

Poverty and the Environment A Role for UNEP

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**Concept Paper written for UNEP¹
in preparation of
Guidelines on Poverty and the Environment**

October 2001

¹ This concept paper was commissioned by the Division of Policy Development and Law, United Nations Environment Programme, Nairobi, Kenya.

In India, poor and low scheduled caste women were perceived to be at the forefront of social justice movements. It was argued that particularly in rural areas environmental issues provide an entry point for the poor to contest their rights and entitlements. Issues contested include access to land, and common property resources, equitable distribution of water sources and irrigation channels.

Source: Voices of the poor: Poverty in People's Perceptions 1999:9

Poverty and the Environment: A Role for UNEP

1. Introduction

The Malmo Ministerial Declaration was adopted by UNEP's Global Ministerial Environmental Forum in May 2000. The declaration noted that the World Summit on Sustainable Development (WSSD) in 2002 should address the two major challenges to sustainable development: (1) the pervasive effects of the burden of poverty on at least half of humanity; and (2) the excessive and wasteful consumption and inefficient resource use that perpetuates the vicious cycle of environmental degradation and increasing poverty.

Since the Malmo Declaration, the following major initiatives have taken place:

- In September 2000, 146 heads of state pledged in the United Nations Millennium Declaration to spare no effort to free all of humanity—and, above all, future generations—from the threat of living on a planet irredeemably spoiled by human activities and whose resources would no longer be sufficient to meet their needs.
- In February 2001, the Governing Council Decision 21/15 requested that UNEP undertake an analysis of the poverty-environment nexus and advise governments from developing countries on how to better incorporate key environmental sectors in their poverty reduction strategies.

These initiatives come at a very appropriate time as it becomes increasingly clear that current patterns of economic development have led to: (1) degradation of the environment and a reduction in the quantity and quality of natural resources; and (2) very uneven results in terms of wealth creation, with increased disparities within and between nations. It is a situation that, barring major policy shifts, is quite likely to get worse and to be particularly difficult for poor countries facing convergent economic and environmental crises. More needs to be done and UNEP has a role to play in meeting this challenge.

The Malmo Ministerial Declarations, the United Nations Millennium declarations and the Governing Council Decisions 21/15 have given a clear mandate for UNEP to advise governments—especially in the less developed and the highly indebted countries—on ways and means to incorporate environmental considerations within the context of Poverty Reduction Strategy Papers (PRSPs), Country Assistance Strategies (CAS) and national development plans. This role is especially important as the momentum for the development of the Poverty Reduction Strategy Papers (PRSPs) increases and is beginning to be accepted as the standard for international aid.

The World Bank, a primary architect of the PRSPs, has produced a guidebook for policy-makers in developing countries to use when formulating their respective PRSPs. There is a chapter on the environment that provides valuable information on integrating environmental concerns into poverty reduction strategies. However, the contents and strategies in the chapter focus only on one dimension of environmental resources—the exchange of commodity properties or environmental resources. There is very little guidance on how to develop environmental plans to address the critical life-supporting property of

environmental systems—the non-commodity space. And this is a vital role that should be addressed—especially in the context of the poverty reduction strategies—due to the dependency the poor have on these resources to meet their elementary functionings² to increase their capability³ space (Duraiappah 1998).

This concept paper proceeds as follows:

In the next section, a brief overview of the strengths and weaknesses of the two main initiatives in the field of poverty and the environment will be provided.

In the third section, we will provide a conceptual framework that UNEP can adopt to address the poverty-environment nexus. The framework will build on the strengths of existing frameworks while addressing some key concerns not addressed by current initiatives.

In the fourth section, we shall present the methodology to operationalize the conceptual framework presented in the previous section.

The fifth section presents a road map that provides a step-by-step guide on transforming the conceptual framework into a set of operational guidelines.

In the sixth and final section of the paper, we shall provide an overview of the main arguments presented in the paper.

2. Identifying the Gaps: Strengths and Weaknesses of the Current Poverty-Environment Initiatives

It is imperative to first investigate current poverty-environment initiatives before we can explore the potential role UNEP can play in the poverty-environment nexus. This is to prevent duplication or “re-inventing the wheel” and, more importantly, to not confuse policy-makers in developing countries with another initiative that may complicate the issue.

There are two major initiatives underway. The first is the World Bank’s Environment Strategy and the second is the Poverty-Environment Initiative, a joint collaborative effort between the United Nations Development Program and the European Union. In this paper, we explore the fundamental ideological thoughts underlying these two initiatives and explore if more needs to be done.

We begin with the World Bank Environment Strategy (WBES). The WBES acknowledges the important role the environment plays in poverty alleviation through three channels. The first thrust of the initiative is based on improving the **quality of life** by:

² Elementary functionings are different from basic needs or primary goods in that they refer to “beings” or “doings.” There is a more detailed explanation in the later part of the paper.

³ The term “capability space” used in this paper refers to the concept as presented by Nobel Laureate Amartya Sen. We shall discuss it in detail later in the paper.

- Improving people's health by reducing their exposure to environmental factors such as indoor and urban air pollution, water-borne and vector-borne diseases and toxic substances;
- Enhancing the livelihoods of the poor people who depend on land, water, forests and biodiversity by helping them secure access to these assets and creating circumstances in which they can manage those resources sustainably; and
- Reducing poor people's vulnerability to environmental risks such as natural disasters, severe weather fluctuations and the impacts of climate change by getting information to poor communities and empowering them to adapt.

The second thrust relies on improving the **quality of growth** by:

- Improving the policy, regulatory and institutional frameworks for sustainable environmental management; and
- Supporting environmentally and socially sustainable private sector development.

The main premise underlying this component is that market and policy failures have been the primary causes for the inefficient use and inequitable distribution of environmental resources. The recommendation is directed at correcting these institutional failures and ensuring that the "right" prices are used.

The third thrust lies in protecting the **quality of the regional and global commons** by:

- Focusing on the positive linkages between poverty reduction and environmental protection;
- Focusing first on local environmental benefits, and building overlaps with regional and global benefits;
- Addressing the vulnerability and adaptation needs of developing countries;
- Facilitating transfer of financial resources to meet costs of generating global environmental benefits not matched by national benefits; and
- Stimulate markets for global environmental public goods.

The ideology behind this objective is to address global common issues like climate change through local initiatives that provide immediate benefits to the impoverished. In this way, a double dividend is achieved: damage to a global common is reduced while poverty is alleviated at the local level.

The WBES is definitely a step in the right direction. The framework acknowledges the high degree of dependency the poor have on the environment and therefore recommends various environmental initiatives that benefit the poor. How different is this framework from past realities? The main contention here is that, in the past, the poor were marginalized in their access to and use of ecological systems. This new initiative, therefore, attempts to correct this deficiency by establishing various mechanisms that will allow easier access to ecological systems by the poor. The strategy implicitly assumes that ecological systems are commodities

that should be used in the most efficient manner by the poor to increase income-generating potential. The approach depends on using the market to provide the necessary mechanisms to promote efficient and sustainable use of environmental resources.

We now turn our attention to the UNDP-EU Poverty Environment Initiative (PEI). The UNDP uses the sustainable livelihoods framework to reduce poverty. There has been a proliferation of sustainable livelihood models by a variety of different organizations and as Carswell et al. (1997) point out: “definitions of sustainable livelihoods are often unclear, inconsistent and relatively narrow.” The framework used by UNDP draws from the work done by Chambers and Conway (1992) who define sustainable livelihood thusly: “A livelihood comprises the capabilities, assets (including both material and social resources) and activities for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks maintain or enhance its capabilities and assets, while not undermining the natural resource base.”

PEI highlights the following five policy interventions:

1. Access to assets;
2. Asset improvement;
3. Infrastructure and technology development;
4. Employment and compensation for the poor; and
5. Market and planning reform.

Although the sustainable livelihoods paradigm of UNDP introduces the concept of capabilities, it can be seen from these five policy interventions that the focus is still based heavily on income generation and commodities. Therefore, in essence, there are two striking similarities between PEI and the WBES. The first is the perception of environmental resources as commodities that are to be used for income generation. The second lies in the pre-occupation of using commodities and income as the principal factors in reducing poverty.

The organizations behind the PEI and the WBES cannot be faulted for the misconstrued perception of the environment purely as a commodity. All three organizations—the World Bank, the UNDP and the EU—have their roots in anthropocentric development and therefore would naturally treat the environment as a good or commodity that is to be used for development. There is merit in adopting such an approach because it is the environment that ultimately provides the necessary materials for human existence.

However, we also need to acknowledge that environmental resources also provide life-supporting services to humanity. Both initiatives acknowledge this critical point but do not address it in their frameworks.

The key to the problem here lies in fully understanding the limits of environmental systems and in integrating these into poverty reduction programs. This requires an organization that understands ecological systems and the role they play in preserving critical life-supporting services that the poor cannot buy if they are priced through the market. This, of course, assumes that these services can even be priced in the first place.

The 1997 Nairobi Declaration, adopted by the UNEP Governing Council and endorsed by the United Nations General Assembly, clearly establishes UNEP as “the principal United Nations body in the field of the environment” and clarifies its role as the “leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development and serves as an authoritative advocate for the global environment.”

3. Plugging the Gap: A Plausible Conceptual Framework for UNEP

UNEP’s role in the poverty-environment nexus should not be one of re-inventing the wheel but built on the work done by the earlier two institutions. The Achilles heel of the existing approach by the WBES and PEI, as stated earlier, lies in the one-dimensional commoditization of the ecological system.

There is therefore an urgent need not to treat the environment just as a commodity but as having a dual purpose of providing commodities as well as life-supporting services. This is a gap that UNEP can address given its mandate and its comparative advantage in the field of environmental resources and ecological systems.

3.1 Ecological Services or Functionings

Ecosystem services maintain biodiversity and the production of ecosystem goods, such as seafood, forage, timber, biomass fuels, natural fiber, and many pharmaceuticals, industrial products and their precursors. In addition to the production of goods, ecosystem services are the actual life supporting functions, such as cleansing, recycling, and the renewal, and they confer many intangible aesthetic and cultural benefits as well (Daily et.al 1997)

We can categorize the various goods and services ecosystems provide into the following three broad groups (Daily 1997):

- a. Provisioning
- b. Regulation
- c. Enriching/Cultural

Provisioning covers ecosystem goods that are primarily used for economic activities. This is the category that a major bulk of the work on valuing environmental resources has been done. It is also the constituent that the World Bank’s Environment Strategy and UNDP’s PEI program addresses.

The ecosystem services like cleansing, recycling, and renewal will be elements of the regulation constituency. The aesthetic and cultural benefits will form the enriching component of ecosystem

services. Although there is mention of these valuable and in fact indispensable services in the existing two poverty-environment initiatives, there really is a lack of formal treatment of these factors.

Michael Toman (1992) has suggested that the life-supporting characteristics (in this case, the regulation constituency) may be resolved by recognizing that some issues can be appropriately managed through the markets while others require the application of the “safe

minimum standard” (SMS) approach to protect the essential life-supporting services of ecological systems.

The safe minimum standard posits a socially determined, albeit “fuzzy” dividing line between moral imperatives to preserve and enhance natural resource systems and the free play of resource trade-offs. Following a safe minimum standard, society would rule out actions that could result in natural impacts beyond a certain threshold of cost and irreversibility. Central to the safe minimum standards approach are the role of decision-making and the formation of societal values (Toman 1992).

If we are to categorize the three functions ecological system provide into what Toman classifies as market and non-market issues, we can quite confidently put provisioning functions as a market good while enriching and regulation will fall under the non-market domain. These two constituents in turn will need to have SMS set if these functions are to be provided by ecological systems.

One of the challenges of the SMS approach is the identification of the standards. There was little knowledge on the functionings of ecosystems, and even less data on the various ecosystems, five decades ago. However, the science of ecosystems has improved over the last 50 years and the information base on the various eco-systems has also improved. The Global Environmental Outlook (GEO) and the Millennium Ecosystem Assessment (MEA) are two UNEP-supported programs that can provide valuable input into this process. This will especially be true in the case of the MEA which has acknowledged the important roles ecological systems play apart from just the provisioning of economic goods but also the regulation and enriching services they provide.

But science is only one side of the coin. The other is the willingness of society to adopt the SMS recommendation; especially in light of the poverty alleviation programs currently advocated by policy-makers and stakeholders at all levels. This brings us to the second premise.

3.2 Human Functionings

We draw on the work of Nobel Laureate Amartya Sen to establish the move away from a purely income-commodity space as a solution to the poverty problem to the broader space of functionings and capabilities.

Professor Sen explains functionings as what an individuals values doing or being. He goes on to differentiate between elementary and complex functionings. He defines elementary functionings as the basic values that all people should be able to meet in order to acquire the capability to achieve well-being. Examples would include avoidable diseases, safe and clean shelter, adequate nourishment, etc. Complex functionings are related to sophisticated aspirations like community leadership, graduate education, etc.

Functionings are different from commodities in that functionings are features related to the state of existence of a person. For example, having adequate nourishment is a functioning while a slice of bread is a commodity. For example, two slices of bread may provide adequate nourishment for a healthy male but a pregnant woman may need four slices in order to meet the adequate nourishment. The personal characteristics of individuals will influence the level of commodities that are needed to meet a functioning.

But it should be noted that functionings and commodities are not two unrelated concepts. A functioning is achieved by a person's ability to use relevant commodities. For example, learning is a functioning that is achieved through a combination of schools, teachers and personal characteristics like being able to get to school, having adequate nutrition and health to concentrate, etc. It can be seen from this simple example that just the provision of schools does not imply education. There are a host of other factors. It is this strength of functionings that allows individual characteristics to be taken into account that a commodity space does not permit.

The question that begs itself now is: how do elementary functionings relate to ecological life-support systems and SMS? Many of the elementary functionings, albeit not all, are closely related to not only the provisioning constituent of ecosystems but also the regulation and enrichment services provided by environmental resources. We can argue that all people—rich and poor—depend on the services provided by environmental resources. This is however only true in the long run. In the short run, the poor are more heavily-dependent on these services than the rich. For example, the rich can chose to live in areas that are away from industrial activities or buy the water filtering and purification systems to get clean water. The poor can only depend on environmental systems for these elementary functionings.

Another example is the smog crisis in Southeast Asia, caused by forest fires in Indonesia. The rich were able to isolate themselves from the smog by buying air-conditioners, air-cleaners, special surgical masks, etc. The poor, and especially the children, had no option but to be exposed to the full impact of the smog with disastrous effects on their health. Their elementary functioning space was compromised. These impacts may have been avoided if SMS had been established. SMS could have prevented the forest fires in the first place and, secondly, would have provided the necessary ecological regulation services to accommodate and clean the system in a relatively efficient manner. This would then have provided the clean air so critical for poor people who can ill-afford the health implications of poor air quality.

By introducing the concept of elementary functionings, we will be able to link some of the services provided by the regulation and enriching properties of ecological systems directly to the well-being of people, especially the poor.

Therefore, while in the past, SMS were primarily discussed within the context of ecological preservation or conservation policy, we can now make a strong argument for SMS as a resource the poor can use to meet some of their elementary functionings—especially those closely dependent on the life-supporting services provided by ecological systems.

3.3 Instrumental Freedoms and Institutions: The Bridge between Human Functionings and Ecological Services

The link between ecological functionings and human elementary functionings is however not a simple linear relationship. It is governed by a complex nexus that involves a variety of stakeholders interacting with each other within an economic, social and political sphere. The diagram in figure one represents a simplified but illustrative description of this nexus.

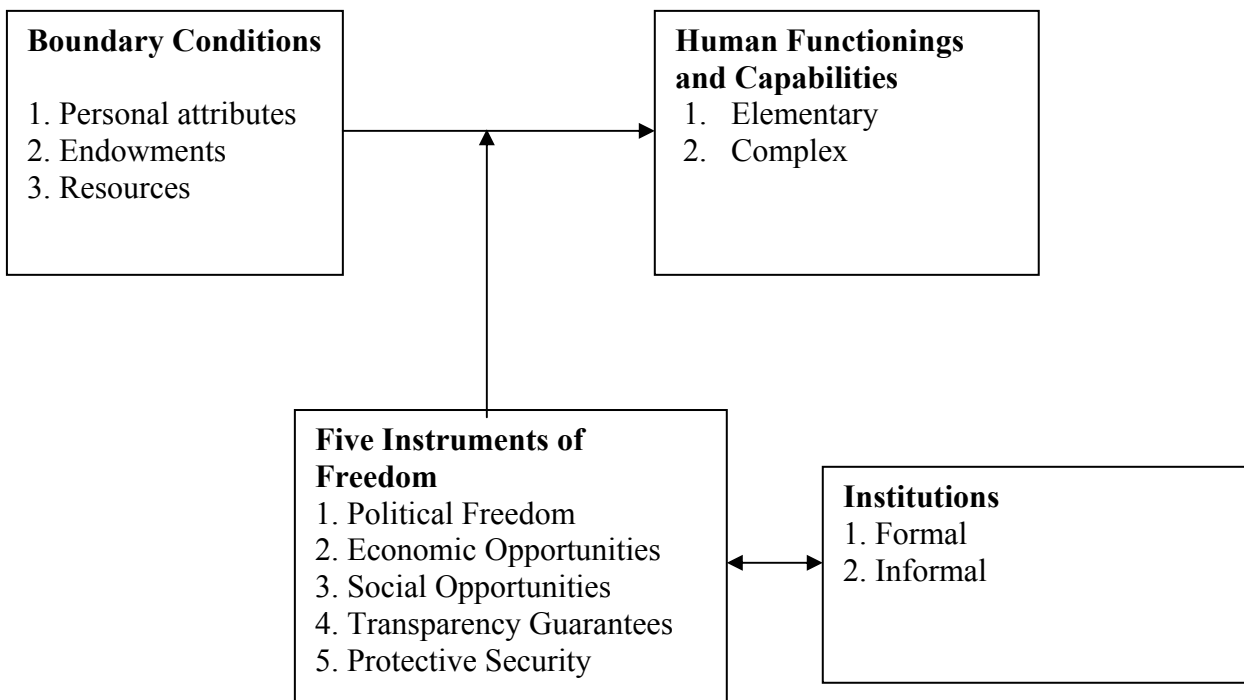


Figure 1. The transition from boundary conditions to functionings and capabilities.

The boundary conditions box captures the personal characteristics of individuals at any point in time. Endowments describe the economic wealth of the individual. Resources describe the collective wealth available in the economy. This includes physical capital, financial capital, social capital and the *provisioning constituent* of ecological systems. Attributes refer to the personal characteristics of individuals, including physical abilities or disabilities, age, gender, etc.

The conversion of commodities to functionings/capabilities is through a utilization function that is unique to each individual. The success of converting commodities to functionings depends critically on his or her access to what Professor Sen calls the following five instruments of freedom:

1. Political Freedom – Political freedom can be broadly conceived as civil rights—the right to choose the leaders to lead; the freedom of information exchange and disclosure.
2. Economic Facilities – Economic facilities refer to the opportunities to convert resources for the purpose of production, consumption and exchange; micro-credit is an example of an economic facility.

3. Social Opportunities – Social opportunities relate to the arrangements society makes available for all members for the basic necessities like education and health so as to allow them to live better lives and be productive members of society.
4. Transparency Guarantees – Transparency guarantees relate to trust and the notion of openness. This is a critical element to prevent corruption and exclusionary types of behavior by some against others.
5. Protective Security – Protective security is necessary as a safety net against adverse events that may render individuals helpless. The main focus has been on social nets. We include Ecological Security, the maintenance of the regulating and enriching services of ecological systems as a critical component of protective security.

He asserts that the lack of any of these instruments of freedom reduces the efficiency of her utilization function to convert her commodity space into her unique functioning space. This is the situation in which the poor typically find themselves and what is touted in the literature as the vicious downward spiral.

Ecological Security covers clean air, a stable and clean supply of water, and the reduced impacts of natural disasters—the life supporting services provided by the regulating and enriching constituents of ecological systems.

For example, let's say that a poor individual has only her labor as her asset. In order to turn that commodity into some of her elementary functionings, she would need to have access to economic facilities that allows her labor to be used to earn income in order to purchase adequate nutrition. She will need to have access to some of the social opportunities in the form of basic medical services and education to make sure that she is healthy in body and mind. But equally important to her well-being is the presence of

ecological security. She will need to have the peace of mind knowing that she will have her elementary functionings fulfilled in order to increase her capability to achieve her well-being.

In the framework presented above, we have grouped institutions and freedoms together and formulated them as the vortex of a complex nexus of primary goods, functionings and capabilities. The transition from primary goods to functionings and capabilities is governed and influenced by the Institution-Instrumental Freedom (I-IF) nexus.

Professor Sen also stresses the critical role institutions play in the development of these freedoms. This is clearly demonstrated by the following extract from his book, "Development as Freedom".

Individuals live and operate in a world of institutions. Our opportunities and prospects depend crucially on what institutions exist and how they function. Not only do institutions contribute to our freedoms, their roles can be sensibly evaluated in the light of their contributions to our freedom (Sen 1999, pg.142)

We shall argue that the evolution of freedom is the vehicle for the enlargement of functionings and capabilities, and in turn, the rate at which freedoms evolve depends on and determines, the rate of evolution and efficiency of institutions. Therefore, the degree of freedom, or, in other words, capabilities, enjoyed by individuals at any moment is dependent on the efficiency and effectiveness of institutions. It is therefore imperative to address the issue of differentiated access to institutions by the poor, especially the institutions governing the access and use of environmental resources.

In light of the relationship between SMS, elementary functionings and the poor, the concept of SMS and stewardship by the poor can be quite complementary. It is well known that regulations set and monitored by authorities have had limited success. The concept of stewardship by the poor is not new. There are numerous examples of community forest and water management programs in a variety of developing countries. It is only natural that communities that are dependent on environmental resource bases be given stewardship over the use and management of these resources including water, land and air. The stewardship opportunity to the poor introduces the concept of environmental safety nets—similar to the concept of social security nets. However, transferring stewardship over to the poor does not by itself imply that poverty will be reduced and that the resource will be managed sustainably.

This brings us to institutions and the need for new environmental institutions that will need to be put into place before the dual objective of poverty reduction and sustainable environmental management can be achieved. Toman stresses that the process of setting SMS must be participatory and transparent in order for the mechanism to have validity and to be successful. In other words, the institutions supporting SMS must evolve from a participatory and transparent process that involves the poor if they are to be successful in reducing poverty.

3.4 The Way Forward: Synthesis of the Conceptual Framework

Based on the above discussion, we can identify three main ingredients that a UNEP conceptual framework to the poverty-environment problem should have:

1. The first premise of a UNEP approach can begin by recognizing ecological systems as not just a provider of economic goods but also as a life supporting mechanism through its regulation and enriching services. The concept of ecological services or functionings provides a possible framework to codify these services while safe minimum standards (SMS) offer a mechanism whereby these services can be operationalized.

2. The second premise of a UNEP approach is to move away from the commodity-income paradigm to a doctrine steeped in elementary functionings and capabilities that embraces values, beings and freedom in addition to commodities and income. The concept of capabilities is naturally supported by the concept of life-support systems and safe minimum standards established by the first premise. The SMS will, in essence, allow the poor the freedom to achieve the human elementary functionings like clean air, clean water and safe environments.
3. The third premise of a UNEP approach is that poverty reduction strategies and environmental management practices can only be sustainable if:
 - i. The ecological regulation and enriching services and human elementary functionings are analyzed within an integrated framework that captures the dynamics of interaction between people and nature; and
 - ii. There is ownership by the poor of recommended changes—a bottom-up participatory approach. This implies that the poor should initiate issues, reasons and proposed changes but together with other stakeholders.

In the next section, we present a methodological framework that integrates the three basic blocks discussed within the conceptual framework. The methodological framework is intended to provide a working framework that is able to provide guidance in developing a set of operational and practical guidelines.

4. PASIR: A Methodological Framework

We use the Pressure, Activity, State, Impact, Response (PASIR) framework (Duraiappah et al. 2000) as the methodological framework to operationalize the conceptual framework presented in this paper. It is critical to identify and differentiate all the various individuals or groups who play significant roles in order to shed light on the poverty-environmental degradation nexus. For this purpose, we introduce the socioeconomic activity component. Secondly, it is important to observe changes and impacts not only among the three constituents within ecological services or functionings, but also in elementary human functionings. In order to capture these changes, we introduce socioeconomic states and impacts to modify the original system.

By integrating the ecological and poverty systems, we are able to decipher the **WHO, WHAT, WHERE, WHEN** and **WHY**: who is responsible for which changes that occurred: and where, when and why were these changes initiated. In this manner, we address the stakeholders involved, the ecological systems used, the spatial and temporal dynamics of the changes, and last but not least, the driving forces or pressures causing the changes.

PASIR: Some Critical Definitions

Pressure points are the driving forces that have an impact on ecological and/or socioeconomic states through socioeconomic activities. For example, a tax subsidy for forest clearing that may cause a reduction in forest cover, i.e., a change in ecological state, is an example of a pressure point. An analysis of pressure points translates to an analysis of institutions and the relationship that exists between the institutions in question to the various instruments of freedom.

Socioeconomic Activity is introduced for the following reasons:

- a) When a pressure point is applied, changes in the ecological state can only come from economic activities and not from a policy. It is the behavioural response by the various stakeholders that is critical.
- b) It allows us to differentiate the degree and type of activities set in motion by different groups of stakeholders in the economy.
- c) The links with pressure points highlights which stakeholder groups have access to which of the five instruments of freedom and through which institutions.

Ecological States are meant to reflect the characteristics of the ecological systems under study. The primary challenge will be categorizing the three constituents of ecological systems and developing indicators to reflect changes and the resulting impacts across these three factors. These indicators should be developed in conjunction with the various stakeholders and especially the poor.

Ecological Impacts are very closely linked with the ecological states. Again, the choice of indicators is crucial. The indicators must be closely related to those used in ecological states and the causality relationship between the two must be clear and transparent.

Socioeconomic States refer to the elementary functionings. The choice of indicators is crucial and is again largely influenced and chosen by the stakeholders.

Socioeconomic Impacts are a natural extension to the socioeconomic states. Changes in socioeconomic states by themselves do not say much, but the actual impacts they have on the socioeconomic system give an idea of the importance and significance of the changes.

Responses are societal reactions to changes. There are in principle two types of responses—formal and informal. The response category illustrated in Figure 2 shows only the formal responses. These are typically responses initiated by the government, multilateral and bilateral donor agencies. Informal responses, on the other hand, are captured explicitly by the feedback relationship between socioeconomic impacts and socioeconomic activities. Informal responses are primarily reactive behavior on the part of individuals or groups to changes in their socioeconomic states and, consequently, the socioeconomic impacts.

Figure 2 illustrates how the various components in the modified framework—Pressure, Activity, State, Impact, Response (PASIR)—operate in a dynamic environment of feed-forward and feedback causality relationships. In order to fully understand the unique strengths of the PASIR system, we provide below a step by step analysis of the various links and how they interact with each other.

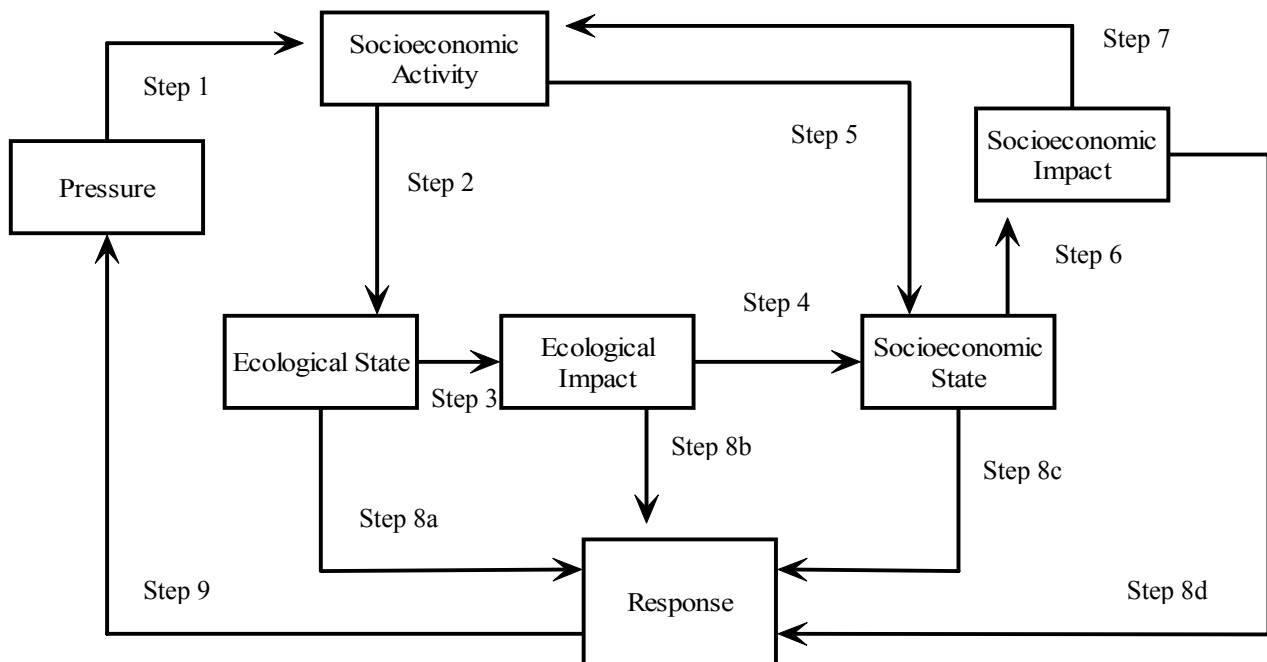


Figure 2
The Pressure Activity State Impact Response (PASIR) framework (Duraiappah et al. 2000)

Step 1 - Pressure Points to Socioeconomic Activities

We begin by looking at how pressure points influence the socioeconomic activities of the various stakeholders in the area under study. For example, an agricultural crop subsidy may provide the incentives for some stakeholders to expand their land holdings while other stakeholders who are not farmers may be tempted to lease out or sell their land.

Step 2 – Socioeconomic Activities to Ecological States

This step allows us to follow the cause-effect link between socioeconomic activities and ecological states. For example, a land tenure policy that promotes the clearing of land as a pre-requisite for ownership may cause an excessive drop in forest cover.

Step 3 - Ecological States to Ecological Impacts

Once the changes in the ecological states have been documented, the next step is to identify the ecological impacts caused by the changes in the states. Following on the example given in step2, this may range from an increase in downstream flooding, and/or a decrease in the supply of water.

Step 4 – Ecological Impacts to Socioeconomic States

In this step, we investigate the effects ecological impacts will have on socioeconomic states. This is a critical step in our analysis as this will provide us with the information on how changes in the three constituents of ecological systems have had an impact on the socioeconomic states of the various stakeholders. For example, a decrease in the water supply may force farmers out of business or livestock owners to loose their herds.

Step 5 – Socioeconomic Activities to Socioeconomic States

This step covers the second causality relationship emanating from the socioeconomic activity node. Socioeconomic activities themselves will have a direct impact on the socioeconomic state of the various stakeholders in the area under study. For example, an increase in land leased out to farmers may increase their immediate socioeconomic state.

Step 6 – Socioeconomic States to Socioeconomic Impacts

Changes in socioeconomic states provide valuable information but we still need to go one step further. The actual impacts caused by the changes in the socioeconomic states are those that really are of value. For example, a change in income levels does not tell us whether the person is starving but the impact which states that there is no money to buy food—a socioeconomic impact—tells us that there is a serious problem of destitution.

Step 7 – Socioeconomic Impacts to Socioeconomic Activities

The socioeconomic impacts, on the other hand, are slightly more complex, as they are caused by changes in the socioeconomic states. An example of a change in socioeconomic state is a drop in income levels. The corresponding socioeconomic impact is poverty if the drop in income levels causes the person to fall below the poverty line. The socioeconomic impact, in this case poverty, then sets in motion certain socioeconomic activities which are expected to help counter the drop in income levels, i.e., the initial change in socioeconomic state. This cyclical causality link presents the first form of a feedback loop.

Step 8 – Identifying Responses

The last link in the chain of causality is the response category. There are four ways in which responses can be triggered:

- a) A direct response to changes in the ecological state;
- b) Impacts driven by the changes in the ecological state;
- c) Changes in the socioeconomic state; and, finally;
- d) Socioeconomic impacts. Needless to say, the policy responses stemming from each of these triggers can have far-reaching consequences.

Step 8a – Ecological States to Responses

A 8a type response triggered by changes in ecological states can be considered as a reaction primarily driven by altruistic reasons. The primary reason for such a reaction is for no other reason than those changes in the ecological states are neither desired nor wanted. A response at this point does not even imply an ecological disaster because, for example, the removal of forest cover does not by itself necessarily constitute an ecological disaster. It is the ecological impacts caused by these changes that are relevant in deciding if a policy response is necessary.

Step 8b – Ecological Impacts to Responses

This now brings us to a type 8b response. Ecological impacts caused by changes in ecological states pose a much stronger argument for policy intervention. For example, forest cover reduction can cause a loss in biodiversity or an increase in the frequency of floods. But a response to these ecological impacts is primarily driven by ecological considerations alone. No economic considerations come into play at this point.

Step 8c – Socioeconomic State to Responses

The third type of response—a type 8c—can be triggered by changes in socioeconomic states. Using our earlier example, this would imply a response to falling income levels that were originally caused by an increasing occurrence of floods or loss of biodiversity. But the question to ask here is whether any reaction is necessary in these economic circumstances. Falling income levels by themselves do not say much and justifying a policy response to declining income may be difficult socially and economically.

Step 8d – Socioeconomic Impact to Responses

This brings us to the fourth type of response—type 8d— a response triggered by socioeconomic impacts caused by changes in socioeconomic states. For example, if falling income levels lead to some or all groups descending into poverty, then a response is justified on social, economic and environmental grounds. The response at this level captures the complete dynamic forces causing poverty because the complete causality chain has been incorporated at this point.

Step 9 – Responses to Pressure Points

This constitutes the final step whereby the responses are linked to the pressure points that influence the socioeconomic activities - the driving forces behind the causality chain. The responses can either be in the form of adjustments to existing policies or the formulation of new policies.

The PASIR model provides a unique framework to capture the high degree of interdependency among various stakeholders and actors in the use of ecological systems. It is the interdependency, together with imperfect institutions, that cause the poor to be excluded from the use of ecological systems or basically “priced out” from using the services provided by ecological systems.

5. The UNEP Poverty-Environment Road Map

We began the paper by developing a conceptual model to substantiate our position that the enriching and regulating constituents of ecological systems can be used by the poor to meet their elementary functionings. The PASIR model was then presented as a methodological framework to operationalize the conceptual model. But we still need to go one step further—we need a road map that will provide a systematic process that policy-makers can use to incorporate ecological systems into poverty reductions strategies. Figure 3 provides a schematic illustration of such a road map.

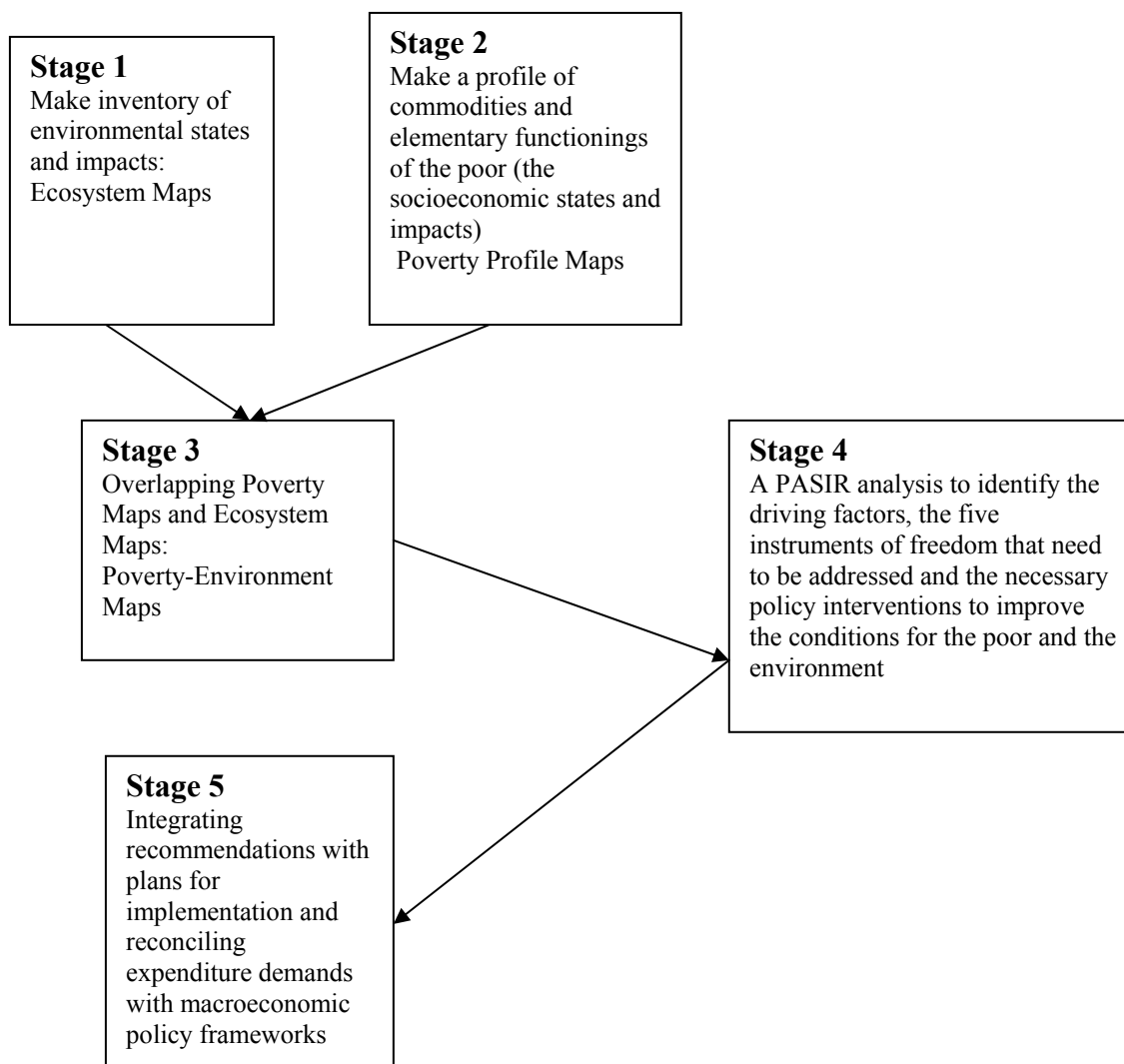


Figure 3 A road map of activities in developing the guidelines.

Stage 1 – Ecological Functionings

The main activity in Step 1 is the compilation of a list of the three key (land, water and air) environmental resources in the country, their geographic locations and their status. The unit of assessment will need to be set at this point. This will depend on the environmental sectors under consideration and the typology of differentiation that is most appropriate. For example, it can be based on ecosystems, land use and land management for the land sector. The output will be environmental resource maps; one map for each resource system. Information for this component can be provided by a number of initiatives undertaken by the World Bank, UNEP and other international initiatives—the Millennium Ecosystem Assessment, GEO as well as national, regional and local State of the Environment Reports are examples of such initiatives.

Stage 2 – Elementary Functionings

- a) We begin by identifying the poor and formulating a poverty profile by making an exhaustive list of the “primary goods” owned or accessible to the poor—the entitlements box in Figure 1. This will provide an overview of the characteristics of the poor with respect to their endowments, the resources and personal attributes.
- b) The next step involves developing an elementary functioning space for the targeted poor. We call this a functioning assessment and stress that this process should be participatory in nature whereby the poor themselves identify the elementary functionings they value as important to them and that they wish to achieve. It could range from adequate shelter, water, clean air, sanitation, medical, property rights, etc. It is important to keep in mind that we are primarily interested in elementary functionings in this exercise.
- c) The combination of the two sets of information will help us build a poverty profile and subsequently poverty profile maps. Information from this map will give policymakers an idea of who the poor are, where they are located, an overview of their strengths and weaknesses and the elementary functionings the poor would like to achieve.

Stage 3 – Poverty-Ecosystem Mapping

In Step 3, we overlay the poverty maps and the environmental resource maps to identify the hot spots that need attention.

Stage 4 – The PASIR Analysis

- a) The main activity in step 4 involves identifying the primary drivers for the environmental changes and the effects these changes have on the poor. This will involve a participatory process with the poor to investigate the drivers and the ways by which these drivers are contributing to their situation. The participatory process should also involve the poor in soliciting their recommendations, especially those associated with institutional changes.
- b) The main tool used for this analysis will be the PASIR framework.
- c) The next step will be to compute an analysis of trade-offs between the goods and services functions of ecosystems with those of the life-supporting services, especially with respect to the poor. The process will involve developing indicators for the various services that ecosystems offer. This will include the economic goods, services and life-supporting services. These indicators will then be correlated with the

- elementary functionings of the poor (from the poverty profile) and thresholds or SMS for the various ecosystems will be determined.
- d) The next step will involve the formulation of responses with the primary objective of ensuring that all the elementary functionings that are related to ecosystem life-supporting services are provided to the poor. These can range from SMS to market-based instruments at the other end of a continuous spectrum.
 - e) Once the instruments have been identified, the next step will involve the formulation of institutions that will make sure that the instruments are implemented successfully and that the poor are the direct beneficiaries of the interventions.
 - f) The last step in this stage will be the compilation of appropriate indicators that will provide information on the success of the policy interventions.

Stage 5 – Integration into local, regional and National Policy Frameworks

- a) The first activity in Step 5 is to evaluate and appropriate the funds needed for filling the gaps. This involves a budget appropriation process for the public sector. The level at which this occurs depends on the judicial boundary and the degree of autonomy each jurisdiction has over revenues and expenditure.
- b) Next, decisions will need to be made on what flows can be financed by the public sector and those that need to be supported by the private sector.
- c) The expenditure items to be undertaken by the public sector will need to go through the necessary budget process. The degree of external funding and donor aid will be determined at this point. Many of the recommendations related to social opportunities, SMS under security and physical structures to enhance economic facilities will need to be financed with public funds. This will include the appropriate institutional costs that will accrue when the institutions to support the implementation of the five instruments of freedom are put in place. This is a factor that is often ignored in planning and budgetary decisions but institutional costs in the form of transaction costs can be significant (North estimates that transaction costs make up approximately 45 per cent of the American economy).
- d) The items to be financed by the private sector will need to be scrutinized by the public sector. Incentive factors if required will need to be taken into account in the budget process. This may be in the form of tax allowances and/or subsidies in various forms.

6. Synopsis and the Way Forward

Current initiatives on addressing the poverty-environment link focus on the provisioning constituent—*the provisioning of goods for economic uses*—of ecological systems and identifying ways and means by which the poor can have access to this factor. However, provisioning is only one component of ecological systems.

We have shown that there is a strong need for incorporating the regulation and enriching constituents—*the life supporting services*—of ecological systems into poverty reduction strategies of developing countries. The services provided by these two components are indispensable for the poor. The impoverished need these services to meet the elementary functionings—*adequate nourishment, clean water, clean air, avoidable diseases*—they require to enhance their capabilities to achieve the well-being they desire. If they are not able to get these from the ecological systems, they will then need to pay for these services at disproportionately higher prices than the “better off” in society, in most cases.

The conceptual framework presented in this paper attempts to incorporate the enriching and regulation constituents of ecological systems into poverty reduction strategies. We achieve this by framing the access to the services provided by regulation and enriching as a fundamental freedom that is used instrumentally by individuals to increase their capabilities to achieve the well being their want. This is in contrast to the provisioning component which is treated as a “capital.”

In this manner, we take life-supporting constituents of ecological systems out of the realm of the market and instead make an argument that they should be provided as an instrument of freedom to be used in an instrumental manner to enhance the capability of the poor.

We then went on to make a strong case for allowing the poor to take stewardship of the enriching and regulation constituents of ecosystems. But we also stressed that stewardship by the poor will not automatically imply sustainable use of the ecological systems. There will be a strong need for institutions—*the rules of society*—that govern and monitor the use of ecological systems to ensure that these two constituencies are sustainably managed. And these institutions need to evolve from an open, transparent and participatory process whereby the poor or disenfranchised have active involvement.

The road map presented in Figure 3 gives a step by step description of the process that policy-makers need to undertake if they want to incorporate ecological systems into poverty reduction strategies. The road map is in essence the seed for the development of a set of guidelines that policymakers can use as a manual when developing poverty reduction strategies. The guidelines developed from the concepts presented in this paper should be viewed not as an alternative to the existing manuals or source books produced by the World Bank and the United Nations Development Program. Rather, it should be perceived as a complementary product to be used in conjunction with these existing manuals in order to provide an integrated and comprehensive approach to poverty reduction through the sustainable use of ecological systems.

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