corruption it is important to introduce greater transparency to the regulatory process, while granting regulators a fair degree of independence from the political process.

## 5.5 Sustainability Framework

The above sections provide solutions towards correcting the problems associated with each phase of infrastructure development, and are geared towards reducing the impact of projects on the natural capital stock, thus increasing their sustainability. The recommendations for change that I have provided, or that others have provided and I have reiterated, are as follows:

1. Environmental impact assessments need to be conducted for every infrastructure project and findings should influence project design
2. Alternatives for projects proposed by the EIA should be seriously considered if the impact of the original design is judged to be too high
3. Environmental valuation should be incorporated into the environmental impact assessment process
4. Said valuation must be included in a project's cost-benefit analysis, which should actually have bearing on the projects decision-making process
5. Construction contractors should employ environmentally friendly construction methods which minimize a projects impact on natural capital
6. Effective monitoring needs to ensure that the above point is followed
7. In addition to third-party monitors governments must train and equip regulators to monitor the projects within their borders
8. In order to promote good governance regarding infrastructure decentralization and capacity building at all levels of government must be implemented
9. To counter corruption transparency and competition must be introduced into the contract bidding process, while private sector participation is also essential
10. Finally, infrastructure regulators themselves must be regulated through transparency and independence from the political process

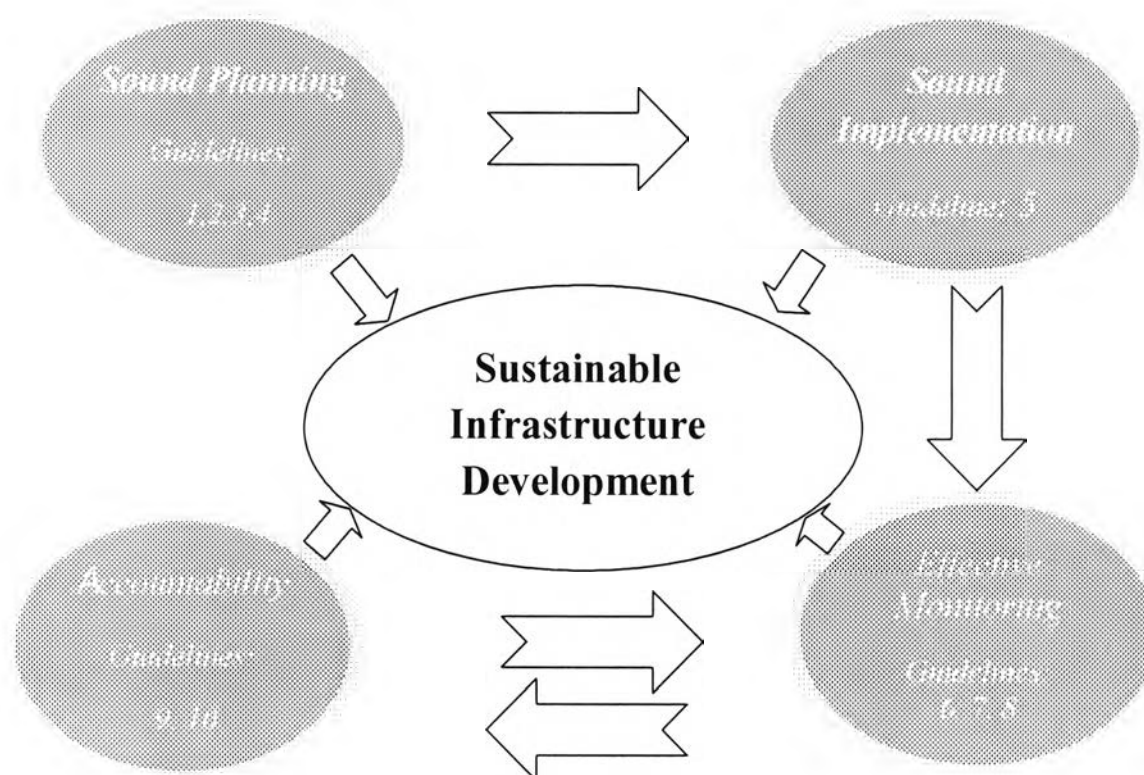
These measures, which are targeted towards governments and donors, if combined into a consistent approach will go a long ways towards providing positive and measurable change. Furthermore, although there certainly may be alternatives or additions to the measures recommended, the proposed operational framework consisting of the four key principles and the ten guidelines listed above is fairly comprehensive in that it provides multiple solutions for each

phase of infrastructure project. For a visual representation of how each guideline applies to a specific project phase please refer to Table 5.1.

<b>Sound Planning</b>	<b>Sound Implementation</b>	<b>Effective Monitoring</b>	<b>Accountability</b>
Environmental impact assessments need to be conducted for every infrastructure project and findings should influence project design	Construction contractors should employ environmentally friendly construction methods which minimize a projects impact on natural capital	Effective monitoring needs to ensure sound implementation	In order to promote good governance regarding infrastructure decentralization and capacity building at all levels of government must be implemented
Alternatives for projects proposed by the EIA should be seriously considered if the impact of the original design is judged to be too high		In addition to third-party monitors governments must train and equip regulators to monitor the projects within their borders	To counter corruption transparency and competition must be introduced into the contract bidding process, while private sector participation is also essential
Environmental valuation should be incorporated into the environmental impact assessment process			Finally, infrastructure regulators themselves must be regulated through transparency and independence from the political process
Said valuation must be included in a project's cost-benefit analysis, which should actually have bearing on the projects decision-making process			

**Table 5.1: Sustainability Framework Guidelines**

Assuming that the framework is going to be accepted and operational guidelines developed accordingly, the question arises or who is going to be responsible for its implementation. Although in many instances throughout the past chapter I have credited the unnecessarily large impact of infrastructure development on the environment to the failing of governments for their inability, or lack of desire, to monitor and control the projects taking place



**Figure 5.1: Sustainable Infrastructure Development Framework Model**

within their borders. However, this is not necessarily fair. If any change is truly going to take place it must be championed, forcefully when necessary, by the donor agencies and development banks that fund infrastructure development throughout the world. The most efficient way for them to push reform on countries that might be reluctant to change the status quo (for fear of incurring extra costs, affecting political arrangements, etc.) is to predicate funding for additional

infrastructure projects on change. Although this is already the case in several countries, the efforts by the banks to encourage reform are not sufficient. Indeed within many of these donor institutions there exists a mentality that is just focused on distributing funds: so long as an investment is deemed reliable all other considerations are secondary. In other words any investment is good investment. This status quo cannot persist.

Donor agencies have a responsibility to ensure that the money they invest is contributing to development that is sustainable. In addition to requiring that certain reforms must be undertaken before investing funds, donors must also make funds available to finance such change. For instance, generally project budgets include a flat 10% per say to finance unexpected costs, known as overhead; this same proportion of money should also be allocated to finance specific reforms associated with a given project. For example, a part of the money used to finance Highway 9 should also have been set aside to train and empower the Lao regulatory agency tasked with overseeing the project. Additionally, additional money could have been set aside to fund a more public monitoring process that incorporated local stakeholders more effectively.

In addition to funding reform donor agencies must also contribute more towards the more costly and complex environmental impact assessments that are required to properly gauge a projects impact. The measures I have recommend, including environmental valuation, cost-benefit analysis and project alternatives are not cheap, but the money must be available to ensure that they are done correctly. The funding of such measures should be included in the EIA budget, which alone is not currently sufficient to cover these costs. Currently EIA's can run up to 10% of a projects budge, however for projects that have the potential to seriously erode the natural capital stock, like road construction for instance, that proportion should be significantly increased, and should not be constrained by a donor's preference's or cost-saving models.

Thus, the responsibility for the sustainability of infrastructure development is on the shoulders of donor agencies, notably the development banks (the ADB in the case of Highway 9), because they alone hold the two tools that can guarantee reform in the infrastructure sector, both the promise of funding and the threat to withhold that same money. Low capacity is a

significant issue in several developing countries; however donors, in conjunction with civil society, should be obligated to provide funds to fund capacity build alongside infrastructure development projects. However, governments are not completely free of responsibility. They must also show a willingness to both protect their natural resources and reform their infrastructure sectors in a manner that promotes both transparency and efficiency. Donors can just provide incentives, but it is up to individual states to ensure that the infrastructure projects being implemented within their borders are truly being built for the future.