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Strategic Environmental Vulnerabilities Assessment: Framework Paper

BY PAMELA STEDMAN-EDWARDS

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Pamela Stedman-Edwards

Introduction

This paper presents a flexible analytical tool for upstream assessment of the impacts of macro-level development policies and programs on vulnerable ecosystems and vulnerable peoples. By anticipating the potential environmental impacts and related social impacts of these broad policies, we can open a dialogue with the relevant stakeholders, including the international institutions and national governments that support these policies, and develop appropriate responses to promote conservation and sustainable development in high-priority areas.

Several case studies have been carried out to develop and test this strategic environmental vulnerabilities assessment tool. These studies reviewed the probable impacts of a variety of development policies—including national development policies, World Bank Country Assistance Strategies (CAS), and Asian Development Bank projects—in Latin America, Asia and Africa. All of these policies aim to reduce poverty through economic development; some through broad economic development policies, others through projects directly targeted to specific economic sectors of varying relevancy to the poor. Economic development is essential to poverty alleviation, and these policy approaches are having many positive impacts at the national level. However, these policies may be ineffective, or even counterproductive, for the poor who are least equipped to take advantage of new opportunities and for the ecosystems that are most threatened by further disturbance. Anticipating these outcomes should allow WWF, other civil society organizations (CSOs) and community

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organizations to begin addressing the environmental and social issues early in the process of policy development and implementation.

The strategic environmental vulnerabilities assessment (SEVA) framework outlined here is intended to generate the upstream analysis essential to developing an adequate response to the likely impacts of these development policies. To ensure a focus on the most critical environmental impacts of the proposed policy, the approach uses a "vulnerability filter." Each assessment will focus on the changes related to the economic sector(s) with the greatest impacts on the most vulnerable environmental resources and on the vulnerable human populations that rely on those resources.[1] The SEVA will provide two key types of information about policy impacts on priority places:

- A geographic understanding of the impacts of the policy; that is, where will the impacts be felt?
- An understanding of how the policy will affect resources; that is, how is the policy translated from the national government or international financial institutions (IFIs) to the local level?

This process of gathering information for the SEVA and carrying out the analysis should secure the participation of communities and environmental organizations in developing a dialogue among stakeholders and policy-makers about environmental impacts, developing appropriate recommendations and initiating responses to the policy.

The next two short sections of this paper explain in greater detail the concepts underlying the SEVA. We then provide a step-by-step guide to carrying out a SEVA, illustrated with examples from the test studies. The final section reviews some of the opportunities and difficulties in using this methodology.

1 The term "environmental resources" is used here to mean both natural resources (e.g., biodiversity, forests) and environmental services (e.g., watershed protection) that are provided by those resources.

Focusing on Vulnerabilities

Development organizations have taken major steps forward in designing and implementing strategic environmental assessment (SEA) tools for broad macroeconomic and sectoral policies. SEA is a structured, upstream analysis of the impacts of proposed policies conducted before their implementation. The emphasis of SEA is usually not on *quantification* of impacts but rather on undertaking a *qualitative* assessment of likely environmental impacts of the economic activities that would be promoted by the policies or programs. SEA aims to assess direct, indirect, cumulative and multiplier effects, and to evaluate them in terms of sustainability or environmental objectives. This ensures that policies are designed and implemented with full awareness of their consequences, both positive and negative, and allows for the development of policy alternatives that enhance opportunities for sustainable development and minimize environmental damage. Requirements for SEAs are in many cases quite comprehensive and, if well implemented, will strongly support the mainstreaming of environmental issues. (See the appendix for a review of SEA policies developed by IFIs.)

Organizations such as WWF, however, need a tool for assessing the direct and indirect impacts of broad development policies on the particular habitats, species and environmental services that are the focus of our work. This tool must be much more focused than a standard SEA. The reason for this lies in the vulnerability of the ecosystems that WWF aims to protect and the vulnerability of the peoples who depend on them. By identifying these environmental **vulnerabilities** in conjunction with an upstream analysis of policies, it is possible to predict the direct and indirect impacts of development policies on critical environmental resources.

Development policies, whatever their goals in terms of poverty alleviation, almost always target specific productive sectors of the economy (e.g., extractive industries, agriculture, energy, forestry, infrastructure) for growth. This economic growth is expected to benefit the national economy as a whole. However, these sectors are generally located in specific geographic areas and make use of particular resources. Depending on the socioeconomic and environmental context, growth in these targeted sectors could have positive or negative impacts on the environment and the poor in these places.

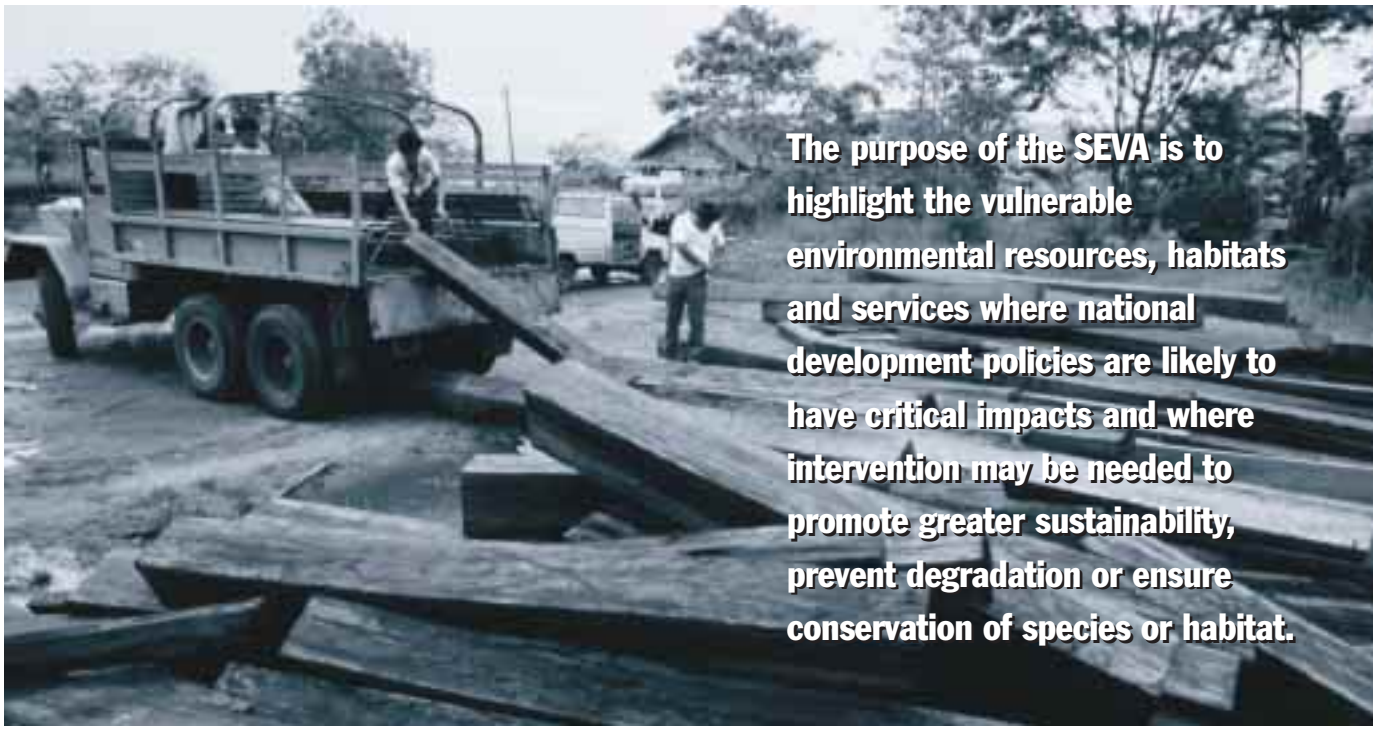
Although the broad impacts of new development policies are of great importance, the ecosystems and habitats of concern often constitute only a small part of the area that will be affected. These places are often isolated and inhabited by peoples who are both dependent on local natural resources and ill-equipped

to take advantage of new opportunities created by development policies. For these reasons, the environmental impact of a macro-level policy on these places and peoples may differ, qualitatively or quantitatively, from the national experience under the policy.

The assessment tool we offer here focuses specifically on **vulnerable places** and the **vulnerable peoples** who inhabit them. The tool is intended to help environmental CSOs and communities predict and respond appropriately to the changes in resource use—either by local peoples or others—that may be induced by development policies. It is *not* intended to replace the SEAs done by international development agencies or national governments but rather to complement those assessments with a more focused look at particular places, resources or peoples that might be missed by a broader assessment. To reflect the differences between the WWF-Macroeconomics Program Office (MPO) approach and broader SEAs, our assessment tool is called a strategic environmental vulnerabilities assessment.

Many studies of links between environmental degradation and erosion of living standards have found that these two phenomena tend to be highly concentrated in the same vulnerable ecosystems. For the purposes of the SEVA, **vulnerable ecosystems** are those that have high ecological importance (generally because of their rarity) and are either threatened or currently experiencing environmental degradation attributable to human activities. **Vulnerable populations** refers to rural poor, indigenous communities and other groups that are heavily dependent on natural resources and unable to respond dynamically to economic change. These populations frequently depend on vulnerable ecosystems for their livelihoods. Any socioeconomic change that improves the ability of these people to manage resources sustainably will have environmental benefits; any socioeconomic change that reduces their ability to manage resources sustainably will strengthen the links between impoverishment and environmental degradation.

The purpose of the SEVA is to highlight the vulnerable environmental resources, habitats and services where national development policies are likely to have critical impacts and where intervention may be needed to promote greater sustainability, prevent degradation or ensure conservation of species or habitat. This focused analysis should provide non-governmental organizations (NGOs), CSOs and communities with the information they need to engage governments, development agencies, and local and national stakeholders in efforts to address any negative impacts of the policy reform and to contribute effectively to the overall success of the policy reform.



DEFINING THE VULNERABILITIES FILTER

Vulnerability of **ecosystems** and vulnerability of **human populations** are widely defined in the same terms:

- *exposure* to stresses, perturbations and shocks;
- *sensitivity* of people, places and ecosystems to the stress or perturbation, including their capacity to anticipate and cope with stress;
- *resilience* of the exposed people, places and ecosystems refers to their capacity to absorb shocks and perturbations while maintaining function (UNEP 2004, p.5).

The Millennium Ecosystem Assessment (MEA) has adopted a "vulnerable peoples and places" approach, on which we have drawn heavily for the SEVA framework (UNEP 2004). Although the MEA recognizes the major gaps that remain in our knowledge about the vulnerability of both ecosystems and human populations, and in particular about the complex relationships between the two,[2] it rightly puts the concept of **coupled social-ecological systems** front and center. This reflects our understanding of the close links between vulnerable peoples and the environmental resources they depend on.

Vulnerable Places

The natural sciences have defined ecological vulnerability in terms of exposure to stresses, high sensitivity to change and lack of resiliency. The key factors contributing to increasing ecosystem vulnerability—that is, the key drivers of ecosystem vulnerability—are habitat loss and degradation, loss of biodiversity and climate change. Various methodologies for priority setting have been developed by conservation organizations (e.g., WWF, The Nature Conservancy, Conservation International, Birdlife International) that assign priority according to one or more environmental measures—species richness, rarity of species or ecosystem, representativeness, role in determining survival of the ecosystem assemblage, or intactness—in combination with the perceived threat from human activities (Miranda et al. 2003). Some methodologies focus primarily on biodiversity measures; others focus on ecosystem intactness. WWF is concerned with both issues: ecosystems in which high levels of biodiversity or critical habitats are extant but are under threat.[3] But the SEVA framework is not restricted to a focus on biodiversity. To address the interests of other CSOs, it could easily be expanded or reoriented to look at changes in environmental services (such as clean water) or other key relationships between economic change and the environment simply by using different criteria for identifying vulnerable areas.

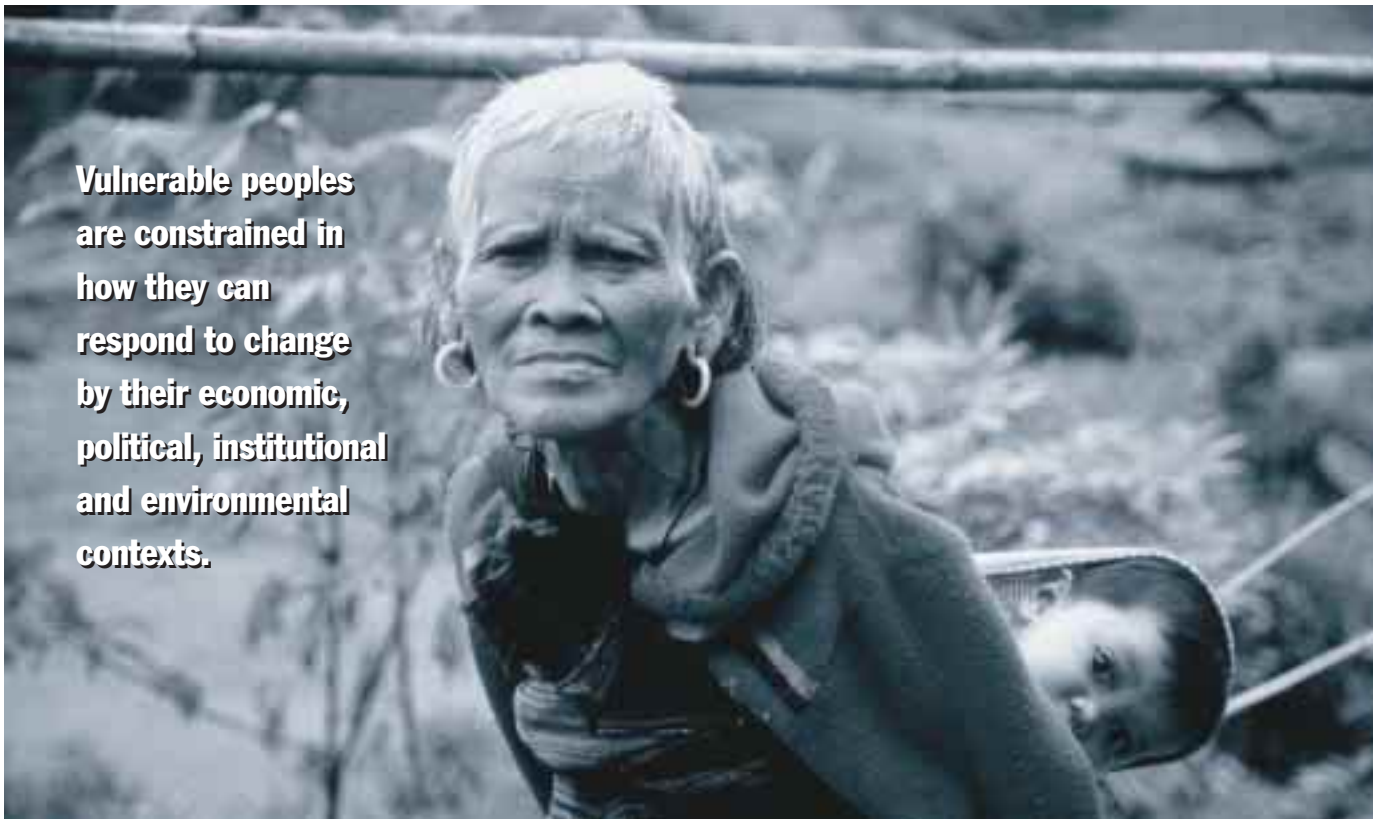
The test studies carried out to develop this SEVA framework looked primarily at WWF priority areas. WWF's ecoregional programs[4] have identified priority areas with regard to biodiversity measures, intactness and vulnerability to destruction or degradation. The ecoregional-based analysis of environmental vulnerability begins by defining areas of particular biological importance and then assessing the threats to those areas as the basis for setting conservation priorities on a regional scale. These parameters are analyzed using two indices. The first is the Biological Distinctiveness Index (BDI), which is based on species richness, endemism and measures of ecological processes and evolutionary phenomena.[5] The BDI gives weight not only to the most species-rich areas but also to ecosystems that are less rich but are distinctive and representative of highly diverse and complex regions. The second index, the Conservation Status Index (CSI), is based on several measures of intactness, including extent of remaining habitat, habitat loss and degree of fragmentation, as well as degree of protection and anticipated threats. Linked together, these two indices provide a measure of the uniqueness and the threats to an ecosystem that serves as a useful proxy for vulnerability.

2 Chapter 7 of the MEA (UNEP 2004) focuses on methods and tools for identifying and assessing vulnerability.

3 "Vulnerable ecosystems" could refer to systems in which a complete collapse of the natural system is likely. However, although these areas are of great concern to mankind, WWF focuses its work on areas where substantial biodiversity or habitats are still intact.

4 "Ecoregions" encompass distinct ecosystems that share broadly similar environmental conditions and natural communities; ecoregions are appropriate conservation units for regional-scale assessments that include biological representation as a primary goal (Wikramanayake et al. 2002).

5 Biological criteria used to determine biodiversity importance include species of special concern; species richness; important feeding, breeding or nesting sites; seasonal migrations; complete or unique habitat complexes; degree of representation; ecological processes; unique/endemic species; species assemblages or associations; intact biota (including presence of top predators); and unique physical habitats and habitat features (WWF 2001).



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Vulnerable Peoples

Human vulnerability is defined by the MEA as "the capacity to be wounded by socioeconomic and ecological change."[6] Human populations that are exposed to substantial stress, are sensitive to change and lack resiliency are vulnerable to declining quality of life because they will be unable to respond adequately to socioeconomic change. Resiliency is in many ways the opposite of vulnerability: Human populations that are resilient have a variety of viable livelihood options open to them and are less dependent on a particular set of natural resources for their livelihoods. Vulnerable peoples are constrained in how they can respond to change by their economic, political, institutional and environmental contexts.

The central focus of the MEA and other efforts to assess vulnerability is on human vulnerability to environmental change. This includes both global or broad regional change (such as climate change) and local change (such as soil erosion), both of which are often caused by human activity. A number of recent studies have focused on the close links between poverty and vulnerability to ecological change, and have made substantial advances in understanding these complex issues. These have included studies on food and livelihood security, risk of natural disasters and desertification. The SEVA should consider these aspects of the poverty-environment nexus, as well as factors that are more exclusively related to biodiversity conservation, such as habitat destruction, overharvesting of wildlife and degradation of other natural resources that are essential for ecosystem functioning. Much of this work has identified **indicators** of human vulnerability to environmental change or natural disasters that are useful at the national level.[7] Less work has been done on local indicators or indicators that describe human vulnerability to economic policy change, despite the fact that many of the changes in the use of environmental resources, including environmental services, are a result of economic and development policies.

6 A variety of definitions of vulnerability exist, but they have substantial overlap. Some are focused more on natural hazards and urban problems than the one we use here. For example, the United Nations Environmental Programme defines vulnerability according to exposure to hazard, coping capacity, population density and time (UNEP 2000). Clark and others (2000) identify human vulnerability to environmental change as a function of exposure, sensitivity and resilience (cited in Miranda et al. 2003).

7 For example, the Global Environmental Change and Human Security Project of the International Human Dimensions Programme on Global Environmental Change adopted a set of 12 indicators of vulnerability, including food import dependency ratio, water scarcity, energy imports as a percentage of consumption and access to safe water.

At the local level, poverty is usually a good indicator of human vulnerability because it reflects exposure to socioeconomic and environmental stresses, high sensitivity to change and limited resiliency. Poverty is particularly useful as a proxy for vulnerability when poverty is measured in terms of livelihoods or well-being rather than strictly in terms of income. It is now generally accepted that poverty is more than just a question of low income; poverty is a "pronounced deprivation in well-being" (World Bank 2000) resulting from a deprivation of a multifaceted set of material goods, assets, conditions and opportunities (Reed 2001).[8] Vulnerability of human populations is generally the result of a combination of negative factors that are closely related to economic poverty, including the following overlapping factors:

1. Poverty—lack of access to cash, capital, employment, education, health services and/or natural resources.
2. Limited control over resources—uncertain tenure over the resources needed to sustain livelihoods, limited political power and/or lack of voice (participation) in government or social institutions controlling access to resources.
3. Limited opportunities—resulting from isolation (geographical or social); lack of access to capital, education and/or other resources; limited diversity of livelihood sources.
4. Food/livelihood insecurity—resulting from environmental factors such as soil erosion, desertification and flooding, and from socioeconomic factors such as poverty, discrimination and/or poor market access.
5. Exposure to natural disasters—as a result of social and environmental factors.

The test studies used a variety of indicators for vulnerability, combining two or more when possible. Indicators included income levels, consumption levels, ethnicity, tenure status and the Human Development Index (HDI). The HDI takes into account life expectancy, education and standard of living, and thus brings together several measures of poverty.

The MPO's use of the SEVA is premised on the belief that ensuring sustainable livelihoods for the peoples who depend on the resources of these places is the best way to ensure that vulnerable ecosystems are protected. The vulnerable peoples who are considered in the SEVA process are those who, because of local socioecological conditions, will benefit most from sustainable development and protection of environmental resources. This is not to deny that some of the poorest, most vulnerable peoples live in places where the natural environment has been very seriously degraded, such as heavily urban areas, and where no environmental resiliency remains. However, for the purposes of the SEVA process and the test studies carried out for its development, the vulnerable places of concern are those that still have the capacity to support biodiversity and human life. The opportunities and constraints faced by the vulnerable peoples who depend on these places in adapting to economic or institutional change will affect the long-term ecological well-being on which they and the planet depend.

Mapping

Mapping is a very useful tool for identifying the coincidence of vulnerable places, vulnerable peoples and changes in resource use induced by new policies. For the purposes of flexibility and speed, a simple approach to mapping is recommended here, using the vulnerability indicators discussed above. It begins with an overlay of existing demographic data that indicates vulnerable populations with maps of existing ecosystem or environmental vulnerabilities. This data is then compared with possible policy impacts. (This process is described in more detail under Step 3 on page 14.)

Various efforts have been made to map vulnerability. Most have focused on one or two particular human dimensions of vulnerability, such as water scarcity or population growth. To a lesser extent, efforts have been made to map environmental vulnerability, including biodiversity vulnerability (Myers et al. 2000, Nelleman et al. 2001). These maps present snapshots of a limited set of threats or vulnerability indicators at a particular scale

8 According to Reed (2001), "Reducing poverty, according to this perspective, requires providing economic opportunity to the poor through development strategies that promote high-quality growth (IMF 1998), strengthening the political participation of the poor, and enhancing conditions that reduce the vulnerability of the poor (World Bank 2000). These strategies have been difficult to put into effect, however, because poverty is often also a social relationship, reflecting "competition among individuals, social groups and the state in their pursuit of wealth and political power. In this perspective, poverty results from the competitive relationship in which a significant number of people are unable to gain access to life-supporting assets, be they productive, environmental or cultural, while others secure the conditions for stable, productive lives".

and a particular time (UNEP 2004). They are less useful for depicting cumulative or long-term risk, although it would be feasible to devise such maps. It is also difficult to use these maps to link global or national scales with local environmental change that threatens the long-term resilience of human systems or ecosystems (UNEP 2004). The SEVA will attempt to do this through the selection of concrete impacts of development policies—such as infrastructure construction, mining and agricultural development—that can be mapped along with human and ecological vulnerabilities.

STRATEGIC ENVIRONMENTAL VULNERABILITIES ASSESSMENT FRAMEWORK

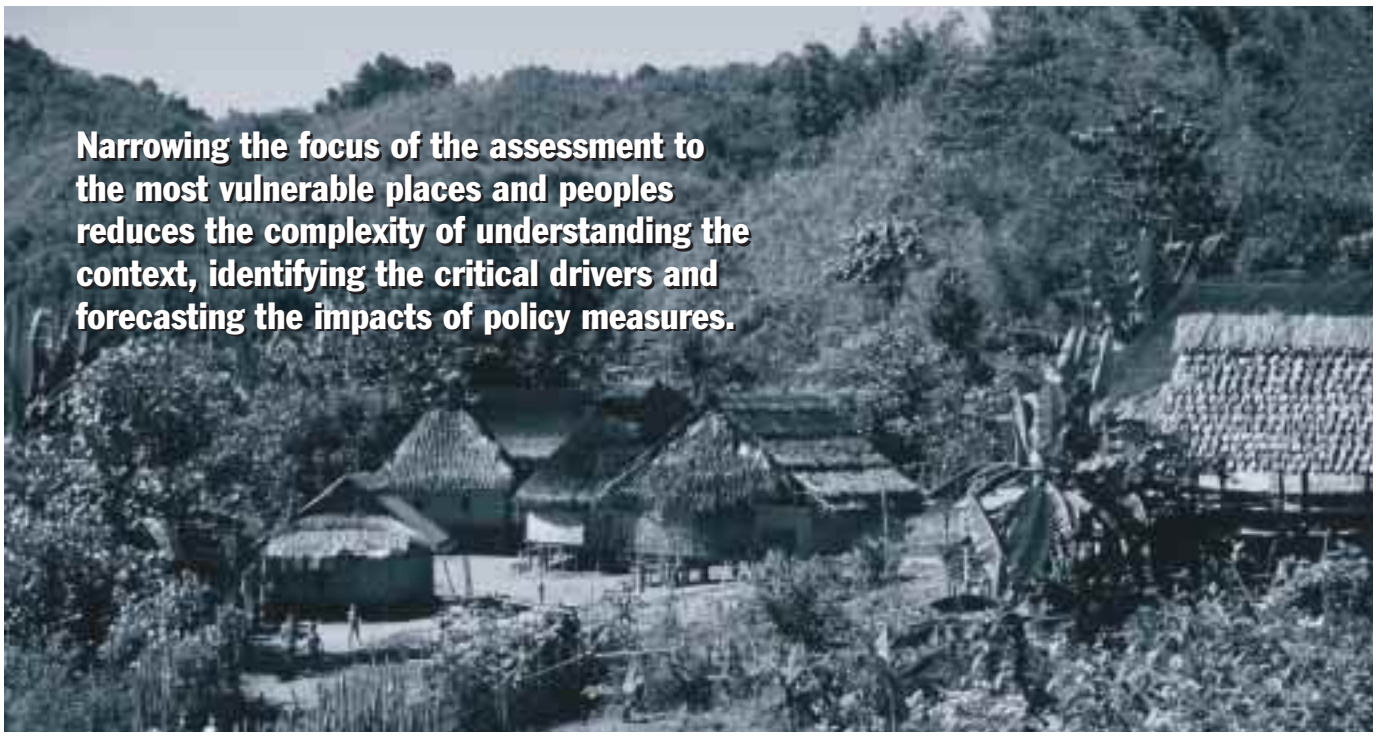
This section presents a framework for carrying out a SEVA. Because this type of assessment will need to be done rapidly, often with limited data and by CSOs with limited experience in policy analysis, we have attempted to keep the framework simple and easy to adapt to a variety of situations.

Any SEA needs to characterize the major components of the context in question, identify key drivers of environmental change and threats and forecast the environmental and related social changes that are likely to occur as a result of economic development activities. On a national scale, this requires a comprehensive analysis. Narrowing the focus of the assessment to the most vulnerable places and peoples reduces the complexity of understanding the context, identifying the critical drivers and forecasting the impacts of policy measures. This focused approach allows us to trace the *direct* effects of policies that have clear implications for the environment, such as land-tenure reforms. It also facilitates a fairly robust analysis of the *indirect*, more tenuous links with apparently distant and overarching policies, such as devaluation of the national currency or reduction of tariffs.

Five key steps are discussed here:

1. Review of proposed development policy
2. Vulnerabilities filter
3. Mapping vulnerabilities
4. Assessing the impacts
5. Developing recommendations

Each step is defined in terms of its purpose and the key conceptual questions that need to be answered. A set of intermediate questions is suggested in each step to help move the assessment team toward the answer(s) to the conceptual questions. Analytical tools are



described for several steps, and examples from the test studies are provided along the way in the sidebar.

Step 1: Review of Proposed Development Policy

Purpose: To determine whether the assessment is necessary; to determine which economic and environmental sectors need to be considered by the assessment.

The SEVA should begin as early as possible in the process of policy development to ensure that the findings can be considered in the policy design. The first task is to identify the objectives and broad categories of likely outcomes of policy implementation. For example, the objectives of a macro-level policy may include poverty alleviation, increased export capacity and expansion of modern agriculture. To achieve these objectives, governments will carry out a variety of activities that, depending on the policy objective, may include promoting physical developments (e.g., roads, ports, pipelines); changing the way businesses and markets operate (e.g., privatization, liberalization, taxation and subsidy systems); changing the institutions or regulations governing the use of economic resources (e.g., changes in mining concessions or agricultural extension programs); or any combination of these. All of these policy inducements and investments will affect the way businesses, communities and individuals use environmental resources.

To decide whether or not to carry out a SEVA, we must first determine whether achievement of the policy goals or implementation of the related activities is likely to significantly affect the environment.

The test studies looked at poverty alleviation promoted by agricultural development in Vietnam; export increases promoted by infrastructure for agricultural exports in Bolivia; export promotion through hydrocarbon development in Peru; increased commerce through road construction in Laos; improved export earnings through mining sector growth in Indonesia; and economic growth through mining promotion in the Philippines.

The conceptual questions to be answered in this step are designed to help the practitioner determine whether it would be useful to carry out a SEVA for a new policy and, if so, what economic sector(s) and what geographic area(s) it should focus on. The intermediate questions are intended to help answer the larger conceptual questions.

- The first question looks at whether there will be environmental impacts.
- The next questions look at where those impacts would occur.
- Answering the third question determines whether a SEVA should be carried out.

Conceptual question:

Is the policy likely to induce change in the economic sectors that directly or indirectly drive the use of environmental services and resources?

Intermediate questions:

What are the objectives of the policy, stated or unstated?

What changes in economic or productive behavior does the policy aim to induce?

What means (laws, regulations or activities) will the policy use to achieve those objectives?

Does the policy make specific provisions for the poor or for the environment?

What links have been identified between economic growth and the environment?

In many cases, policy or program documents will be explicit about the economic sectors that will be boosted by the change. However, the outcome of broad macroeconomic policy changes may not be so obvious. For the environment, the most important direct and indirect impacts stem from:

- changes in prices of natural resources that affect the behavior of producers and consumers, and
- changes in access to resources that allow or promote commercial exploitation or limit use by traditional users.

The study in Vietnam examines how policies intended to promote expansion of agricultural exports change agricultural production patterns in a vulnerable area that is unsuited for agricultural expansion.

Macroeconomic reforms can lead to price changes across the economy; sectoral programs also induce price changes, though in a more limited way. Macro and sectoral policies can also alter access to natural resources, either through changes in regulation or by the creation of infrastructure. Certain macro policy changes are more likely than others to drive changes in resource use. These include energy price reforms, natural resource price reforms, privatization of heavy industry and changes in exchange rates, particularly those designed for export promotion affecting natural resources. Sectoral policies—such as infrastructure expansion, land-tenure changes, agricultural growth, tourism expansion and fisheries growth—are also highly likely to induce changes in resource use. All these policies are red flags for an SEA and probably would benefit from an SEVA[9] These changes are most likely to have detrimental environmental impacts when there are policy and institutional failures that affect natural resources and the environment, including weak regulations, poor tenure systems, ineffective monitoring and enforcement, lack of funding, lack of political will and limited local participation in decision making.

Policies that should raise a red flag:

- Natural resource price reforms, including energy-sector reforms
- Privatization of heavy industry or resource extraction
- Changes in exchange rates or export policies
- Infrastructure expansion
- Land tenure changes
- Agricultural growth promotion
- Tourism expansion
- Fisheries growth promotion

Several of the test studies looked at the impact of infrastructure creation on the environment. In both Bolivia and Laos, road construction was intended to foster commerce. This construction was intended to boost use of agricultural resources.

Knowledge of the major economic trends in the country—such as the expansion of export agriculture or an increase in private investments in mining—will help define likely directions of change. The review can identify critical economic sectors based on:

- past growth and potential future growth (such as natural gas reserves, mineral deposits, agricultural potential, export potential, marketable timber);
- percentage share of gross domestic product (GDP) and exports; and
- major trends in growth, resource use and resource degradation.

The test study in Bolivia looked at the impact of transport infrastructure on the already occurring expansion of soy production. Transport will serve both to facilitate export from existing farms and to promote an ongoing increase in the acreage under soy. Deforestation and other negative environmental trends linked with existing soy production will be aggravated.

The review should consider and identify recent changes and current trends in those sectors, as well as the known environmental impacts, particularly the location of the impacts. If possible, these locations should be mapped as an input to Step 3. Consideration should also be given to the national, regional or local capacity to deal with the environmental aspects of the expected changes in resource use. Note that this first step is intended to gather preliminary information in order to

All of the studies identified a variety of institutional failures that limit the implementation of environmental laws and regulations.

9 The World Bank points to these kinds of reforms and to the institutional failures discussed below as red flags that should precipitate an environmental assessment (World Bank 2004a).

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decide whether or not to carry out an in-depth analysis. Much of the information gathered here will be revisited in greater detail in Step 3 and Step 4.

Conceptual questions:

Which economic sectors are most likely to experience policy impacts?

Which natural resources, regions or particular locations are most likely to experience policy impacts?

Does capacity exist for sustainable management of the relevant resources?

Intermediate questions:

Will the policy or price change(s) affect the supply or production of a natural resource good (e.g., timber, minerals, oil, agricultural commodities)? What regions or locations will be suppliers?

Will the policy or price change(s) affect demand for a natural resource-based good? Where, geographically, will the demand arise? Where will it decline? Where will the supply increase/decrease occur?

What are the main economic growth sectors in the country? What sectors are shrinking?

Will the policy or price change(s) support or counter existing economic and environmental trends?

Will the policy or price change(s) drive a change in the location of economic activity? Of human populations?

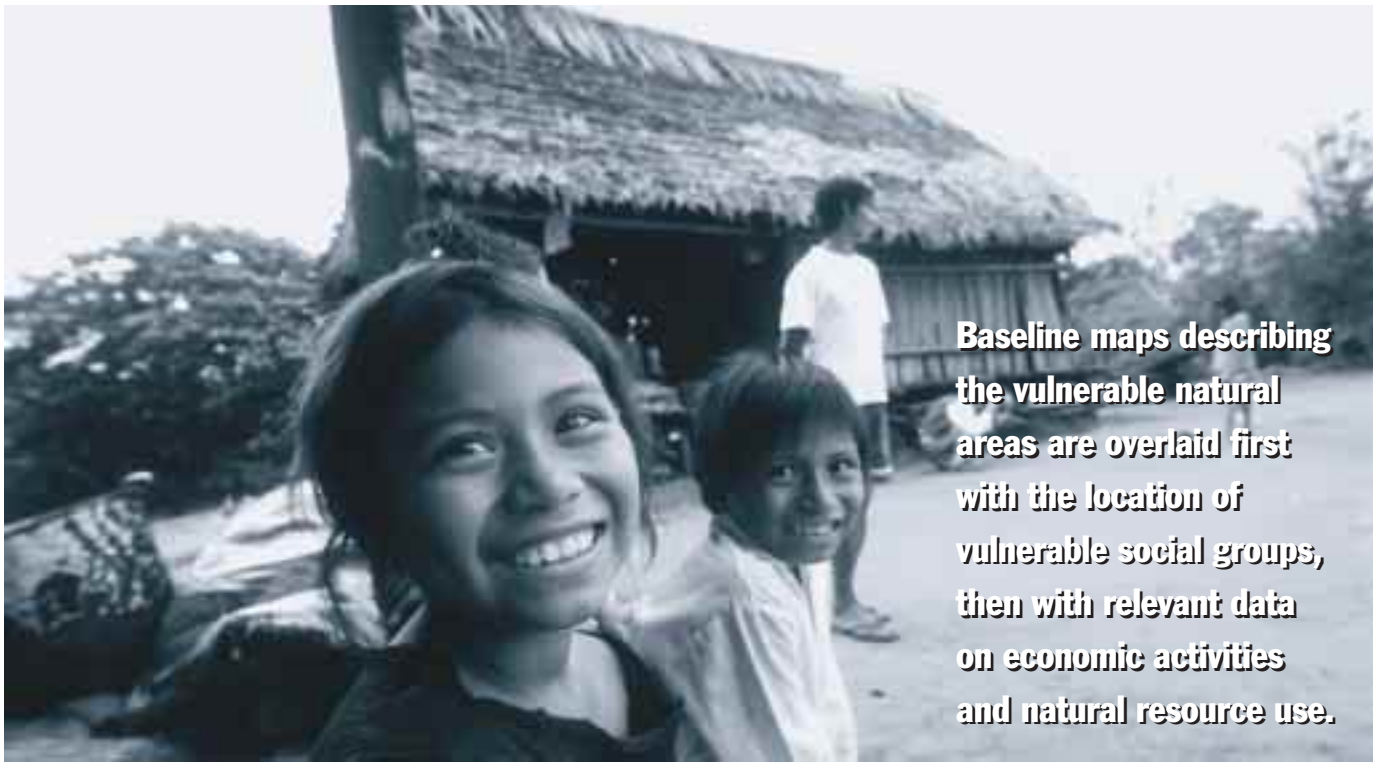
Will the policy affect areas that lack effective environmental or resource governance? Do relevant institutions have the capacity and the authority to act when environmental or sustainability problems arise?

Will policy or price change(s) foster long-term changes in productive activities?

All this information should be used to determine whether an SEVA could provide useful information and provoke a productive dialogue about development and the environment. If the impacts will be significant, and if the SEVA can contribute to understanding those impacts and to a dialogue about sustainability and the environment, it will be a worthwhile effort.

Conceptual question:

Will a SEVA provide useful information about policy impacts?



Intermediate questions:

Will patterns of resource use change significantly?

Do environmental and natural resource management institutions exist to monitor the changes and promote sustainability?

Could an SEVA increase knowledge for stakeholders and decision makers about the environmental and social consequences of the policy?

Could an SEVA contribute to better decision making regarding the policy or to measures to reduce or mitigate environmental impacts?

Step 2: Vulnerabilities Filter

Purpose: To determine which environmentally vulnerable places are likely to be affected by the policy; to determine which vulnerable peoples may be affected by or contribute to these environmental changes.

The next step is to define the most vulnerable places and peoples to look for overlap between probable policy impacts and environmental priorities. The identification of vulnerable contexts and the collection of baseline information can be based on a review of secondary information (e.g., maps, databases and analyses pertaining to the region) and discussions with local experts and communities.

A rapid survey of major ecosystems, biodiversity and ecosystem services, and areas designated as biologically important and of threats such as expanding resource use (agriculture, irrigation, forestry) will identify the vulnerable places. For WWF's purposes, the SEVA is concerned with places that are considered biologically important or valuable and are still sufficiently intact to support a wide range of species. Various methodologies exist for identifying priority areas; that is, those we should be most concerned with protecting.[10] For the test cases to develop the SEVA, we

In the Bolivia case, the area selected for the study was first identified by the national government as a priority area for inclusion in the national system of protected areas. When there were delays in this process, the local government designated it as a municipal protected area. In addition, it retains substantial forest coverage in an ecoregion considered a priority by WWF. Evidence also suggests that local communities rely heavily on non-timber forest products.

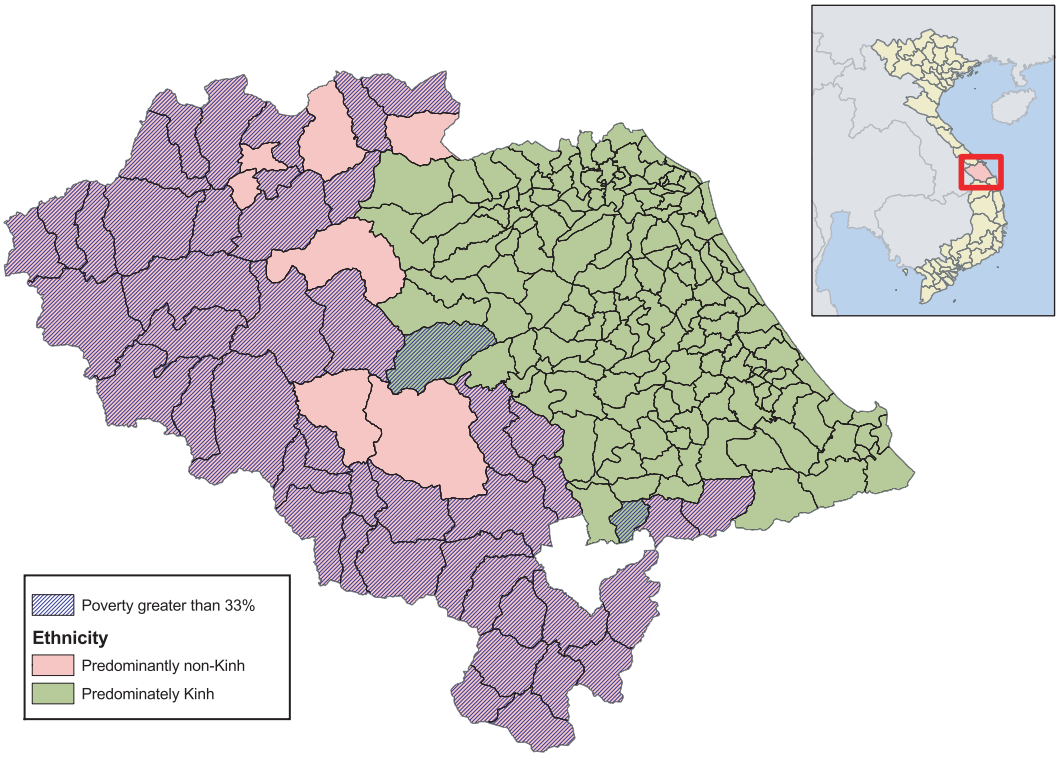
10 See the discussion under Defining the Vulnerabilities Filter: Vulnerable places.

used priority areas already identified by WWF and, in several cases, by national and local governments. We also used protected area boundaries and extant forest cover. Ideally, communities should be involved in the definition of priority areas to reflect their use of resources. For the purposes of the SEVA, protected areas, indigenous territories, and priority regions identified within ecoregions provided the most useful units of spatial analysis.

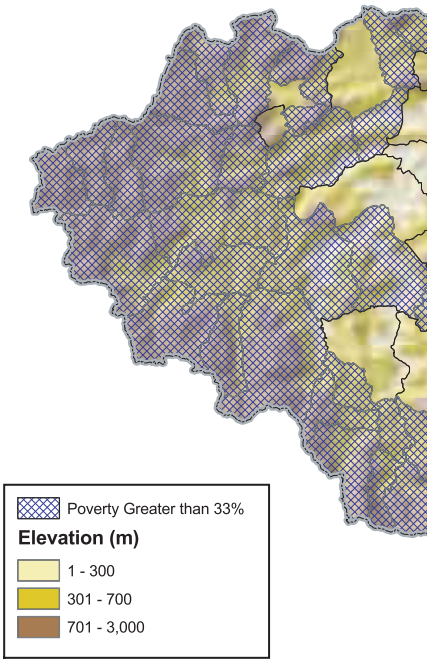
The most accessible indicators of the vulnerability of the identified regions are measures of the threats to the place. Critical threats can be measured in terms of either the environmental degradation that is occurring or the activity that is causing ecosystem loss or degradation. Threats can be measured in terms of loss of biological intactness, such as loss of critical habitat, decline of keystone species populations, localized extinctions, habitat disturbance or habitat degradation. Or they can be measured in terms of the socioeconomic drivers of environmental change: conversion of natural habitat for agriculture or mariculture, urbanization, land and water pollution and siltation, overexploitation of living resources or infrastructure construction.

Mapping both the biologically valuable places and the environmental threats is useful for analyzing vulnerability and environmental impacts. Different parts of the region are likely to face different threats, or different degrees of threat, that must be considered in determining vulnerability. For example, because the boundaries of ecosystems or ecoregions reflect biogeographic patterns, they often overlap with various political boundaries, including protected areas, indigenous areas, land-use planning units and state, provincial or municipal boundaries. These political boundaries may be of major importance in determining differences in threats and policy outcomes, and therefore in determining vulnerability. Mapping these boundaries with the biological information—such as BDI, CSI and land-use information—provides a useful analytical tool.

A parallel survey of socioeconomic data for the country—such as data on poverty levels, ethnicity and hunger, or HDI scores—will allow for the delineation of vulnerable peoples. For the purposes of the SEVA, we recommend a rapid estimate of the vulnerability of the human population based on poverty level and, to the extent possible, the related characteristics discussed above in the section on Defining the Vulnerabilities



Map 1: Poverty and Ethnicity in Quang Nam



Map 2: Indicators of Human Vul

In Vietnam, poverty maps were combined with maps of minority ethnic groups and terrain maps (to show steep, difficult-to-farm slopes) to produce a map of vulnerable peoples in the province of Quang Nam in the Central Annamites (Maps 1 and 2). These maps were available at the district level, a fairly small unit of analysis, and could be overlaid with information about infrastructure and priority environmental areas (Map 3).

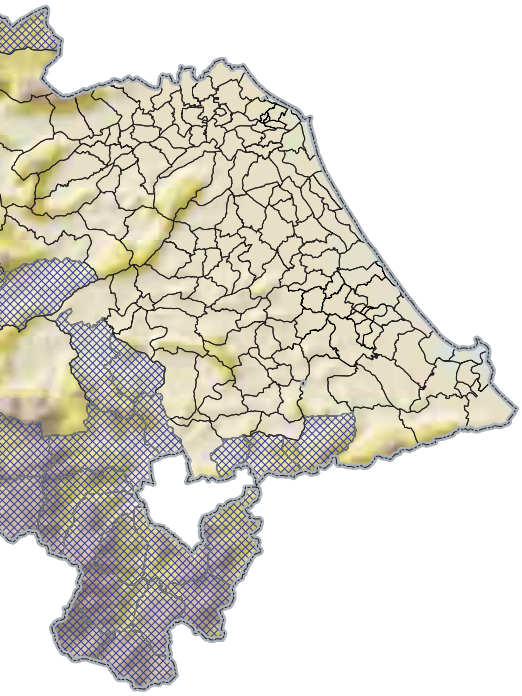
Filter. Many of the measures used will be numerical—incomes, percentage of families below the poverty line, percentage of families experiencing hunger, health and mortality statistics—but these measures indicate only one aspect of vulnerability. Some indicators, such as the HDI, provide a more comprehensive quantitative estimate of vulnerability, but these are not always available on an appropriate scale. In addition, a qualitative estimate that looks at the coincidence of the characteristics of vulnerability can be equally useful for the SEVA. For purposes of the SEVA, the degree of human vulnerability is less important than the coincidence with environmental vulnerability. The assessment (Step 4) will look at how these populations use local resources.

Overlaying maps of socioeconomic and environmental data will show where human and environmental vulnerability coincide with biological importance, which effectively identifies the most vulnerable contexts where opportunity still exists for environmental sustainability.

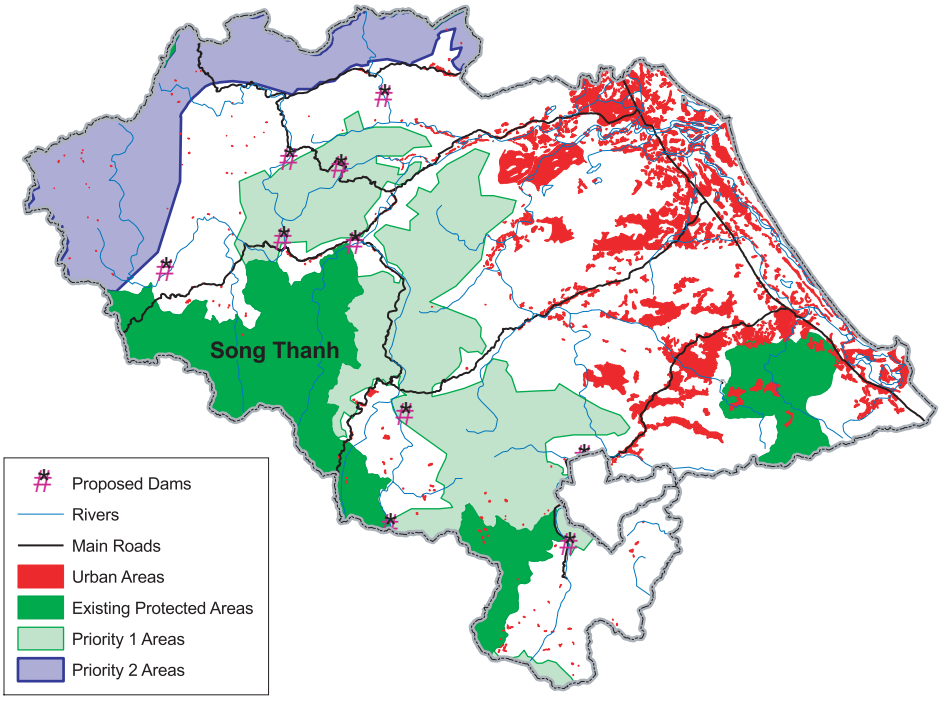
Step 3: Mapping Vulnerabilities

Purpose: To develop a map of environmental and socioeconomic data to support the identification of vulnerable contexts and to overlay probable policy impacts to further the analysis of environmental outcomes.

For the SEVA, at least three map overlays should be done, if possible. Baseline maps describing the vulnerable natural areas are overlaid first with the location of vulnerable social groups, then with relevant data on economic activities and natural resource use. Ideally, the information is plotted on a geographic information system (GIS), but often the limitations of the available data mean that maps must be much more loosely sketched. The scale of these maps should reflect not only the availability of information but, more important, the scale at which policy responses and impacts occur. As the assessment is conducted (Step 4), information



lnerability: Poverty and Elevation in Quang Nam



Map 3: Conservation Priorities in Quang Nam

about probable policy impacts will be added to this map. Examples are provided here from the Vietnam case study.

The map should identify the following:

The most vulnerable ecosystems, ecosystem services or species. In many cases, it will be possible to use existing analyses (such as the WWF analyses based on the BDI and the CSI that were used to identify the Global 200 ecoregions (cite) and in the ecoregional planning exercises to determine where resources are threatened by expanded use. Other organizations and governments have conducted similar reviews and developed similar maps that can serve the same purpose. Information about the intactness of resources (such as forest cover or protected areas) and the threats (such as encroaching roads, plantations or agricultural land) is essential. Particular consideration should be given to those resources that the poor rely on heavily, including forests, water, fisheries and agricultural land. Commercially valuable resources such as timber, mining areas and farmland that may be overexploited should also be shown on this map.

Vulnerable peoples and the natural resources they depend on. The mapping exercise should indicate areas where poor populations are likely to either (a) see their livelihoods or quality of life threatened by environmental degradation, or (b) contribute to resource exploitation and environmental degradation under the policy change. Populations can be identified on the basis of any relevant combination of the indicators discussed above. In addition to knowing where they live, it is important to consider where they are drawing natural resources from; this may include legally recognized areas—such as community forests, indigenous areas and fishing zones—or similar unofficial areas of resource tenure.

Possible changes in resource use. The vulnerabilities map should then be compared with a map identifying broad changes in economic activities likely to follow implementation of the proposed policy reform, using information generated in the initial policy review (Step 1). Emphasis should be placed on economic activities with known environmental impacts (e.g., mining, logging or agricultural expansion); changes in control over natural resources (e.g., creation of protected areas, land-tenure laws); and changes in access to resources (e.g., infrastructure). Data suit-

able for mapping includes transport corridors; forest, mining or hydrocarbon concessions; land suitable for agricultural expansion; planned changes in land tenure; and dams and other infrastructure. This map will provide an initial assessment of where the most important environmental impacts are likely to occur, and this area should be the primary focus of the assessment in Step 4. A key component of the assessment will be the reiteration of the mapping of expected changes in access to resources and patterns of resource use.

These three initial steps—review of the policy, identification of vulnerable places and peoples, and mapping—provide the background needed for the assessment stage.

Step 4: Assessing the Impacts

Purpose: To determine how the policy will affect the environment in the vulnerable place(s); to describe the role vulnerable peoples are likely to play; to estimate the significance of these impacts.

The primary purpose of the analytic process outlined here is to indicate how the policy change is likely to affect the environment, either positively or negatively, in the places (habitats, ecosystems) of environmental concern. This step comprises

1. further developing baseline knowledge,
2. identifying impacts, and
3. evaluating the significance of the identified impacts.

National policies, like other large-scale drivers of change, have different impacts in different places, depending on the socioeconomic, political, geographic and ecological conditions. The MEA states

> *Different components of the coupled social-ecological systems may have quite different vulnerabilities and experience exposure to stresses and perturbations quite differently. Diverse impacts are likely as a result; broad frameworks should not be taken as reliable guides to local conditions. (UNEP 2004, p. 16)*

Given these differences, it is critical to understand the **full context** in which the policy is implemented, the **path** of the policy impacts and the **significance** of the outcomes. The guidelines offered here are intended to help the assessment team ask pertinent questions rather than to dictate the terms of the assessment. The process described is purely qualitative. At times it is possible to include quantitative data effectively, but to ensure that these assessments can be carried out rapidly, the focus is on rapid qualitative evaluation. The following sections describe the three assessment steps, provide conceptual and intermediate questions and discuss some useful tools for each step.

Developing the baseline. Once the priority contexts have been identified, more detailed information on local or meso-level[11] environmental issues, poverty and demographic factors, governance capacity and current natural-resource-based economic activities and trends should be collected to construct a comprehensive baseline. This baseline should provide a good understanding of what would happen without the policy change and the context in which the policy will be implemented.

Improving the map. Information on poverty or other indicators of vulnerability, population density, environmental features, political or institutional boundaries (such as indigenous areas or provinces), infrastructure and economic uses of resources (e.g., mining and farming) should be mapped at a level of detail that will facilitate the analysis. Whereas too much detail can cause confusion, sufficient local information is needed to understand the unique features of the area of concern. The review should look closely at current trends in resource use and economic growth. In some cases, this new information can be added to the maps.

> In Indonesia, mining concessions that were granted in protected areas are being honored for economic, political, and legal reasons. Thus when other factors promote growth in the mining sector, these protected areas will be among those affected.

Understanding the institutional context. Relevant laws and institutions should be reviewed to understand the roles they will play in translating the policy to the local

11 The meso level may be state, province, ecoregion or another intermediate level between local and national.

level and in promoting sustainable or unsustainable resource use. The review should cover not only laws and institutional responsibilities but also institutional capacity and political will for enforcement. Depending on the particular case, a variety of institutions may need to be considered, including government institutions that regulate use of natural resources (e.g., forests, parks, mines); land-tenure institutions; agricultural extension agencies; regional institutions that regulate resource use; and community-based or local organizations that govern resource use.

The Bolivia test study found that although recent and extensive decentralization in the country showed promise of improving management of natural resources, in some cases communities were unprepared for this task and environmental management capacity did not improve.

Review of experience. Environmental impacts of recent related policy reforms and the specific pathways that link those policies and their environmental impacts should be reviewed. In many cases, this review will identify past policy changes that are similar to the current proposal. A rapid evaluation of the **pathways** or **channels** linking past policy changes to direct and indirect environmental impacts, both positive and negative, will provide a good understanding of local socioecological relationships and likely policy impacts. This review might also take into account similar situations in other regions or even other countries.

The Peru test study conducted a thorough review of the experience with design and construction of the Camisea gas pipeline in order to understand the likely impacts of further hydrocarbon development.

Predicting the likely impacts. With the baseline and vulnerabilities context established, the next step is to conduct a detailed assessment of the potential environmental impacts on the identified vulnerable places. This assessment should consider the full range of environmental impacts, including short-term and long-term, direct and indirect, and site-specific and cumulative. The key to assessing the impacts lies in considering the likely **channels** or **pathways** through which the policy

The Vietnam study reviewed impacts of an ongoing agricultural export policy that has already caused substantial agricultural impacts. Although the highlands have been largely left out of the export drive, pressure on these lands has increased as the population tries to meet subsistence needs on steeply sloping lands. Continuation of the policy is likely to cause more of the same.

package will affect local resource use and thus exert pressure on the environment. The policy may drive changes in prices, quantities of production, production methods or access to resources or markets. The pathway incorporates a chain of events shaped by political, economic, social and cultural factors that determine the likely environmental outcomes (see figure 1). Predicting the pathway and the resulting impacts of the proposed policy reform requires an understanding of the context that the baseline review provides. National-level policies may have direct impacts on local determinants of resource use, or the pathway may lead through the regional, state/provincial or local institutions that shape implementation. Figure 1 is a schematic illustration of the path of policy impacts.

Macro-scale development policies are often implemented in conjunction with other broad policies as part of a policy package. Thus, in order to present an integrated assessment of likely impacts, it is important to place the policy in the context of relevant international and national plans, regional programs, assistance from other donor initiatives, and environmental targets and standards that are being concurrently implemented, as they may influence the outcomes of the proposed reform package. This contextual understanding helps identify where cumulative impacts may arise or whether mitigation activities have already been proposed or implemented.

In many of the test cases, government efforts to expand valuable export sectors — hydrocarbons in Peru, mining in the Philippines, agriculture in Bolivia — offer the promise of improved services to vulnerable populations, but also threaten the natural resources that they depend on.

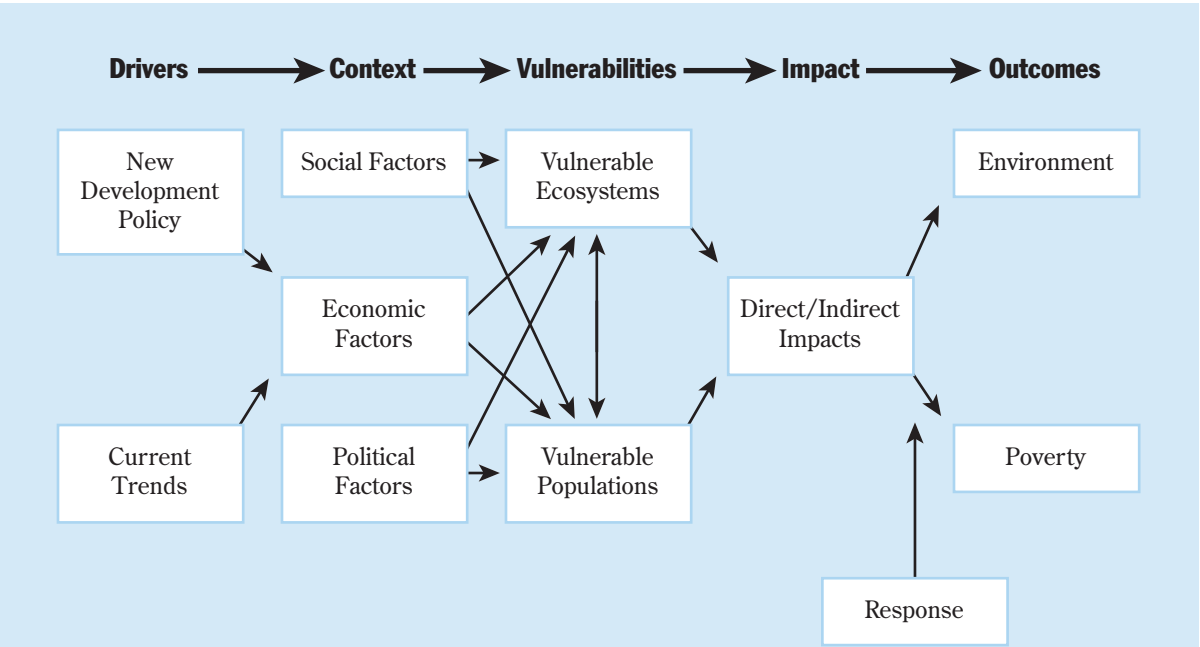


Figure 1: Model for Analyzing Impacts of Macroeconomic Policies Using a Vulnerabilities-based Approach.

Toolkit

Because of the complexity of the links among macro-level policy reform, regional context and local environmental impacts, a variety of tools may be useful in carrying out the analysis, including checklists, network diagrams and maps.

☐ ***Checklists.*** Checklists are simply lists of environmental resources that may be affected or environmental impacts that may occur. The SEVA team can review the checklist and focus on the issues that merit detailed investigation. A checklist could include such items as likely policy impacts on

- use of nonrenewable resources
- use of renewable resources
- conservation of wildlife, habitats, landscapes, protected areas
- quality of soil, water and other local environmental resources
- poverty alleviation
- local or public participation in decisions about resource use and sustainability issues
- access to information and judicial redress for affected communities

☐ ***Network diagrams.*** Network diagrams are useful to illustrate both direct and indirect links among policies and environmental impacts. Such a diagram is a "map" of the policy pathway, tracing the impacts of the policy through the economic, social and political spheres. Networks can be qualitative (descriptive) or quantitative. When impacts are identified in a diagram, the level of detail can vary. In some cases, it may be possible to give substantial detail and draw specific, quantitative conclusions about the impacts; in other cases, it may be possible only to predict the likely direction of change. Even this limited knowledge, however, can be very useful if it pertains to areas of great environmental vulnerability, where inaction could mean permanent loss.

☐ ***Maps.*** The vulnerabilities map prepared for the SEVA is a key analytic tool for determining the geographic location of environmental change, including the location of vulnerable peoples who are likely to be most affected. The map should clearly identify possible changes in resource use following implementation of a policy. Maps can be designed to illustrate various types of qualitative or quantitative data, such as agricultural production levels; logging, mining or hydrocarbon concessions; nontimber forest product reserves; land-use zoning; or infrastructure planning. It is important to be as clear as possible about the coincidence of changing resource use and areas of biological importance and vulnerable peoples. If it is accurate, such a map is a valuable tool for

- rapid evaluation of the significance of the policy change,
- development of appropriate solutions and recommendations, and
- presentation of the results to stakeholders and policymakers.

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In Bolivia's dry forests, land titling programs are falling behind the push to expand commercial agriculture, with threatens the livelihoods of communities dependent on small-scale agriculture.

In Laos, road construction, which will promote forest degradation, is in direct conflict with the government's ambitious goal of increasing forest cover to 70%.

Agricultural pressure in the highlands of Quang Nam in Vietnam threatens not only biodiversity and forests, but is causing soil erosion and degradation that directly affect the impoverished population of the region. As these conditions worsen, pressure on the forests will only increase.

Although the focus of the analysis is on vulnerable environmental resources, primary consideration must be given to the relationship between the vulnerable populations and environmental degradation or conservation. Not all—perhaps not even most—environmental damage is caused by vulnerable peoples. However, these are the peoples we must be most concerned with, because they are dependent on the availability of environmental resources and they often have little capacity (capital, access or knowledge) to develop sustainable livelihoods when they face a scarcity of these resources. Less vulnerable peoples—those who are wealthier or have greater access to resources or political power—have more options if economic, institutional or environmental conditions force a change in their livelihoods. Vulnerable peoples who are heavily reliant on environmental resources have the most to gain from sustainable management and may make reliable partners in efforts to protect the environment.

The Laos study points out that local populations rely heavily on non-timber forest products and firewood. Forest degradation will clearly worsen their situation. While community forest management experiments have been successful, they have been rare. Land tenure programs are promoting sedentarization, although the land is more suited to existing swidden agricultural patterns that allow for long fallow periods.

Conceptual question:

What will be the critical environmental impacts of the policy, particularly those pertinent to vulnerable peoples?

The assessment step is the most difficult, requiring the practitioner to determine what changes will occur when the policy is implemented. While implementation of new policies is based on a set of assumptions about their impacts, these may or may not be accurate. Even when they are in large part accurate, additional impacts may occur, or particular places or groups of peoples may experience different impacts. The conceptual questions in Step 4 are intended to promote careful thinking about the likely impacts and their significance. Answering the intermediate questions should lead to the answer to the larger, conceptual question. The tools provided here likewise should facilitate the analysis.

- The first question looks at the impacts.
- The second question asks for reflection on the relative importance of those impacts.

Intermediate questions:

What is the predicted path of impacts?

— *Describe the process/pathway by which this change will take place: price change, change in access to resources, economic change, institutional reform, infrastructure construction and so on.*

— *What will happen to the vulnerable populations? What role will they play?*

How will the policy contribute to or lessen existing trends toward environmental degradation? Will there be an increase in the use of natural resources—land, biodiversity, timber, minerals, water, fisheries, air or water pollution and so on?

How will the policy reduce or aggravate poverty in the area? Will some populations be affected more than others?

— *What mechanisms or opportunities exist for local governance of resource use?*

— *How will local people respond, particularly in terms of changes in resource use, in the short and long term?*

What mitigating factors, if any, are in place (e.g., safety nets, legal protections, protected areas, economic opportunities, agricultural extension programs, institutional brakes, industry best practices, community management systems or monitoring systems)?

What mechanisms or institutions are in place to promote or ensure sustainable use? Is there knowledge of best practices that could increase sustainability?

Are there adequate laws and enforcement to govern natural resources in the vulnerable places? Are there adequate institutions to govern natural resources?

Evaluating the significance of the predicted impacts. Estimating the likely significance of the impacts is important in deciding how to respond to the policy change. The significance of the predicted impacts can be evaluated in terms of a variety of measures: for example, magnitude of change, direction of change, reversibility, probability or risk of environmental impacts, costs versus benefits and availability of mitigation measures. Significance can also be measured against the stated environmental objectives of the national or local government or the community; against the objectives of CSOs or NGOs such as WWF; or in terms of the impact on human or environmental vulnerability. It is important to consider whether the problems and benefits identified are likely to be unique to the location or will be similar in other places. Knowing the scale of the impacts is important for developing recommendations.

Conceptual question:

How significant are the predicted environmental impacts of the policy?

Intermediate questions:

Will the change in resource use threaten the long-term sustainability of ecosystems, species, environmental services, livelihoods or commercial exploitation?

Will the policy create opportunities for improving sustainability or will it increase the threat to priority ecosystems or endangered species?

Does the policy contribute to the community's sustainable development and environmental goals or make them more difficult to achieve? Does it increase community control over resources?

Does the policy contribute to the country's stated sustainable development and environmental goals or does it run counter to those goals?

Will the policy contribute to poverty alleviation, particularly among the most vulnerable populations? Will it do so in a way that promotes sustainability?

This matrix for evaluating predicted impacts of agricultural development policies is an illustration of the matrices described in the Toolkit on page 22.

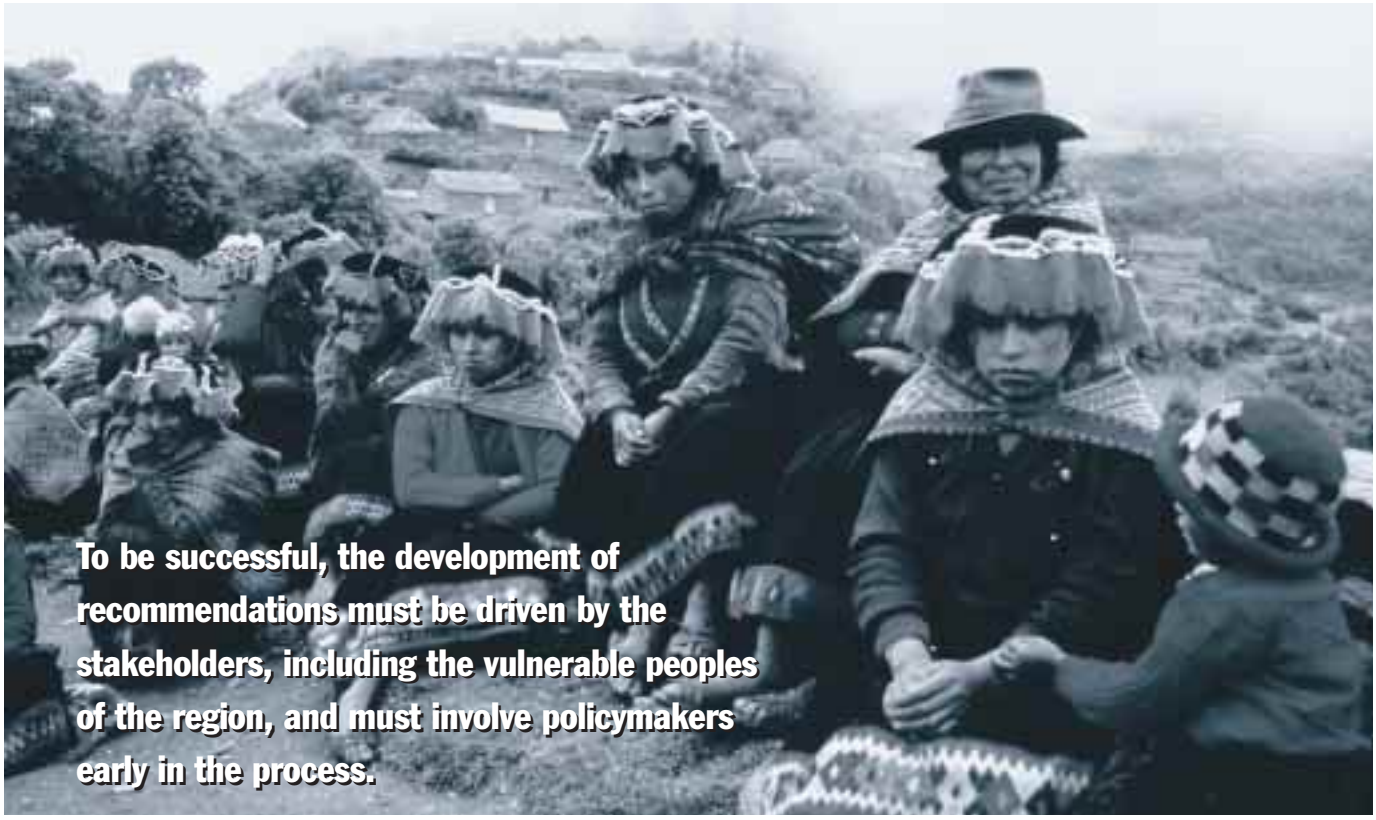
Figure 2.
Evaluating the Impacts of Agricultural Development Policies on Vulnerability in Quang Nam, Vietnam

Major agricultural trend promoted by government policies	Implication for vulnerable peoples			Implication for environment		
	Type of impact	Level of pro-poor	Scale	Type of impact	Level	Scale
Paddy rice expansion and intensification	– Positively contribute to food security of the poor; however, the scale is small – Mixed between poor and non-poor	++	S	– Negative on water – Increased soil erosion (when converting land) – Increased pesticide and chemical use for new crops	++	S
Cash crop promotion (maize, cassava)	– Little contribution or may even destabilize food security of extremely poor	+	M	– Negative on forest, land and water – Increased soil erosion if large plantations are established – Increased pesticide use	+++	M
Large-scale agricultural production	– Little contribution to livelihoods of the extremely poor	+	M	– Negative on land – Increased soil erosion	+++	S
Irrigation development	– Indirectly contribute to food security	++	S	– Negative on forest and water – Level of impacts on forest and land is subject to the size of dams	+	S
Extension service	– Short-term contribution to food security	+	L	– Negative on land and water – Promotion of high-yield varieties could lead to more soil erosion	+++	L
Forestry	– Positive but constrained by current policy on forestry	++	S	– Positive on forest – Would require policy changes to succeed	++	S

In terms of level of pro-poor: (directly solve a problem faced by the poor, reduced vulnerability, food security)
+++ pro-poor
++ mixed result
+ unsure/not pro-poor

In terms of level of environmental implication:
+++ high
++ medium
+ low

In terms of scale of the implication:
L large scale
M medium scale
S small scale



Or will it aggravate poverty or unsustainable resource use?

Have alternatives been considered that might be more sustainable and pose less significant risks for the environment?

What are the risks of unexpected outcomes?

Toolkit

☐ ***Matrices.*** The significance of the predicted impacts can be evaluated using matrices. In a matrix, the impacts of each proposed policy measure can be matched against a set of sustainability/development objectives or against the status quo, to evaluate the significance of potential impacts. Matrices can be qualitative or quantitative. They are flexible and can be refined and modified as more information becomes available. Information can be provided in various ways in a matrix: short descriptions; symbols (ticks, crosses and questions marks to represent various impacts); or qualitative or numerical information that can be used to measure environmental impacts and weigh costs and benefits. The example in figure 2 is from the Vietnam test study. The table illustrates the impact of the policies in terms of human and environmental vulnerability and in terms of the status quo.

Step 5: Developing Recommendations

Understanding the **geography** of the impacts, the **pathways** of change and the environmental **significance** of the policy change provides the information needed to develop recommendations. To be successful, the development of recommendations must be driven by the stakeholders, including the vulnerable peoples of the region, and must involve policymakers early in the process. The SEVA team can promote this consultative process by making some preliminary recommendations. These preliminary recommendations should be tailored to the specific conditions of each country—including socioeconomic conditions, environmental assets and national environmental and development objectives—and to local conditions and priorities.

The assessment may recommend a variety of measures, such as support for best practices, technology choices, fiscal measures, regulatory changes, infrastructure planning, payment for environmental services, resolution of tenure issues, development of community-based management options and support for protected areas. If the overall impacts of proposed policies are expected to be positive, recommendations

will focus on strengthening or ensuring that positive impact. If negative impacts are likely, the assessment will identify alternative development policies or supplemental policies or programs to ensure that poverty and sustainability objectives are met.

The large scale of these development policies does not require a new set of tools to resolve the problems; however, it is important to determine the scale of the problem and at what level (local, regional, national) it needs to be addressed. If the evaluation has found that the problems will be specific to the vulnerable area, solutions should be developed that target this area. However, even if the problem is manifested locally, the solution will often need to be implemented where the problem originates—which could be at the national, regional or local level. If the impacts are not specific to the vulnerable area(s) considered by the study but are likely to be more widespread, a broader solution should be sought at the regional or national level. The analysis of the pathway or channel of change is a critical input here.

In designing the recommendations and initiating a discussion or advocacy process, we need to focus clearly on the ecosystem values we are trying to protect, how we can ensure that vulnerable peoples will benefit from conservation and how we can avoid environmental degradation without sacrificing the benefits of the development policy. At the same time, we must carefully consider the audience for the recommendations. Whereas environmental organizations may have one set of objectives, different stakeholders will have a variety of objectives, among which conservation and sustainability may have little standing. And policymakers will not want to jeopardize national policy objectives for the sake of local conservation goals. A well-conducted SEVA and wide debate on its recommendations can make a major contribution to resolving these differences by clarifying the trade-offs and the realistic options.

In Vietnam, economic growth policies are driving a major drop in poverty levels. However, the local impacts in the Quang Nam highlands are not positive. Recommendations therefore focus not on changing the overall policy but on considering a different strategy for the steep slopes of Quang Nam, one that makes sustainable use of the forests the center of the poverty alleviation effort.

In Laos, where the road-building program threatens the existing forests, solutions must take into account the reliance of local people on non-timber forest products and traditional swidden agriculture. The importance of resolving land tenure issues in a way that does not compromise traditionally sustainable use, and of promoting community forest and resource management rather than centralized controls, are raised by the recommendations.

Conceptual question:

What adaptations could be made to ensure environmental sustainability while maintaining the benefits of the new policy?

Intermediate questions:

What recommendations can be made to capitalize on the environmental benefits of the policy for the most vulnerable places and resources?

If negative impacts exist, at what level should they be addressed: local, regional or national?

What recommendations can be made to reduce the negative environmental impacts of the policy for the most vulnerable places, resources and peoples?

What can environmental NGOs, other CSOs and communities do to ensure a positive outcome?

What further research or analysis should be done before proceeding with the policy?

What places, peoples or sectors need to be carefully monitored during implementation?

In designing the recommendations and initiating a discussion or advocacy process, we need to focus clearly on the ecosystem values we are trying to protect, how we can ensure that vulnerable peoples will benefit from conservation and how we can avoid environmental degradation without sacrificing the benefits of the development policy.

The conceptual question for Step 5, and the intermediate questions that will help with developing the answers, is asking "What recommendations could be made?"

Stakeholders, including local communities, are best placed to develop viable recommendations if they have been involved throughout the SEVA. They can determine the roles different groups can play in developing appropriate responses, advocacy, participation, implementation and monitoring. Well-designed recommendations can foment productive discussion among stakeholders and policymakers; they also promote advocacy and alliance building and increase management capacity for natural resources and ecosystems. Stakeholders should be closely involved in the development of monitoring tools.

Monitoring. The recommendations should highlight gaps in data and monitoring systems, and should suggest **indicators** that could be monitored to track the impact of the policy. Monitoring is essential to evaluate the actual impact of the policy and of any mitigating programs, the speed with which change is occurring, and the capacity of both people and the environment to adapt.

Indicators are measures chosen to reflect important aspects of changes taking place in a particular place. They are a condensed measure of a much larger socioenvironmental dynamic. To track the impact of national development policies on vulnerable places, the indicators should be organized along the pathway of policy impact identified by the SEVA. Indicators for long-term monitoring should include environmental status indicators such as resource quantity and quality indictors (e.g., forest cover) and rates of resource use, degradation or improvement (e.g., logging rates, changes in land cover). The indicators also should capture the evolving relationship between the vulnerable peoples and the environmental resources. This relationship can be understood through:

- demographic factors (e.g., population growth, poverty rates, unemployment rates);
- access to resources (e.g., per capita availability of resources, difficulty of collecting resources, percentage of income used for environmental resources); and
- level of vulnerability, including exposure to and impact of natural disasters (e.g., incidence of flood or drought) and declining or improving environmental quality that directly affects quality of life (e.g., incidence of environment-related diseases).[12]

The appropriate indicators must be determined for each case on the basis of the environmental resources of concern, local use of environmental resources and expected policy impacts. The indicators should be designed to be useful to both policymakers and vulnerable peoples. To the extent possible, relevant stakeholders should participate in the design and implementation of a monitoring program to ensure that the indicators track not only the factors of greatest concern to environmental organizations but also factors of concern to local resource users.

LESSONS LEARNED AND NEXT STEPS

The test case studies carried out for the development of this assessment framework contributed substantially to the design of the methodology. They were initiated before the methodology was fully drafted and took a variety of approaches, some of which were more productive than others. We drew upon this experience in designing the SEVA framework. Some of the positive results and the problems revealed by the test case studies are discussed below.

On the positive side, the vulnerabilities filter was a useful tool for identifying the coincidence of some of the most vulnerable peoples and places and for pinpointing areas where policy impacts could run counter to policy objectives or environmental objectives. Although availability of GIS data was limited, existing maps were usually sufficient to present a strong geographic picture of policy impacts. The pathway analysis was useful for identifying both the positive and negative impacts of policies and for identifying the places and peoples that would benefit and

12 For a more complete discussion of the role of indicators, see Reed and Tharakan 2004.

those that would pay the costs of economic change. Several of the studies produced maps and matrices that gave a clear picture of the costs and benefits of particular development policies or projects.

However, the SEVA is limited by the short time frame in which it usually must be conducted, by the constraints on both environmental and social data, and by the complexity involved in understanding and predicting the relationship between people and environmental resources. The test studies looked at broad macroeconomic policies (such as promotion of exports) and at large development projects (such as road construction). In both cases, the socioeconomic and environmental situations were very complex. Although direct environmental impacts were relatively easy to identify, the complex relationship between poor people and the environment was more difficult to understand and predict. All the studies would have benefited from greater understanding of the local relationship between people and environmental resources. Several of the studies looked at policies/projects that are already under way. Although it is useful to understand the impacts of these projects, it was too late to propose substantial changes.

We have learned several lessons from this experience. First, to be effective, the analysis should begin very early in the process of policy development; however, this requires governments to provide information early on in the process and that CSOs take a very proactive approach to participating in policy development. Second, the analysis requires intelligent use of existing data and careful selection of additional data to be collected, as time limits will prevent extensive data collection. Third, the analysis requires the participation of people who have a very good understanding not only of the impacts of national policy decisions but also of how people in particular places are likely to respond to changing opportunities and limits.

Although several of the test studies benefited from local data collection, none was able to involve the local community in the process of data collection, analysis or development of recommendations. The importance of involving these communities cannot be overstated—it is essential for fully understanding the current situation in these vulnerable places, for accurately predicting likely responses, and for developing recommendations that will be locally beneficial and widely accepted.

Likewise, it is desirable to engage policymakers, in regional and national governments and international development agencies, early in the process. This will encourage an open dialogue and exchange of information rather than an antagonistic approach. The SEVA should be complementary to other SEA work and should aim to promote policy benefits while preventing degradation of the most biologically important places in the world.

MPO considers this methodology a work in progress. The framework was developed as the test studies were carried out and has benefited greatly from the lessons derived from these studies. However, we hope to improve upon it as we refine these studies and carry out additional ones. Any and all comments are welcome.

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APPENDIX: INTERNATIONAL FINANCIAL INSTITUTION POLICIES ON SEAS

This appendix briefly reviews the positions of the Asian Development Bank (ADB), Inter-American Development Bank (IADB) and World Bank on strategic environmental assessment (SEA) and country environmental analysis (CEA). The general definition of SEA is similar across all three institutions and, to varying degrees, SEAs are mandated by the social and environmental policies of these institutions.

ADB

The ADB's environmental policy (ADB 2005) seeks to integrate environmental considerations into operations through "systematic application of procedures for (i) environmental analysis for country strategy and programming; (ii) environmental assessment of project loans, program loans, sector loans, loans involving financial intermediaries and private sector loans; (iii) monitoring and evaluation of compliance with environmental requirements of loans; and (iv) implementation procedures for environmentally responsible procurement" (ADB 2005).

The CEA is a tool for preparation of "upstream sector road maps and thematic analyses" that would feed into the country strategy and program. The policy specifically requires CEAs for ADB operations.

SEAs are defined by the ADB as "assessments of policies, plans and programs." The ADB (2005) identifies the following types of SEAs:

(i) "Policy impact assessment" or "policy EIA [environmental impact assessment]"— the assessment of policies being planned, proposed or already in place.

(ii) "Sectoral environmental assessment"—"the process of examining potential environmental and social implications of all or most of the potential projects proposed for the same sector."

(iii) "Area-wide or regional assessment"—assessments for policies, plans and programs related to particular jurisdictions (e.g., land-use plans for cities) or natural areas (e.g., river basin development plans).

(iv) "Programmatic" environmental impact statements—a term used primarily in the United States to refer to assessments prepared for federal and state plans and programs, such as land-use plans and herbicide spraying programs.

SEAs are not specifically required but are defined in terms of assessments of project, program, sector and financial intermediary loans.

IADB

The IADB is currently revising its environmental policy. The Draft Environment and Safeguards Compliance Policy (2005) states

> *"Bank operations whose environmental impacts cannot be identified ex-ante as part of the screening process, such as policy-based loans…require alternative analytical tools to determine their level of safeguard risks and requirements for environmental management."*

Policy-based loans that may have significant direct impacts on environmentally sensitive sectors such as forestry, energy, transportation, agriculture, mining, water and natural resources will be required to carry out, as appropriate, sector-level analytical assessments to determine policy and institutional enabling conditions needed to promote long-term social and environmental sustainability. The Draft Policy states

> *"Preparation of environmental assessments (EAs) and associated management plans and their implementation are the responsibility of the borrower. The bank will require compliance with specified standards for environmental impact assessments (EIAs), strategic environmental assessments (SEAs) and environmental and social management plans (ESMPs), as defined in this policy and detailed in the Implementation Handbook approved by Management."* (This handbook was not available at the time of writing.)

Category A operations (defined as "high" safeguard risk) require an EIA in the case of investment operations or an SEA in the case of programs and other financial operations that involve plans and policies. An EIA or SEA is also required for highly complex opera-

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tions or those that may pose significant human safety risks and potentially sensitive environmental or associated social concerns.

Category B operations (those with "moderate" safeguard risks) require an EA focusing on specific identified issues and an action plan presenting specific environmental provisions that are reported in an ESMP.

- The SEA process must include the following steps: understanding the nature of the proposed programs, plans or policies; defining the overall context within which the assessment is to be carried out, agreeing on its objectives and designing an adequate process; defining a participatory approach for effective public and institutional involvement; scoping major associated strategic environmental issues and alternatives; assessing environmental, social and economic outcomes and benefits; and establishing priorities for action.
- The ESMP must include a presentation of the key direct and indirect impacts and risks of the proposed project; the proposed social/environmental measures to avoid, minimize and mitigate the key direct and indirect impacts and risks; the institutional responsibilities to implement these measures; the schedule and budget allocated for the implementation and management of such measures; the consultation or participation program agreed upon for the project; and the framework for monitoring social and environmental impacts and risks throughout the execution of the project, including clearly defined indicators, monitoring schedules, responsibilities and costs. The ESMP should be reviewed during the analysis mission for the operations, and its management plan should be prepared to the satisfaction of the Bank prior to loan approval.

In addition to these requirements, country strategies will "incorporate, as applicable, verifiable indicators to track country-level environmental performance."

World Bank

The World Bank SEA approach originated in 1993 with guidance notes on sectoral environmental assessments that complemented project-specific EIAs. In 1996, the World Bank developed a regional environmental assessment tool to help design investment strategies as well as programs and projects for entire regions. There is currently no formal guidance for the use of SEAs.

The World Bank has developed a toolkit to analyze the links between development policy operations and the environment; the toolkit includes both quantitative and qualitative analysis. Current requirements (World Bank 2004a) for development policy lending are limited to:

- Carry out due diligence in "determining the likelihood of significant effects" on the environment and natural resources;
- Assess country systems to determine whether there is appropriate environmental management capacity to handle potential effects; and
- Recommend actions within or outside operation, with emphasis on building required institutional capacity.

The World Bank has increased its emphasis on country and sector analytical work on the environment. However, these tools are relatively new, and the Bank is still developing, refining and integrating them into policy lending operations.

The CEA is a country-level diagnostic tool designed to "enhance the World Bank's knowledge of the environmental aspects of client countries' development and their environmental management framework, capacity and performance." It focuses on the major environmental and natural resource issues in a country, reviews the policy and institutional framework, assesses institutional capacity to implement the framework and makes recommendations for priority reforms. This analysis is usually conducted at the national level or, in large countries such as India, at the state level. The CEA is a relatively new approach. To date, five full CEAs have been delivered to clients (World Bank 2004b).

SEA is currently being tested as part of a directed learning program, with some 25 examples of application in the World Bank's work to date. SEA looks at the policy and institutional framework for dealing with environmental issues within the sector and assesses institutional capacity. It may make recommendations for reforms of policies or institutions (World Bank 2004b).

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