

RWANDA ENVIRONMENTAL MANAGEMENT AUTHORITY
(REMA)



POVERTY-ENVIRONMENT INDICATORS

**And Strategy for Monitoring them within
the framework of the EDPRS**

Final Report

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Foreword

The annual progress reviews for Poverty Reduction Strategy Paper I (PRSP I) consistently highlighted inadequacies in integration of environment into national development planning processes. In the face of growing evidence of the role of environment and natural resources in sustainable development, the Government of Rwanda (GoR) sought partnership to promote the integration of environment into national planning processes and economic development strategies.

These efforts were concretized at a national workshop held in Gisenyi in February 2005 on “Integrating Environment Issues and Rio Multilateral Environmental Agreements (MEAs) into Poverty Reduction Policy and Planning”. At the workshop, the Government of Rwanda (GoR) established partnership with UNDP/UNEP Poverty and Environment Initiative (PEI)¹ to develop a strategy to mainstream environment into national development strategies and sectoral plans. This led to the launch of the Rwanda Poverty and Environment Initiative (PEI) programme to support the second generation of PRSP II known as the Economic Development and Poverty Reduction Strategy (EDPRS).

The Rwanda PEI was envisaged to be implemented in two phases over a 4-year period. Phase I would commission studies and develop tools aimed at ensuring that evidence based advocacy tools to primarily inform policy were available to support the formulation phase of the EDPRS. These studies and policy advocacy tools that would be generated under PEI would evaluate the integration of environment into PRSP I with a view to addressing the earlier deficiencies in the planning of EDPRS. Further the studies and advocacy tools would support the formulation of EDPRS and the District Development Plans (DDPs).

The intended outcome of the Rwanda PEI was the integration of environment into national policy and planning processes to implement the EDPRS. One of the tools developed to support this objective was Poverty and Environment Indicators and a Strategy for monitoring them within the framework of EDPRS. Development of PE indicators is one of the milestones in the EDPRS formulation roadmap, and a key activity area of the global PEI. Thus, the tool facilitated the process of identifying and subsequently integrating environmental indicators in the logframes that will play a crucial role in the implementation of the EDPRS.

The Rwanda PEI aimed to enhance the contribution of sound environmental management to poverty reduction, sustainable economic growth and achievement of the Millennium Development Goals. The project was coordinated by the Rwanda Environment Management Authority (REMA) in collaboration with the Ministry of Lands, Environment, Forests, Water and Mines (MINITERE). The overall coordination and guidance to the project was provided by

¹ The Poverty and Environment Initiative (PEI) aims to help countries develop their capacity to integrate the environmental concerns of poor and vulnerable groups into national policy and planning frameworks for poverty reduction and pro-poor growth.

a cross Ministerial task team as well as development partners that comprised of MINITERE/ REMA, MINECOFIN, MINAGRI, MININFRA, MINALOC, UNEP and UNDP.

I wish to thank the various national institutions which were part of the task team on the project that have provided the necessary support to the project as well as the integration of environment and natural resources in the overall national policy and planning processes.

The inter-Ministerial coordination and the support from the development partners, UNEP and UNDP provided valuable support and guidance that made it possible for the success registered under the project. It was a clear demonstration that true partnership breeds success and all parties are highly appreciated and commendable for the individual as well as collective contribution to PEI, Rwanda.

Sincerely,



Dr. MUKANKOMEJE Rose

Director General

Rwanda Environment Management Authority (REMA)

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Executive Summary

Poverty-environment (PE) indicators are about establishing and monitoring the links between poverty and environment. In Rwanda, the first specific initiative to focus on poverty and environment links was the UNDP supported pilot project poverty-environment mapping (PEM) in 2003.

Indicators are considered useful in simplifying, clarifying and monitoring the complex links between poverty and environment. The Rwandan experience has demonstrated that PE issues cut across all the seven MDGs and their specific targets. Therefore, their inclusion in the M&E system for the EDPRS and other national development strategies and plans will contribute to more effective focus towards meeting the MDGs.

Understandably, advocacy for the PE issues in the EDPRS process is still somewhat sluggish, partly because the process of developing tools and capacity for environmental advocacy is still in progress. More pertinently, there is still limited capacity to generate necessary competencies for appropriate analysis and subsequent inclusion of PE issues in sector priorities.

Poverty Environment indicator development was deemed necessary in the EDPRS formulation process in order to facilitate the sector working group on environment to identify environment priorities for inclusion in the EDPRS. As successful environment mainstreaming would depend on existence of an effective monitoring and evaluation framework, generation of PE indicators was identified as a critical activity under the Poverty Environment Initiative (PEI) project under whose auspices this study was commissioned. Thus, PE indicators were instrumental in the formulation phase of EDPRS and are envisaged to play a crucial role in the implementation of the EDPRS.

The PE indicator development process involved a range of methodologies including literature reviews of existing in country survey results, participation in EDPRS sector working groups meetings and workshops as well as interviews with key technical staff in different sectors/ Ministries. The literature review was informed by, among other material documents; the following: Demographic and Health Survey (DHS), The Household Living Conditions Survey (HLCS) (also known by its French acronym EICV), Participatory Poverty Assessment (PPA), The Core Welfare Indicators Questionnaire (CWIQ) Multiple Indicator Cluster Survey (MICS) and Agricultural surveys -The Food Security Survey, The Public Expenditure Tracking Study (PETS),

Other sources of PE data included:

- » UNICEF - nutrition, water and sanitation - specifically the child survival programme and
- » WFP - food security monitoring/ early warning systems (FEWS)

A systematic approach to identification of relevant PE indicators for the EDPRS and beyond was used. The stepwise selection criteria followed the following stages:

1. Identifying and clarifying the PE links that distinguish PE indicators from others;
2. Setting the selection criteria - the identified PE indicators, based on the clearest and locally relevant PE links were subjected to criteria suggested by Segbestam (1999) and others, viz: Policy relevance, Measurability, Clarity of the linkage between poverty and environment, Sensitivity to changes in data and availability or ease of setting targets and baselines to name a few.
3. A core list of key P-E indicators was then developed and assessed for their policy relevance by comparing with the priority issues identified in the EDPRS Environment and Land Use Management Sector Working Group (SWG) log frames.
4. Categorising the indicators - into intermediate and impact indicators and identifying data sources and data availability;
5. Priority PE indicators and documenting: A core set of priority indicators was then developed and baselines and targets set where data existed (see tables 3 and 4); and
6. Selection of few final indicators for inclusion into the EDPRS monitoring.

A stakeholder validation workshop recommended further selection of few indicators (at most 2 impact level indicators for each sector) that would form part of the key performance indicators for the purpose of monitoring and evaluation during the EDPRS implementation phase. This is reflected in tables 5 and 6.

PE monitoring in Rwanda will be possible if: proper baselines are established and realistic targets set, reliable data is collected regularly and consistently, competent personnel are recruited, trained and retained, and institutional facilities are developed to collect, analyse and report on indicators, and a framework for coordination and building synergies is put in place.

Thus applying PE indicators in Rwanda will require on-going PPA that rely on functional institutions linked with the National Institute of Statistics (NIS). This will be possible by ensuring the existence of an environmental data management system supported by periodic reviews and follow-up actions to ensure PE issues stay on top of the policy /program agenda. In this respect, public expenditure reviews (PERs) could be used to keep track of resource allocations and expenditure to facilitate and guide effective environmental mainstreaming.

The set of PE indicators here presented is a working tool which is expected to be continuously reviewed and improved with practical lessons in monitoring of PE issues. There is emphasis that the ultimate target of PE indicators is to help influence decision making in the relevant sectors. Indeed (as noted by Segnestam 2002), not until the required information is achieved and the decision making processes have integrated such information, can the goal of indicator development be said to have been achieved.

List of Acronyms and Abbreviations

AEO	African Environment Outlook
APR	Annual Progress Report
CRC	Citizen Report Cards
CWIQ	Core Welfare Indicator Questionnaire
DDP	District Development Plan
DFID	Department for International Development (UK)
DHS	Demographic and Health Survey
DPC	District Performance Contracts (<i>Imihigo</i>)
DSOER	District State of Environment Report
EDPRS	Economic Development and Poverty Reduction Strategy
EFA	Education for All
EIA	Environmental Impact Assessment
EMIS	Education Management Information System
FAO	Food and Agricultural Organisation (of the UN)
GIS	Geographical Information System
GoR	Government of Rwanda
HLCS	Household Living Conditions Survey (<i>French acronym. EICV</i>)
HMIS	Health Management Information System
ICT	Information and Communication Technology
IEA	Integrated Ecosystem Assessment
ISAR	<i>Institut des Sciences Agronomique du Rwanda</i>
MA	Millennium Assessment
MDGs	Millennium Development Goals
M&E	Monitoring and Evaluation
MICS	Multiple Indicator Cluster Survey
MINAGRI	Ministry of Agriculture and Animal Resources
MINALOC	Ministry of Local Government, Good Governance, Community Development and Social Affairs
MINECOFIN	Ministry of Finance and Economic Planning
MINICOM	Ministry of Commerce, Trade, Industry, Tourism and Cooperatives
MININFRA	Ministry of Infrastructure
MINITERE	Ministry of Lands, Environment, Forestry, Water and Mines
MKUKUTA	<i>Mkakati wa Kukuza Uchumi na Kuondoa Umaskini Taifa</i> (Tanzania's Strategy for Growth and Poverty Reduction)
MoH	Ministry of Health
MTEF	Medium Term Expenditure Framework
NEAP	National Environment Action Plan
NSIR	National Statistics Institute of Rwanda
NSOER	National State of Environment Report
PE	Poverty-Environment
PEAP	Poverty Eradication Action Plan
PEI	Poverty-Environment Initiative
PEM	Poverty - Environment Mapping

PERs	Public Expenditure Reviews
PETS	Public Expenditure Tracking Study
PPA	Participatory Poverty Assessment
PRSP	Poverty Reduction Strategy Paper
QUIBB	<i>Enquete Sur Les Indicateurs de base du Bien-etre</i>
RBS	Rwanda Bureau of Standards
SWG	Sector Working Group
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
UPPAP	Uganda Participatory Poverty Assessment
WATSAN	Water and Sanitation
WFP	World Food Programme
WHO	World Health Organisation
WWF	World wide Fund for nature

“We cannot eradicate poverty and hunger without protecting the environment. Kenat Dervis, UNDP Administrator, Nairobi, January 2007

1.0 Introduction

1.1 Contextual Framework - The EDPRS Process in Rwanda

The development of poverty-environment (PE) indicators for Rwanda has been initiated as part of the design for the second poverty reduction strategy (PRS) named the Economic Development and Poverty Reduction Strategy (EDPRS). During this process, the Government of Rwanda (GoR) embarked on mainstreaming environment into the EDPRS process, inspired by lessons and experiences of the PRSP I that largely insufficiently taken into consideration, environmental concerns. Prioritising environment is also motivated by the increased knowledge and awareness at various levels, that people’s livelihoods and the national economy of Rwanda are anchored on sustainable use of environmental resources.

Specifically, the task of PE indicators is part of the UNEP/UNDP supported Poverty and Environment Initiative (PEI), a programme to strengthen national capacity for poverty and environmental policy analysis, formulation, planning and monitoring. Development of PE indicators is one of the milestones in the EDPRS formulation roadmap, and a key activity area of the global PEI. This consultancy is thus an important part of the EDPRS process. While the outputs of this study are expected to feed into the identified sector and cross-sector priorities for the EDPRS (key performance indicators), it should be recalled that the PE indicators specifically relate to direct links between poverty and environment, which is only a component of the EDPRS that covers economic development as well. The other thing to note is that PE indicators are, by definition, relational, and as such, the responsibility to track or monitor them will require joint efforts between institutions.

Although there is wide recognition across political, technical and academic spectra that environment is critical to realising economic development and poverty reduction, it is noted that mainstreaming environment is a complex process requiring a whole range of supportive policy and programming frameworks (indicators, strategies and guidelines, data or mechanisms to collect it), commitment from policy makers, and competent technical professionals. All these remain a significant challenge to Rwanda despite the progress made through such initiatives as the PEI.

1.2 Defining Poverty-Environment Indicators and their application

An indicator is defined literary as something that *quantifies and simplifies phenomena and helps understand complex realities*. And UNDP (1997) defines indicators as information or data that can be used to make decisions based on observed trends towards or away from specific goals. They can be tracked at different levels:

- *Input and output levels*: also referred to as proxy indicators, these are intermediate indicators because they confirm or monitor actions undertaken to realize the ultimate targets/ goals;
- *Outcome and impact levels* (purpose/ goal): serve as the ultimate targets in the PE

nexus, and are referred to as high level or final indicators.

Poverty-environment (PE) indicators are about establishing and monitoring the links between poverty and environment. Studies have demonstrated that by measuring the individual elements of poverty and environmental change and mapping or matching them against one another, it is possible to clarify linkages between predetermined poverty and environment issues, and provide clues to new or emerging ones.

There are several categories of PE indicators which are as diverse as the orientation and interests of institutions and groups involved, but the overall focus is the same - to help understand PE links, and to generate appropriate tools for monitoring the changes.

1. DFID, 2001, categorized the poverty-environment indicators into four:

- (i) **Poverty - natural resource indicators:** these indicators measure the extent to which poor people depend on natural resources, and how the decline in the quality and quantity of natural resources affects the poor. ODI (Overseas Development Institute) broadly defines a poverty- natural resource indicator as one “*which changes when better management of natural resources leads to decline in poverty*”. These indicators relate to income opportunities and food security.
- (ii) **Poverty-environmental health indicators:** these relate to vulnerability of the poor to diseases caused by air and water pollution, and/ or exposure to disease causing pathogens.
- (iii) **Poverty - vulnerability to natural disasters:** relates to how the poor are affected by natural and man-made disasters like floods, landslides, volcanic eruptions, droughts. These disasters affect the poor through loss of livelihoods, as a result of displacement, property destruction, deaths or injury, etc.
- (iv) **Poverty - housing indicators:** these measure the housing conditions of poor people and how they affect or are affected by their poverty situation. These indicators are closely related to environmental health but also to disasters or opportunity (e.g. in relation to scarcity of housing materials).

2. WWF¹ proposed three categories of PE indicators which, when applied together, provide some indication of the state of poverty and environment, and suggest levers which may be effected to create a stronger status change. These categories are:

- **Status indicators** - reflect the state of the environment, access to natural resources and the level of household income among natural resource- dependant communities. Status indicators provide basic measures of whether resources are available for use by communities and the state of such resources (both in terms of quality and quantity). Examples include: *size of fish stocks, rate of forest conversion, rates of topsoil erosion, percentage of income derived from non-timber forest products, number of individuals*

¹ WWF (World Wide Fund for Nature) Position Paper - March 2006. Conference of the Parties to the Convention on Biological Diversity - Eighth Meeting, Curitiba, March 20-31 2006.

or households affected by drought, number of individuals or households affected by food insecurity, floods etc.

- **Enabling conditions indicators** - are categorized into three: institutional arrangements, economic policies, and ecological management capacity. Examples include: *share of spending on PE projects in relation to other development activities, application of strategic environmental analysis for major projects, availability of incentives for protecting the environment, level of degree of access to resources by the poor.*
- **Social capital indicators** - reflect the capacity of local populations to influence basic decisions and institutional arrangements such as the ability to organize, existing networks, ability to engage in decision making, capacity to mobilize investment, ability to gain access to information and markets, etc. Examples include: *extent/ degree to which the poor can influence institutions linked to management of rural livelihoods and environmental resources, the degree to which the rural poor can mobilize resources to improve access to and management of natural resources-including investment capital and information.*

Why Poverty-Environment Indicators?

The need for more and better knowledge and information about environmental conditions, trends and impacts on development and poverty, has been recognized since the Rio conference in 1992. Indicators were deemed useful in simplifying, clarifying and monitoring the complex links between poverty and environment. In developing PE indicators, it is important to understand how poverty manifests or is defined in a specific setting, and try to establish how environmental conditions (reflected by the indicator measures) impact or influence the poverty characteristics.

2.0 Review of Poverty-Environment Issues in Rwanda

2.1 General

Although poverty-environment links were recognized as early as during the 1972 Stockholm Summit on Sustainable Development, they did not feature prominently until the 1990s with the advent of the Poverty reduction strategies (PRS). In Rwanda, the first specific initiative to focus on poverty and environment links was the UNDP supported pilot project poverty-environment mapping (PEM) in 2003. However, the lessons from PRSP I that showed clearly that environment issues had not been included, and that the whole PRSP I had lacked a clear monitoring and evaluation framework, galvanized the need for clear indicators, and the urgency of measures to mainstream environment. This current PEI can therefore be described as the first detailed support programme to address PE issues in Rwanda.

2.2 The Place of PE Indicators in Rwanda's EDPRS Process

Rwanda's medium term economic development and poverty reduction strategy (EDPRS 2007-2011) seeks to achieve 2 broad interrelated goals - promote economic growth targeting to raise per capita incomes from about US \$ 250 currently to US \$ 900 by 2020; and reduce poverty. Although the GoR aims to develop a knowledge-based economy premised on highly skilled human resource and industrialization, the natural resources (agricultural land, protected areas and biodiversity, forests and water) remain the most important basis for economic and social transformation. Various studies including those commissioned under the EDPRS, have clearly pointed out that environmental resources are, to a great extent, the basis of the Rwandan economy, and the principal source of livelihoods for about 90% of the population². More than 80% of the diseases suffered by the poor (including deaths) are environment related - particularly water and sanitation. In some areas like Bugesera (in the south Eastern region), studies have shown that provision of safe water (a vital ecosystem resource) can have significant impact on the current high levels of infant and child mortality, can help retain thousands of children in school, and significantly improve health and productivity of women's labour. PE indicators will help clarify these links, so that public investments can be better aligned to poverty reduction and economic development goals by taking consideration of the interface between environmental issues and poverty.

It is noted that a set of performance indicators are being developed through the EDPRS process, and the Environment SWG is engaged in ensuring that such sector indicators include environment as a cross-cutting issue as part of environmental mainstreaming, besides exclusive indicators on environment. While this demonstrates growing appreciation of PE issues in Rwanda, there is need to improve the conceptual understanding of these links, as well as put in place a clear strategy to monitor them. In this respect, PE indicators are important for the EDPRS in various ways:

- they underpin the *wealth base on which the poor* derive their food, income and employment. Needless to say, subsistence rain-fed agriculture which depends mostly on the natural fertility of the soils, is the mainstay of the Rwandan poor majority;

² The recent survey (HLCS 2006) estimates that 87% of the Rwandan population is dependant on subsistence farming, and agriculture accounts for about half of the GDP. Industry and services, which account for the remaining proportions of GDP, are also largely dependant on natural-resources (e.g. agro-industry, mining, wildlife tourism,...).

- *Health* is an important determinant of human well-being and the quality of water, air and settlements has a profound impact on health. National policy and recent studies (e.g. Bugesera pilot IEA) have indicated that the most common diseases suffered by the poor (including leading causes of mortality) are related to water, sanitation and hygiene (malaria, diarrhea, intestinal worms, skin diseases) and pollution (respiratory tract infections).
- *Vulnerability and social security* - prolonged drought that comes with famine, landslides that affect households on steep slopes and floods that cause deaths and loss of property, affect mostly the poor because, not only are they more susceptible (as they live in marginal conditions), they have no safety nets to mitigate against such disasters.

2.3 PE Indicators in the Context of achieving the MDGs

In Rwanda, PE issues cut across all the seven MDGs and their specific targets, their inclusion in the M&E system for the EDPRS and other national development will, therefore, contribute to more effective focus towards meeting the MDGs:

1. *Extreme poverty and Hunger* - lack of food (a vital ecosystem service) and other productive assets (essentially land), housing and social security, are the main indicators of extreme poverty in Rwanda.

2. *Achieving universal primary education* - although in 2003, the GoR declared fee-free primary education for all school eligible children in the framework of the Dakar Declaration on Education for All (EFA), persistent high drop-out rates, absenteeism and non-enrolment, undermine the success of this program. These are linked to lack of food, poor sanitation that tend to keep away girl-children, diversion of children to fetch water and firewood that have increasingly become scarce, sickness or attending to sick family members, and extreme vulnerability, all of which are PE issues.

3. *Gender equality and empowering women*: although Rwanda is on track to meet the gender equality targets in many respects (e.g. primary school enrolment for girls has surpassed that for boys, representation in leadership is above 30%, family law and protection largely favour women and children,..), progress in many other areas is slow - most rural women are exposed to indoor air pollution due to poor quality of cooking energy and this is scantily if documented at all; they lose many hours looking for water or fuelwood, a situation that deny them opportunity to engage in productive work or participate in social activities.

4. *Child mortality* - needless to emphasise, almost all the top killer or illness causal diseases in infants and young children are environmental health related - malaria, diarrhoea, malnutrition, and respiratory tract infections.

5. *Reducing maternal mortality* - malnutrition, respiratory tract infections, malaria and other critical maternal mortality and morbidity causes, are typical PE issues, which undermine human productivity and contribute to poverty.

6. *Combating major diseases (HIV/AIDS, malaria,..)* - Malaria is caused by vectors (female anopheles mosquito) whose distribution and abundance is dependant on environmental conditions (dirty stagnant water and bushes) and poor housing. These are caused by or related to environment and poverty interface. The unique links between HIV/AIDS and environment relate to nutrition (access to a balanced diet) and hygiene (access to safe water and sanitation).

7. *Ensure environmental sustainability* - its common knowledge that Rwandan poor, with or without land, urban or rural based, are dependent on environmental resources - and the message for ensuring sustainability is one for addressing poverty-environment concerns.

2.4 Status of Poverty-Environment Issues in Existing M&E Systems

Apart from the PEM initiative during 2004 the ongoing PEI is perhaps the only program working on PE issues. The PEM pilot demonstrated the suitability and potential of applying poverty-environment maps in the monitoring of Rwanda's poverty reduction and development strategy but has not been followed up. The PEI is relatively longer and wider in scope. The main activities undertaken under the PEI initiative revolve around the following:

1. Commissioning specific studies to demonstrate the links - Economic Analysts of Rugezi wetland in north-western Rwanda, which has been severely degraded with devastating impact on the local economy and on the slowed flow of water for agriculture and energy (hydroelectric power); and the Pilot integrated ecosystem assessment which was undertaken in Bugesera are key of the commissioned studies under PEI. Inspired by the millennium assessment (MA), the Bugesera pilot highlighted how the poor depend on natural resources, and how environmental disasters like drought had worsened their plight.

2. Developing tools to support mainstreaming of environment in development processes, particularly, the EDPRS - guidelines for mainstreaming environment, which are, however, yet to be tested or agreed with stakeholders; and the set of PE indicators developed under this report (See matrices in annex).

2.5 Existing Data, its Quality and Data Collection Systems

Presently, the main sources of data for PE indicators monitoring include:

1. *Demographic and Health Survey (DHS)*, which gathers data on women's fertility and health and the health of their children. The most recent one was carried out in 2005 and the results released in late 2006;
2. The *Household Living Conditions Survey (HLCS)* (also known by its French acronym EICV), gathers a comprehensive set of information on a large sample of households, covering consumption, income, education, health and other dimensions. While information on PE aspects like energy, food production/ consumption are scantily included in the summary preliminary results of the HLCS 2006 provided, it was difficult to assess all the data captured and to what extent it can be disaggregated, because the detailed results could not be released;
3. *Participatory Poverty Assessment (PPA)* was undertaken to develop a comprehensive and fairly accurate poverty profile; diagnose and stratify poverty from a social, economic, cultural and spatial dimension; and to generate and evaluate the policies proposed for addressing the identified poverty concerns. The voices of the poor have not directly been captured in the ongoing EDPRS preparation but it has gone through extensive consultations at national level. It was not clear from interviews, whether at some point in the EDPRS a second PPA will be conducted. Alternatively, one can be done specifically looking at how the poor relate to the ecosystems (as was done with PPA 2 for Uganda).
4. The *Core Welfare Indicators Questionnaire (CWIQ)* collects data on households' living conditions and use of public services, and is conducted annually;
5. *Multiple Indicator Cluster Survey (MICS)* collects data on further aspects of education,

- water supply and nutrition, from a subset of the households covered in DHS;
6. *Agricultural surveys* - done annually but mainly covers crop production and marketing, with limited information about access to land, the poor's share of the agricultural production, and land degradation.
 7. The *Food Security Survey* gathers detailed information on crop production from a sub-sample of households from the sample used for the EICV.
 8. The *Public Expenditure Tracking Study (PETS)*, examines the flow of funds to various sectors. PETS is currently limited to health and education sectors but would be extended to other sectors as well.
 9. Other systems that are sector-based include:
 - a. *Health management information system (HMIS)*, which is currently being enriched with community health information;
 - b. *Education management information system (EMIS)* which covers water, sanitation and feeding in schools. It would be better if energy use was included (particularly as it relates to intensive use of firewood).
 - c. *State of environment reporting (NSOER)* is expected to be a biennial activity, in which REMA collects data, analyses and submits a comprehensive report on the current status and trends of all aspects of environment, natural resources in the country.

For most of these methodologies, available data was collected around 2000-2001 during the preparation of the PRSP. However, for some indicators, the data has been updated in the *Enquete Sur Les Indicateurs de base du Bien-etre (Quibb)* during 2003 and published in March 2004. Even with recent data sets (like the DHS III) 2005), data is disaggregated only up to provincial level, making it difficult to do detailed analysis.

Other sources of PE data include:

- UNICEF - nutrition, water and sanitation - specifically the child survival programme
- WFP - food security monitoring/ early warning systems (FEWS)

2.6 Challenges and Opportunities for developing and monitoring PE Indicators

The main bottlenecks and challenges for developing and monitoring PE indicators include:

(a) Understanding of PE issues and status of mainstreaming is still low: it was generally observed that the present understanding of PE links and how they relate to different sectors, within the EDPRS process is low. Environmental issues are only considered as cross-cutting issues (just as gender, HIV/AIDS, ICT,..) as per the guidelines provided. As a result, a few indicators are included, and most often relegated to the bottom of the log frames. And, in the situation of scaling down the indicators, there is a risk of being left out. Understandably, advocacy for the PE issues in the EDPRS process is still somewhat sluggish, partly because the process of developing tools and capacity for environmental advocacy is ongoing, but more seriously because there are too few

competent staff rallying for PE issues in sector SWGs. Nonetheless, PE links in some areas (e.g. water & sanitation and diarrhoeal diseases) are known. The MoH, for example, has recognised the need to link epidemiological data (collected in HMIS) with related socio-behavioural data to be collected through community surveys. This will assist to link disease prevalence with underlying causes such as access to sanitation and safe water and behavioural practices.

(b) Decentralised entities not adequately if engaged: In the preliminary review, the consultants noted that issues related to decentralisation have only been lightly touched, in the entire EDPRS process, particularly from the sectoral perspective. Yet under the new decentralised service delivery dispensation, local government structures are expected to be the main framework for monitoring EDPRS, as they are close to the population. It is proposed that additional time and resources be set aside to review existing M&E in local governments, and how PE indicators are being considered (or can be included) in the M&E framework and specifically, environmental mainstreaming.

(c) Data availability: it was observed that data on PE indicators are generally limited. Most of existing indicators are on social and economic aspects of poverty, and would need matching environmental data to analyse the links. The main reason is that generally, use of indicators is relatively new in Rwanda and environmental monitoring is even more recent. PE indicator datasets can, however, be constructed from existing data collection systems. Because of lack of data and adequate standardised data collection systems, there are concerns for:

- credibility and integrity - having multiple sources that are not harmonised - making the whole analytical and reporting process liable to manipulation or difficult to comprehend;
- Geographical and temporal scale - to what extent and at what level are indicators expected to be gathered or analysed?

Where recent data is available (e.g. DHS 2005), it is highly aggregated to provincial and national level, yet it is proposed that the main focal point for PE data collection and analysis is the district where key actions are taken. Moreover, it would seem that most SWGs in the EDPRS are focussing on developing indicators in log frames, but the thinking about data and analytical work, which are critical aspects of M&E systems, has yet to be given sufficient priority.

(d) Weak institutional linkages - intersectoral coordination is only emerging, as the SWGs framework under the EDPRS has attempted to bring sectors together rather loosely. There is limited engagement of sub-national and grassroots based stakeholders - voice of the poor who depend on environmental resources and are affected by the intervention outcomes. Yet PE indicators, by their nature, require integrated planning and joint action at all levels. Weak institutional mechanisms or sector interactions make it difficult for dialogue and to appreciate the interrelationship of PE issues.

(f) Institutional capacity for PE management is still weak- In most institutions, technical capacity is lacking - not only in local governments but also in sector ministries. For instance, MoH has no Nutrition professionals and has fewer environmental health experts, who would help analyse the PE links e.g. feeding (child diets) and school attendance or learning abilities. The fact that there are no professionals with analytical abilities in environmental statistics, either at REMA or the Institute of Statistics, later on MINITERE, is of grave concern that could undermine

the process of monitoring PE indicators.

Main opportunities

Amidst enormous challenges, there are plenty of opportunities for inclusion of PE issues:

- *The Ministry of Health has established a Community Health Management System where community health information will be collected regularly at household and community level, and linked to the formal Health Management Information System (HMIS).* HMIS captures data collected from health centres. Community data level essentially covers PE issues like nutrition, water and sanitation, behavioural change in hygiene practices, that underly the prevalence of diseases.
- *Emerging initiatives in data collection and monitoring among some decentralised entities:* a number of local government initiatives in socioeconomic databases are supported by donors - UNICEF is supporting western districts of Ngororero and Rubavu and Eastern Province districts of Bugesera and Ngoma. The Eastern districts have already collected data and were in analytical phase as of mid February 2007. The data collection process is a comprehensive one involving all households and multi-level analysis (i.e. at cell, sector and district levels). It is also planned that the results from the Eastern province survey will be used to improve the data collection instruments (questionnaire) before the surveys take off in the Western province. GTZ is also supporting some districts in the Eastern Province to develop poverty profiles and build socioeconomic databases.
- *Rwanda has started to prepare a biennial National State of Environment Report (NSOER),* which, it is expected, will follow the framework of the African Environment Outlook (AEO). The AEO format requires analytical and reporting to focus on the links between environment, poverty and development, in a pressure-state-impact-response approach.
- *Joint programming initiatives among UN agencies could facilitate institutional coordination or offer lessons for the needed sectoral integration:* Everyone talked to seem to appreciate that sectoral integration in programming and resource allocation for PE issues, is likely to be a problem. But the move towards joint programming and action by UN agencies in Rwanda (UNICEF, FAO, WHO, WFP,..) could offer interesting lessons to learn from (after all, like UN agencies, Ministries are under the umbrella of one Government). Besides, there is opportunity for technical support of inter-sectoral coordination task teams (or committees) if they are formed.
- *Rwanda's PE mainstreaming agenda is public sector-driven,* unlike some other countries where the process tends to be driven by donors and civil society. This is a particularly positive attribute considering the importance of political will in environmental mainstreaming. The fact that the GoR institutions are spearheading the process, even though donor dominance in the EDPRS SWGs was visible in some sectors, is a statement of serious commitment. What is really needed are strong coordination mechanisms, consistent and sustained capacity building support, as well as enhanced mobilisation to ensure active participation of non state actors.

3.0 Applying PE Indicators: Lessons from International practice

PE issues emerged on the international scene, championed by the World Bank, the UNDP, European Commission and the DFID. The realisation that environmental degradation was actually harming the poor, yet they were not necessarily responsible for degradation, provided a strong motivation.

In Uganda, DFID tested the generic PE indicators earlier developed by a panel of experts, and most of them were found to be locally applicable. The second participatory poverty assessment (UPPAP II) that followed on these PE indicators, created opportunity to understand directly from the poor, how their livelihoods depend on environmental resources, and how environmental degradation was impacting on them. As a result, the findings on the PE links documented in UPPAP II were then incorporated in the revision of the Poverty eradication action plan (PEAP III 2004). All stakeholders, including civil society and private sector actively participated in the discussions of PE issues. It is observed, however, that while good progress has been made in some areas such as water and sanitation and health, there is slow progress in some and even reversal in others, e.g. access to and sustainable management of land, afforestation and protection of forest resources, wetlands and range pastoralism. There has been slow progress in incorporating the results of PE monitoring, and some targets have actually been reversed. And, environmental issues in many sectoral activities and local government projects are yet to get funding and sufficient attention, partly because the Environmental Liaison Units created with support from a World Bank capacity Building project, did not work as expected.

In Nigeria, a generic set of PE indicators developed by the World Bank was reviewed to assess the possibility of monitoring them within the framework of existing data. For most indicators, particularly poverty-health indicators, they could be measured/ monitored with available datasets.

In Tanzania, PE mainstreaming into the PRSP (the MKUKUTA) was done through a comprehensive process. PE indicators were developed over a long process involving detailed consultations across the national and grassroots spectrum.

A number of interesting lessons for Rwanda can be drawn in this regard:

- *participatory poverty assessments* ought to be a continuous process and not a one-occasion activity, so as to create a mechanism for direct contact with the poor - very often the progress reports from districts did not capture many of findings at grassroots levels. But for the PPA programme to be established under a long term structure (e.g. a Secretariat in MINECOFIN), would require considerable funding commitments from Government and donors, and clear links with relevant institutions such as the National Institute of Statistics.
- *Strong environmental information system and data depository* - a culture of knowledge management must be cultivated or the system won't be useful. In Uganda, large environmental datasets and well analysed environmental information had been developed at national and district levels, through the National Environmental Action Plan (NEAP) process that had started since 1992; district environmental profiles had also been developed, allowing for

sub-national environmental data to be easily collected and analysed to inform the local government planning. Without adequate and reliable data, it's difficult to analyse and report on PE indicators even if analytical skills were to be in place.

- *Participation of some non state actors like private sector needs substantial efforts in raising awareness, training and providing incentives* (could be subsidies, but also enforcement of regulations like IEAs). A strong functional regulatory system is important, as is a coordination system that keeps them engaged.
- *Some coordination mechanisms like focal points, champions..., may not work.* Very often the environmental work is perceived as “extra work or burden”, the focal points may not have significant influence either due to the positions they hold or being too occupied with their primary duties, of which they tend to draw differences. Creating task teams within sectors or ministries of 3-5 members, one of whom is assigned a coordination role would be more practical, as the institutional voice is amplified and are able to spur policy discussions and impact at sectoral level. However, for this to work there must be personnel commitment, leadership support and adequate and sustained budget resources.
- *It is not enough to include PE indicators in planning and budget priorities.* Actual implementation is always far more difficult, and as such, periodic reviews and follow-up actions are needed to ensure PE issues stay on top of the policy /program agenda. In this respect, public expenditure reviews (PERs) could be used to keep track of resource allocations and expenditure to environmental mainstreaming. Originally engineered by the World Bank, PERs have proved to be a key instrument in matching public investment with strategic priorities, through regular reflections on sectoral resource allocations and expenditure.

4.0 Proposed PE Indicators for Rwanda

4.1 Overview of the procedures and criteria

The choice of indicators is one of the main challenges in developing a monitoring and evaluation system, and certainly has been a daunting task for all sectors in the EDPRS M&E framework. In selecting the PE indicators proposed, the following procedure was followed:

1. *Identifying and clarifying* the PE links that distinguish PE indicators from others;
 2. *Setting the selection criteria* - the identified PE indicators, based on the clearest and locally relevant PE links were subjected to criteria suggested by Segbestam (1999) and others, viz:

- *Policy relevance*: extent of direct relevance to the EDPRS and MDG targets;
- *Measurability*: data that is amenable to measurement
- Clarity of the *linkage* between poverty and environment;
- *Sensitivity* to changes in data
- Degree of representation of priority issues;
- *Cost-effectiveness* in data collection (realistic cost);
- High *quality* and reliability (unambiguity);
- Appropriate spatial and temporal scale;
- Availability or ease of setting targets and baselines;

3. *A core list of key P-E indicators was then developed* and assessed for their policy relevance by comparing with the priority issues identified in the EDPRS SWG log frames.

4. *Categorising the indicators* - into intermediate and impact indicators and identifying data sources and data availability;

5. *Priority PE indicators and documenting*: A core set of priority indicators was then developed and baselines and targets set where data existed (see tables 3 and 4). It should be observed, in this regard, that many of the PE indicators have no baselines and targets yet, and it is expected that the responsible sector working groups (SWGs) will set the targets after identifying the baselines. For most of the PE indicators, it was recommended that studies be commissioned to identify baseline data. This is a key task that will facilitate the decision to be made by the stakeholders responsible for monitoring them.

6. *Selection of few final indicators* for inclusion into the EDPRS monitoring. A stakeholders' workshop in Gisenyi required further selection of few indicators (at most 2 impact level indicators for each sector). This is reflected in tables 5 and 6.

Identifying priority PE issues and data was done through comprehensive literature reviews and interviews with key personnel in Ministries/ agencies and participating donor agencies. The consultants also attended some SWG meetings to assess how PE issues and indicators were being treated in the priority setting process.

4.2 PE Indicators (Matrices & tabular formats)

The main PE indicators proposed for Rwanda under and beyond the EDPRS are presented, in 3 broad categories i.e. livelihoods, health and vulnerability (see attached tables 3&4) in Annex). The indicators are presented in a logical framework approach - with impact indicators, tracked down to outcomes, outputs and inputs.

We include a particular unique indicator on *off-farm youth employment in rural areas* for a number of arguments - rural youth are generally landless and eke their livelihoods on environment outside agriculture - tile and brick making, sand mining, trade in agro-produce, crafts, etc. Secondly, they have proven potential in environmental protection (or exploitation) activities where they earn a livelihood - massive terracing and tree planting of hillsides through food-for-work or cash arrangements, design and distribution of improved stoves, and water/ marine transport (across the Kivu) among others. As labour is a key factor for food security among landless poor households, presence of able-bodied young people and their ability to find work, is critical for food security. Rural youth unemployment is also reportedly fueling rural-urban migration, which escalates the development of slum areas. Studies have also linked lack of housing for youth (due to increasing shortage of construction materials) to inability to marry and exercise freedom and independence from parents. These are increasingly important issues in Rwanda's PE nexus that need to be tracked.

4.3 Summary of Key performance targets and levels of monitoring

1. *Baseline values* - for most indicators, there is need to set clear baselines so that progress is measured against an established baseline. Some SWG log frames have stated baselines for 2006, but it was observed that very often they are set arbitrarily and with no baseline data.

2. *Thresholds and targets* - setting targets is especially important if the indicator is used to monitor improvements in the condition e.g. reduced mortality from 30% to 5%, or reduced pollution. Performance targets are based on the propositions in the EDPRS SWGs, where the PE indicators match with the sector indicators set in the log frames.

3. *Scale of monitoring*: the GoR's strategy is that EDPRS monitoring will be centred at the district level. Data collection systems should, however, allow flexibility to disaggregate to lower levels (sector, cell) which can help districts target their responses. Also, it should be easy to aggregate to get the national picture.

5.0 The EDPRS and Beyond: Proposed Strategy for Monitoring PE Indicators

5.1 General

Inclusion of the PE indicators in the EDPRS has potential for support at all levels. While the lessons from the PRSP I and the ongoing EDPRS process offer enormous opportunity, successful mainstreaming of PE issues into the EDPRS and other development programs will require considerable efforts in policy analysis, advocacy, capacity building support, and a mechanism for effective and continuous monitoring and engagement of actors. Based on the analysis of the challenges above and the aspirations of REMA, we propose that the strategy should entail the following:

5.2 Ensuring that Poverty-Environment Issues are prioritized

In the entire process, the most daunting task will be to convince the main actors in sector ministries/ agencies and decentralized levels (including local governments and community level development agencies) to appreciate and include PE issues as a priority. Three main actions are proposed:

- *First, address PE knowledge gaps- increase the understanding of PE issues and the links:* REMA (and UNDP/UNEP) should organize a training and sensitization program for policy makers, technical and research professionals, and development workers to raise awareness and understanding of and knowledge about the PE issues and their links to poverty and development. We stress that it will not be enough to provide guidelines, regulations, indicators, etc, as these are likely to be shelved if those supposed to use tools do not understand the PE issues. Moreover, possibilities for re-prioritization and downscaling of M&E activities (usually driven by budget constraints) could emerge and critical PE indicators may thus be promptly dropped. The challenge in this regard, however, is how fast REMA can develop its own capacity to facilitate and coordinate environmental capacity building for other agencies. It is prudent to start with key sectors of health, Agriculture, water and sanitation, industry and commerce, and infrastructure, as well as support agencies like the National Statistics Institute - at both national and decentralized levels.
- *Then, work on generating interest in PE issues across sectors,* - having raised understanding of PE among sectoral technocrats and policy makers, it will be important to embark on advocacy to generate real interest in PE issues and influence the sectors to pay attention to PE indicators in their respective sectoral log frames and budgets.
- *Establish mechanisms to work through and with sectoral experts* - PE issues are better understood if they are presented or reported in a particular sectoral “language” and by insiders not entities perceived to be “external” such as REMA. It is proposed, in this respect, that environmental focal points (individuals or units) be established, but with careful innovation, as the experience with Uganda’s liaison units³, shows. Appropriate incentives (e.g. project support for aspects not funded by sectoral budgets, show-casing best practices,..) should also be considered.

³ In a bid to mainstream environmental issues into different sectors, Uganda established Environmental Liaison Units (ELUs) in different ministries and agencies and in private sector agencies. These ELUs were to act as a link between the National Environment Management Authority (NEMA) and the respective ministries/ agencies in matters of environment. They were trained and were expected to be subject matter specialists to help sectors / ministries understand and incorporate environmental issues. These ELUs were, however, not effective for a number of reasons: they had no budgets; their environmental roles were perceived to be different from those of environment and thus there were often conflict; most of them were not between their key technocrats in lower positions and could not influence sectoral policy with environmental mainstreaming messages. These ELUs were supported under the World Bank funded Environmental Management Capacity Building Project (EMCBP).

5.3 Generating adequate and relevant PE data

To showcase evidence of PE links, and to enable monitoring of PE indicators, there is need to generate adequate and reliable data, and, as PE issues need to be analysed to sufficient spatial and temporal detail, collecting data at the lowest level possible is important.

For most of the poverty indicators, data is available or can be collected within existing data collection systems. However, environmental data is generally not available and because of this, analysing the PE links is difficult. The option of collecting data within existing M&E frameworks will require review of the instruments to include core questions that generate appropriate environmental data.

In developing and analysing data, it is imperative to *collect and analyse PE data locally*: Rwandan poverty and environment issues manifest a great deal of diversity in different areas, so that an indicator (say on access to safe water) is defined differently in different areas (i.e. use different parameters - distance, time taken, availability,..). It is, therefore necessary to ensure that critical details that show local uniqueness of PE issues are not overlooked or lost in aggregation. It is suggested that a district be used as the main level of data collection and analysis for PE indicators. Data or partially analysed results can then be standardized and aggregated after district level analysis, to show provincial or national picture.

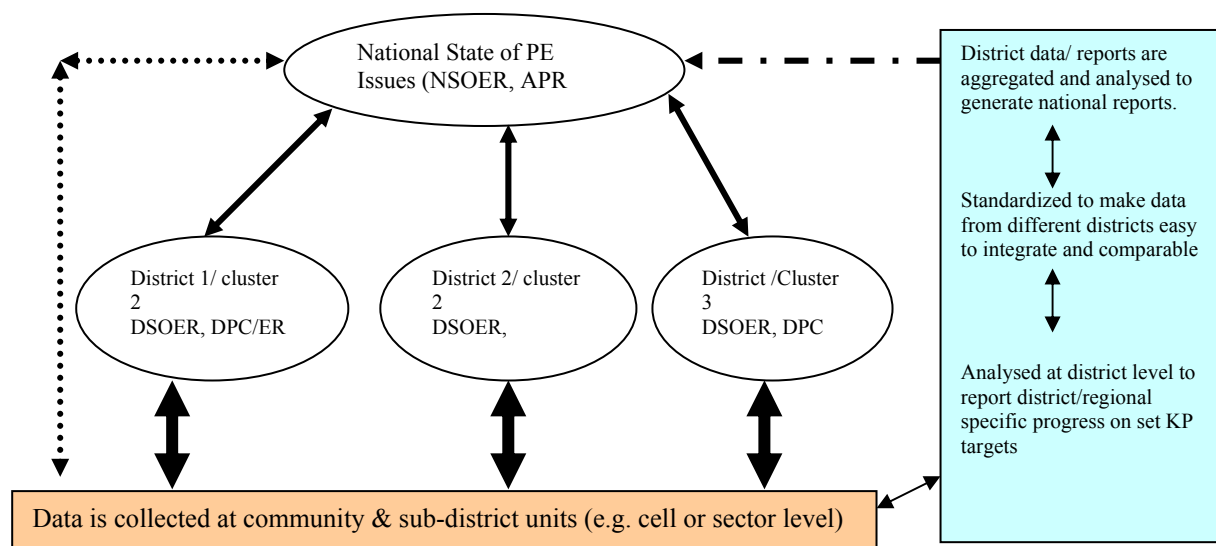


Figure 1: Illustration of Data Collection & Analysis Framework for PE Indicators

The State of Environment reporting (i.e. biennial National and District State of environment reports (NSOER & DSOER respectively) are one typical reporting system for which analytical framework suggested above perfectly suitable.

If for a certain survey or set of information, certain districts are similar, they can be grouped into clusters. It might help to use existing demarcations e.g. Provinces and urban areas but for PE issues, agro-ecological zones, or milk basins developed by MINAGRI can be used, depending on the PE issues to be analysed.

District based data collection systems are likely to be effective and more suitable for Rwanda because the national level institutions lack data and most interventions in environment and poverty reduction (e.g. safe water provision, ...) have been delivered by area-based projects whose records are rarely available in the ministries. Beyond the normal surveys and other data collection and reporting systems, there is need to commission specific studies to generate data that can enable analysis and demonstration of evidence of PE links.

5.4 Developing capacity for PE Analysis and reporting

Poverty-environment indicators are being developed:

- (a) as a basis for analysis of the impact of environmental changes on poverty (i.e. livelihoods, health and vulnerability of poor people);
- (b) to inform and improve pro-poor and pro-environment policy making (i.e. as tools for mainstreaming poverty-environment links); and
- (c) to educate and inform the public - to increase the level of awareness .

Analysis of PE indicators will mainly include: correlations and trends. Statistical analyses like calculating correlation coefficients to determine how progressive changes in certain factors (e.g. sanitation and safe water provision have impacted on the prevalence of water borne diseases), will involve use of statistical techniques like multiple regression, which demand expertise that is not available in most sector ministries.

Within the framework of developing M&E capacity for the EDPRS, PE-specific capacity building will be needed. Such interventions should cover the entire M&E framework, but particularly data collection and integration; descriptive and relational analyses, and reporting techniques. It should cover not only personnel and skills, but the entire institutional infrastructure for data collection, storage, analysis and reporting. In addition to targeting central and local governments, independent institutions (research institutions, civil society organizations,..) and informal groups at local level, should be targeted with capacity building.

5.5 Dissemination and follow-up actions

Lessons from PRSP I have shown that the APRs were not effective, partly because they had limited circulation and had no clear targets. There is need to first identifying who we want to influence with the PE information and why, and then think about how effectively the information can be provided (simple, reliable, messages) to enable them take the needed action. In this context, serious thought on the following should guide the dissemination strategy:

Influencing policy level actors: At central level, target the policy makers in the key ministries and specialized agencies (e.g. RBS, CEPEX, NSIR, ISAR, CDF, NDIS,...) through their sector policies, strategy papers and budgets, project support manuals as well as the M&E tools (being developed under the EDPRS). For ministries responsible for budget and macroeconomic policy management (MINECOFIN), focus should be on influencing tools as MTEFs, decentralized planning guidelines, and national integrated M&E systems. For donors, there is need to influence the country support/cooperation strategies which are their main guiding framework for supporting/ engaging

Government and other local partners. Some agencies such as the European Union have already started initiatives to include poverty-environment indicators in their support programmes⁴ and REMA/UNDP/UNEP should, through the PEI, find ways of building synergies with such initiatives.

Disseminating PE information at local level: With local governments and communities, a synthesis of main PE messages on actions undertaken at local level and the resulting changes can be made in simple, understandable language - highlighting good practices and drawing comparisons with what happens elsewhere. Community structures - such as *Umuganda* (monthly community service) can be used as important forums to disseminate such information. To popularize PE messages, concerned authorities (essentially MINALOC) can be approached to make specific PE issues a theme for particular *Umuganda* sessions (e.g. one month which is particularly known for malaria can be chosen for cleaning around drainages and bushes, or target cholera through better sanitation and waste management, nutrition,..). These should be inspired by what has worked at local level, elsewhere within or outside Rwanda. At the district level, messages should target the DDP (and possibly the District performance contract) - around within all interventions are expected to work.

Messages for the private sector (industrialists, traders, infrastructure developers, artisans/ *Abanyabukoriki*,..) could revolve around what they stand to gain or lose and how it affects the poor through practices such as pollution prevention, sustainable use of natural resources (like rattan), or blocking drainable systems with improper disposal of solid waste. Again, evidence-based messages showcasing where poverty trends indicate decline due to improvements in environment indicators, are important.

5.6 Institutional Arrangements for effective engagement of relevant stakeholders

Monitoring each of the PE indicators identified involves more than one ministry/ agency. It is therefore important to take a holistic or multi-sectoral approach to data collection, analysis and communicating results. However, the policy messages should be tailored to specific decision makers - so that they feel directly responsible. Each of the key institutions and sectors has a role to play - and the strategy and level of engagement is not the same for all interest groups. It is thus important to categorise them:

1. Sectoral Ministries and agencies, particularly poverty-focussed sectors, have the ultimate responsibility for monitoring the PE indicators. It is also important to consider the macroeconomic framework (planning, budget allocations,..) and decentralised governance structures in which the monitoring of PE indicators is expected to be. The key sector ministries and institutions involved that should be co-opted on a technical committee are presented, by PE issues in the table below.

⁴ The EU commissioned a poverty-environment review to identify the salient PE issues and possible options of addressing them in the Rural Development strategy for Rwanda.

Table 1: Institutional Roles in PE Monitoring

Poverty-Environment Indicators Cluster	Priority PE issues in Rwanda for which PE indicators have been developed	Key institutions involved
Poverty-Livelihoods (food security & incomes)	Agriculture & Livestock; Land access/ security of tenure & productivity/ degradation - Water for production - Access to other natural resources (forests, wetlands, biodiversity) - Rural agro-markets & infrastructures	MINAGRI, MINITERE, MINICOM, MININFRA
Poverty-health	- food (nutrition); - vectors (malaria) - access to safe water (water borne diseases, cost in terms of time & money,...) - availability & quality of energy (indoor air pollution); industrial pollution & urban waste	MINAGRI, MINITERE/ WATSAN, MININFRA
Poverty-Vulnerability	Vulnerability to drought, floods, landslides, resulting in famine, loss of property & livelihoods. - Susceptibility to livestock & human epidemic outbreaks	Social Protection (MINALOC/ Prime Minister's Office) Famine/ Drought Early Warning System (MINAGRI/ FAO/WFP) Epidemic outbreak (MoH, MINAGRI)
	Macroeconomic management & decentralised governance framework	- MINECOFIN (Budget, strategic Planning Units) - MINALOC
	Support & Coordination	Statistics, REMA,

2. Donors: the donor representatives interviewed during this study agreed that from past experiences, imposing conditionalities cannot work where there is no political will and often impacts the poor. But there was consensus that donors can influence policy because of their ability to receive audience at all levels of Government; and through targeted policy implementation support either around the budget or through project/ program financing. They also need to be influenced to support PE issues in their country cooperation strategies. Donors can for instance ensure that budget support is based on a set of agreed targets to which they can help include critical PE issues. To engage donors, however, will require well synthesised evidence-based policy messages that are based on reliable PE data. In addition, mechanisms for sharing information more widely and transparently will be needed - a web network or regular publications can be considered (see proposed dissemination strategy below).

Some donor agencies (the World Food Programme, FAO,...) have developed specialised databases and monitoring systems for PE related issues e.g. food security, drought monitoring and early warning systems. A mechanism to integrate these systems into the PE monitoring framework under the EDPRS is considered vital and should be explored.

3. Civil society and international development agencies: international civil society organisations such as Care International, WWF, International Gorilla Conservation Programme (IGCP), etc., have demonstrated increasing interest in poverty-environment issues - and are implementing programmes in poverty, environment and development. Because of Rwandan's strategic position, a number of these programmes exist or there is potential to work with them - in generating data and undertaking complex analyses. Their experience in international advocacy and the

specialised expertise at their disposal can benefit Rwanda in various ways - e.g. training ministry and local government personnel, advocacy and networking to influence budget and planning processes, and sharing PE information locally and internationally. In this regard, the contribution of WWF in building capacity for environmental monitoring in Tanzania's PRS (MKUKUTA)⁵ can provide an interesting lesson.

4. Local Governments and decentralised entities: the role of decentralised entities in PE monitoring needs to be underscored as the GoR has now prioritised decentralisation as the main mechanism for delivering on its poverty reduction, good governance and socioeconomic transformation objectives. The District Development Plan (DDP) is expected to mirror the EDPRS at local level, with implementation activities and corresponding resources provided to and managed at that level. Equally, the Local Government structure has been reviewed and technical personnel placed at sector level, with elected leadership up to village (*Umudugudu*) level. With this administrative machinery, it should be possible to collect adequate and fairly accurate data more cost-effectively. However, as PE data is very complex, precautions are needed to assure the quality of data collected at local levels. Training of local level data collectors, provision of incentives to enable them do a good job, and regular follow-up and triangulation of information collected, is proposed to enhance the integrity of locally collected PE data.

5. The Private sector - a critical non state actor in the P-E issue are the private sector, yet their capacity and current level of interest and engagement in the EDPRS is weak, and this is partly due to their weak institutional capacity. As a sector lined up by the GoR to be the driver of the anticipated economic growth, there is potential for environmental damage (or improvement) with respective consequences or benefits to the poor, depending on what extent environment sustainability issues are given priority.

6. Community and local level actors: We consider this level to include households and individuals in the community - but also formal and informal institutions operating at local level (cooperatives, associations,...), civil society groups (including faith and community based organisations,...) and external NGOs and other entities operating at that level. As the ultimate level at which poverty and environment interaction occurs, it is vital to put in place mechanisms to engage these actors - not just through irregular surveys and data collection activities where feed back rarely occurs. They need to understand the PE links and how they affect them, and be given opportunity (or responsibility) to participate in monitoring progress. Participatory poverty assessments (PPAs) have proved to be an effective technique to hear the poor's own "voice" but were limited because of lack of feedback. There are also emerging techniques - such as the citizen report cards (CRCs) where the population report on their satisfaction with services. A mechanism to encourage participatory monitoring, where feed back is done at the local level, and debate is generated with the local communities and used to inform policy, should be considered. Luckily, decentralisation has created a framework for empowering the people and enabling them to participate in monitoring development programs. This is where the PE links are most visible. Involving communities in monitoring is, however, a tedious and costly process, therefore careful planning will be needed, particularly on what specific indicators should be monitored at that level.

⁵ In Tanzania, WWF International run training workshops for local government personnel to develop their understanding of the poverty-environment priorities in the MKUKUTA and how they could align their district plans & budgets to reflect these priorities. And, in partnership with Tanzania Natural Resources Forum, a local organisation, WWF organised training for CBOs to enable them effectively hold the Government accountable in the implementation of the MKUKUTA.

7. Involving the Press: - Use the media to disseminate some of the messages - its cost- effective but incentives are very often needed because the media is always interested in stories that make headlines and not necessarily educative. A partnership framework that includes support to training, award or public recognition can interest media houses, particularly targeting those that reach the rural poor.

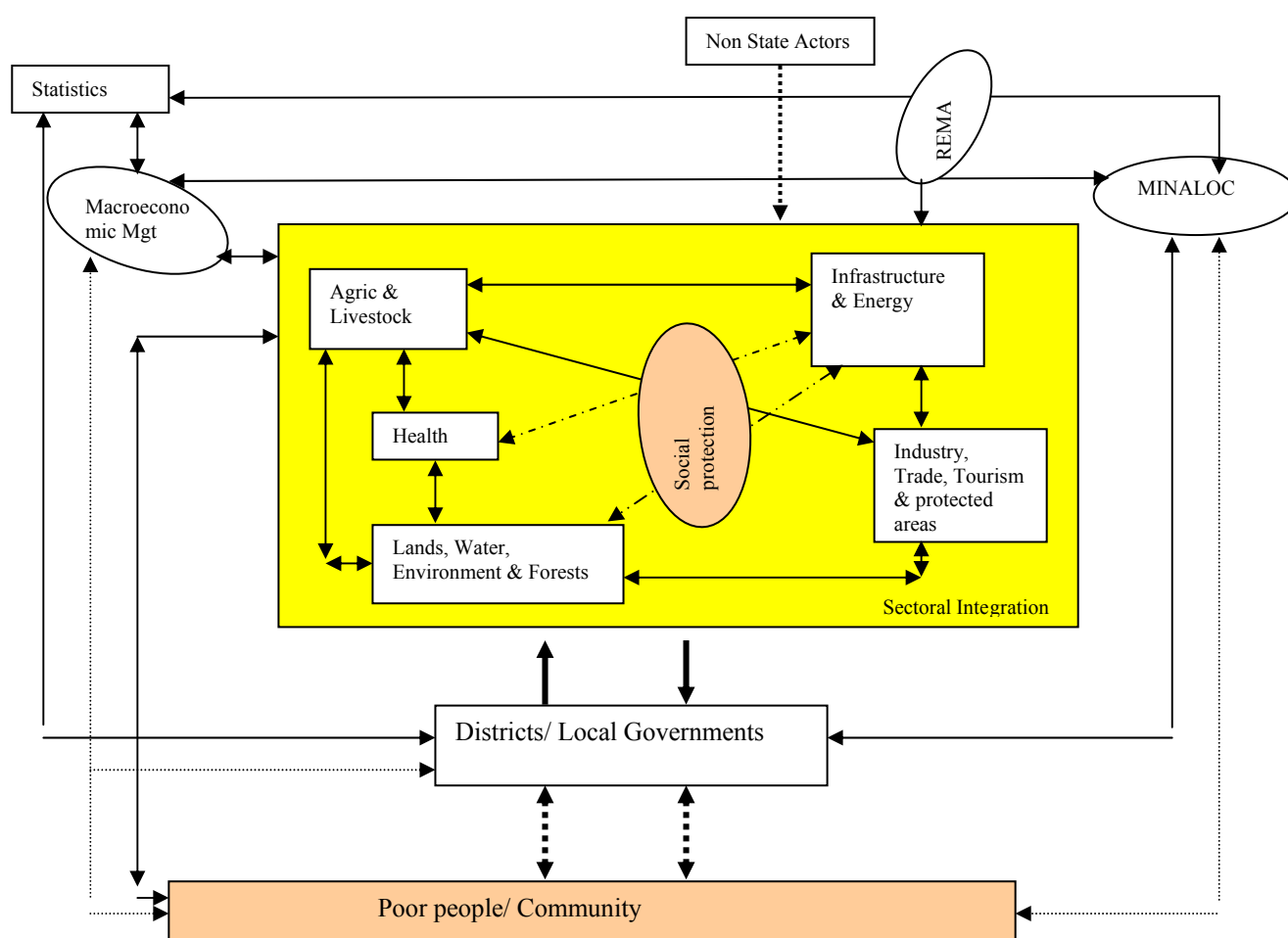
Monitoring PE indicators also has implications:

- *On budget* - ultimately, to improve the quality of data collection, analysis and reporting, more resources will be required at all levels, particularly the district and local level where more activities are expected.
- *On institutional coordination* - even for the same indicators, data collection systems are different. Water in urban areas is, for instance, a responsibility of Electrogaz and in terms of policy, under MININFRA, while rural water supply is under the Water and Sanitation Unit of MINITERE. Without these institutions being coordinated, it might be difficult to get uniform and comparable data for monitoring. It will be useful to agree on specific datasets and how to collect the data. Where joint reviews are considered, articulation of functions and allocation of personnel responsible for PE follow-up should be done through higher authorities - e.g. the set-up (and membership to) inter-sectoral committees, will require a strong administrative instrument if it's to be recognized and supported by concerned institutions.

5.7 Institutional/ Sectoral Coordination framework

An appropriate coordination framework is needed not only for data collection but also for analytical work and information dissemination. The National Institute of Statistics (NSIR) is, in our view, more competent and appropriately positioned to coordinate data collection, analysis and interpretation of environmental statistics. REMA on the other hand, should be mandated (and empowered to analyse environmental policy) - since the ministry (MINITERE) has other sectoral responsibilities (lands, forests, water,..). Besides, REMA is, by law, a regulatory agency that crosscuts government functions.

Fig. 2: Institutional Framework for Partnership and Coordination in PE Monitoring.



5.8 Suggested Reporting and Dissemination techniques

Considering the purpose and targeted audience of the PE reporting, it is recommended that the mode of reporting and dissemination be as follows:

- text and graphics - to make them attractive
- numbers and figures - presented in tabular formats and in text statements help build the case for the links between poverty, environment, poverty and growth
- summaries - synthesise messages
- use comparisons- making comparisons between areas (districts,..) in terms of progress, requires. But is important that the phenomena or areas being compared have similar circumstances/ conditions to be relevant.

Table 2: Example of indicator reporting format based on aggregation from district to national level

	Indicator(s)	Performance Target & Status			Comment(s)
		District 1	District 2	District 3	
1					
2					
3					
4					
5					

5.9 Suggested Implementation Framework/ modality

It should be emphasised that the process of collecting, analysing data and disseminating the resultant information is a costly task requiring enormous financial resources and technical expertise, which are currently unavailable. The fact that PE data and its monitoring are a generally new concept, presents further dilemma. This study, therefore, proposes that the selected PE indicators be monitored in a phased implementation approach. Nonetheless, in selection of the key indicators to start with, all key sectors in the PE nexus (i.e. agriculture & livestock; health; industry & tourism; lands, water & sanitation) should be covered.

5.10 What Actions are needed to make the strategy work?

PE monitoring in Rwanda will be possible if proper baselines are established and realistic targets set, if reliable data is collected regularly and consistently, if competent personnel are recruited, trained and retained, and if institutional facilities are developed to collect, analyse and report on indicators, and if a framework for coordination and building synergies is put in place. Thus, for the proposed PE monitoring strategy to work during and beyond the EDPRS, the GoR and partners should consider the following:

1. *Start with a few, easy to monitor PE Indicators*, and scale-up progressively as institutional capacity, awareness and interest increase. For a start, although indoor air pollution is a critical PE indicator associated with quality of energy and technology for cooking, resulting in high incidences of respiratory tract infections (RTI), it will be difficult to monitor at the start. This is because there is currently no data, and its collection will need sophisticated equipment and training of personnel which takes time.
2. *Field-test the PE indicators* - so as to identify which ones are more relevant than others where; which ones are easier to collect and analyse at different levels, and develop an approach for progressively scaling up the number of PE indicators as human and institutional capacity increases, and to cater for emerging policy interests. Ensure that the field trial of the PE Indicators is a joint exercise, which also provides opportunity to try the institutional collaboration arrangement across local and national levels. Given the gaps, it is suggested that PE indicators should be tested using both secondary and primary data. The choice of sample indicators should take into consideration the 3 broad PE indicator categories (livelihoods, health

and vulnerability), and the selection of test sites should consider the diverse biophysical and socioeconomic features.

3. *Commission in-depth surveys and analytical studies to establish baseline data* and information on the status of the proposed PE indicators but especially table 5. It is on this basis that realistic targets will be set for the EDPRS in the context of the MDGs. Considering the scanty availability of secondary data, comprehensive studies that logically combine secondary and primary data collection and detailed analytical work (on PE links) are required. These studies should benefit from ongoing initiatives (e.g. district databases).
4. *Establish pilot demonstration projects to generate field evidence about PE links and experience on what might/might not work* - focus on PE aspects where links are clear and where the locals are motivated to participate, to generate evidence that improvement in environmental quality can reduce poverty. In the process, such micro-projects would also help build the capacity of sectoral ministries, local government and community institutions involved, to better respond to the complex issues in the PE nexus. It is thus advisable to identify the most pressing issues in the selected locality e.g. agricultural improvement where there is chronic food insecurity; indoor air pollution (improved stoves) where energy crisis is known; and water and sanitation where prevalence of water-borne diseases is locally recognised as a big problem. Where relevant interventions exist (e.g. the millennium villages project), it may be prudent to draw from those instead of starting new projects.
5. *Environmental education and awareness raising* - targeting all levels - from top policy makers and politicians, local governments, private sector agencies and civil society groups down to local communities. At higher levels, a compilation of facts and figures on PE links in Rwanda into simple booklets should be considered. At local level, support to network of environmental clubs and advocacy groups/initiatives (WATSAN Associations in schools & communities, debates); greening micro-projects that target poverty reduction, etc., could be developed and disseminated. PE awareness raising materials will be effective if they are designed and packaged in simple understandable messages, if they contain evidence from Rwanda with clear PE links, and are consistent in the messages portrayed.
6. *Implement participatory PE mapping* - although the ongoing EDPRS seems more participatory than the previous one, there has been no opportunity to hear the voices of the people, as was the case with participatory poverty assessment (PPA). Yet, capturing voices of the poor is essential for monitoring PE indicators. Inclusion of the local specific issues requires data collection and monitoring systems that directly involve local people. Lessons from the 1999/2000 PPA which clearly mapped the poverty categories, their resources and vulnerabilities can be insightful. With regard to analysing PE issues, Uganda's UPPAP III which focussed on poverty and natural resources, provide useful lessons on how to design an appropriate methodology for engaging grassroots communities.
7. *Establish a competent policy analysis group* above the EDPRS - to provide overarching policy leadership. Because PE links require sophisticated policy analysis, key actors at higher levels need to be clear of the policy links and cross-sectoral issues. A synthesis at the highest level should defuse down and provide policy guidance to selection of sectoral priorities, further down to operational level in districts. The National Institute of Statistics (NSIR), MINECOFIN, and the recently established Policy Analysis Institute, should, in this respect, be targeted for PE capacity building support and advocacy.

8. *Make use of GIS technology - consider using poverty-environment maps* - poverty-environment issues manifest spatial and temporal features - they are location and time-specific. Geo-referenced information (in form of PE maps) is thus an important tool in monitoring and reporting on PE indicators. With PE maps, the complexity of PE indicators will be simplified by the powerful feature of visualisation that the GIS technology possesses. The other advantage with PE maps is that it has been piloted already and found to be a relevant and effective tool in Rwanda, if only it is followed through. There are, however, implications for capacity in PE analysis and reporting, which have to be addressed.
9. *Take advantage of ICT in disseminating and sharing PE information*- Web-based information sharing frameworks (e.g. regular report bulletins on progress with PE indicators) can help share info with many stakeholders, more conveniently and more cost-effectively. Lessons from Landnet (a web-based land information supported by DFID), which provided a good and effective forum to seek and receive feedback and interesting ideas on key land tenure reform issues, should be reviewed and adopted. But be sensitive to the limitations of ICT, especially given the still weak web infrastructure in Rwanda.
10. *Include in the EDPRS monitoring framework, regular conduct of public expenditure reviews (PER) for environment*. The argument here, from experience of Rwanda's budget framework, financial allocations to planning and PE monitoring will be minimal. Budget deficits are likely to arise, which might result in inevitable relegation of PE issues to the bottom, if considered at all. In such situations, the PE indicators included will not be useful if no funds are provided for monitoring or if they are knocked off the priority list.
11. *Consider institutional partnerships/ joint M&E with relevant institutions* - this is critical considering that PE indicators are relational and their analysis inherently cross-sectoral. In this respect, a core committee comprising of key sectors, e.g. the National Statistics Institute and REMA, is proposed to plan, guide and oversee the PE analytical work and information dissemination. But clear terms of reference backed by a strong administrative instrument and budgetary facilitation, are needed. Table 1 suggests the functional units within ministries/ sectors that could be co-opted on the committee.
12. *Establish a Knowledge management centre* - Knowledge management and learning are critical aspects of any M&E system. And for PE issues in Rwanda, the serious lack of environmental information which has been acknowledged widely makes it all the more difficult. REMA should be supported to establish an environmental information and resource centre (a physical library and possibly an electronic one) where a collection of environmental information including research materials, reports and policy statements on energy, agriculture, industry, population, governance, environmental health, etc., can be found. It is inconceivable to think about generating data and establishing databases, only for it to be synthesised into reports that cannot be easily accessed later on read.
13. *Develop a detailed index of PE indicators* - a directory with detailed definition/ explanation of each PE indicator, its relevance to policy and link to poverty and environment, sensitivity to equity, and the details of calculation/ measurement, etc, should be developed to guide policy makers and planners, and analysts who will be involved in PE monitoring.

6.0 Concluding Observations, Anticipated Challenges and Way forward

6.1 Concluding Observations

1. There is appreciation that PE indicators are needed, and our observation is that the process of mainstreaming environment into the EDPRS should be at advocacy levels, where sectors are influenced with the tools and the evidence of links before the final log frames are developed.
2. Awareness and understanding of PE links and how to monitor them at sectoral level, is as critical a limitation as data availability. It would seem that raising awareness at sector level, generating sufficient and reliable data, then developing capacity for monitoring and using the information generated to inform the policy process, will be the most immediate and challenging tasks.
3. It is important to appreciate that the process of PE Indicator development does not stop with this set of PE indicators. Rather, this set is a working tool which is expected to be continuously reviewed and improved with practical lessons in monitoring of PE issues. We emphasise that the ultimate target of PE indicators is to help “deliver the message” (i.e. indicate changes) which should influence decision making in the relevant sectors. Indeed (as noted by Segnestam 2002), not until the required information is achieved and the decision making processes have integrated such information, can the goal of indicator development be said to have been achieved. Strong advocacy is, therefore, as important as the quality of the PE indicators themselves - and this is the challenge for REMA.

6.2 Major Challenges that remain

Institutional alignment to integrated programming: As the PE indicators matrix shows, PE monitoring transcends sectors and will require integrated programming. However, besides capacity, experience in Rwanda and elsewhere has shown that it is difficult to “think and plan integral” when ministries are organised along sectoral lines, and sector strategies drawn without strong consideration of cross-sectoral issues. Moreover, the most suitably positioned institutions to lead such integral process - MINECOFIN’s Strategic Planning Directorate and REMA are overloaded with their own institutional responsibilities, with double jeopardy imposed by capacity constraints.

Ambitious timelines: It is observed that the entire poverty-environment agenda is being driven by the EDPRS - which has a very highly ambitious roadmap. In order not to be left by the EDPRS “bus”, there has been little time to make critical reflections, take stock of what has/ hasn’t worked in the environment (*e.g. the mainstreaming agenda could have been preceded by carefully packaging and extensively disseminating the lessons from PRSP I on the dangers of not considering environment*); test and use the tools to demonstrate how its an issue to all stakeholders and not REMA or MINITERE alone. It is in this sense that a concern is raised that most of the key stakeholders (at least in the EDPRS preparation) know little about the PE links, beyond mere awareness that environment is a cross-cutting issue like HIV/AIDS or gender. Its also not clear what strategy exists to influence the sectors with the environmental mainstreaming

tools developed - meetings, workshops, trainings, lobby and advocacy,... yet time for the sectoral EDPRS deliverables appears to be up. As the process gets into the crucial costing/ budgeting phase, REMA/ PEI and whoever else is involved in environmental mainstreaming need to move faster and bolder with these tools if they are to influence the process.

Developing adequate and sustained capacity for PE data collection and monitoring- is likely to be a long and more challenging process - it involves sectoral ministries/ agencies as well as Local Government and grassroots actors. The problem is that REMA does not yet have the institutional strength to coordinate the process - yet it requires coherent and focused leadership. Enormous technical assistance is thus required more urgently but it is unlikely in the current circumstances.

Absorption limitations and the macroeconomic framework: the expected capacity building programme will be executed within set resource absorption limits partly imposed by weak capacities, which are likely to make the process slow - e.g. are there appropriate qualified personnel at district level? This also has implications on the allocative efficiency of budgets. The other issue is whether the macroeconomic framework (which sets MTEF ceilings) will impose a “cap” on financing sectoral or sub-national level activities, whether urgent capacity building needs will be exempted from such ceilings should funds be obtained? If this happens, questions still remain as to how to go round it. Thus, MINECOFIN (essentially Strategic Planning and Budget Units) should be part of the core group responsible for monitoring PE indicators.

Medium to long term policy macroeconomic context for Mainstreaming PE issues

- *the long term investment framework* - envisages intensive land use for commercial production of high value crops. The strategy is to optimise agricultural production through investing in irrigation and changing land use. But the likely impacts (loss of biodiversity, reduced water levels, loss of water use rights by smallholders,..), and it's not clear what safeguards are in place e.g. to mitigate them. What incentives are in place for resource poor farmers or small holder water users? These hard questions need to be asked and reflected in the PE indicators

Tables & Matrices of PE Indicators

Table 3: Priority Poverty-Environment Indicators for the Set EDPRS outcomes and targets

Overarching EDPRS priority related to PE	PE Key Performance Indicators at Impact level	PE Indicators at Outcome (Results) level	Output Indicator(s)	Lead Agency/ Sector for monitoring the PE indicator
a) Access to, productive use & sustainable management of land resources	a1) % of rural households with secure land tenure	% of rural land that is registered/ titled % of female & child-headed households whose land is titled	- Existence of operational land registration services at district & sector level - Sensitization meetings held on land tenure (annually)	MINITERE/ Lands
		- % of land related disputes successfully resolved	- Local leaders trained in land dispute resolution	
		- % of rural households accessing credit from financial instruments using land as collateral	- sensitization on access to credit services	
	a2) proportion of arable land that is protected from erosion	% of districts which have formulated & are implementing anti-erosion regulations & byelaws	- comprehensive land evaluation / suitability assessment report	MINITERE/ lands/ REMA
b) Forest & tree resources increased & optimally utilized		- % of hilly areas which have been terraced or under soil conservation	- % of Agricultural sector budget that is spent on soil conservation activities	
	b1) proportion of total land area under forest & tree cover	- proportion of public land set aside for forestry activities; % of forests managed through collaborative arrangements with local communities % of bare hills planted with trees	- No. of collaborative forest management agreements signed & implemented by - No. of tree nurseries established (at cell & sector level)	MINITERE/ Forestry
		- No. of biodiversity-based enterprises managed by or employing the poor	- No. of biodiversity inventories held - No. of biodiversity awareness & conservation trainings held - Proportion of tree nurseries stocked with threatened tree species per district % of farmers who have planted medicinal plant species	
	b2) Annual fuelwood consumption for as a proportion of total standing volume	% of households & industries using fuelwood as a source of energy for cooking % of Households using energy saving stoves		MINITERE/ Forestry
c) critical ecosystems conserved and contribute to improved livelihoods of the poor	c1) % of degraded wetlands rehabilitated	- Proportion of wetlands that is protected from intensive human activities - proportion of critical wetlands under intensive agricultural use - Existence & implementation of pro-poor policy & law on wetlands¹ % of local communities living around critical wetlands involved in ecotourism or recreational activities	- wetland master plan - No. of trainings in community based natural resources management % of wetlands inventoried	MINITERE/REMA

Overarching EDPRS priority related to PE	PE Key Performance Indicators at Impact level	PE Indicators at Outcome (Results) level	Output Indicator(s)	Lead Agency/ Sector for monitoring the PE indicator
	c2) Area (Ha or Sq.km) of steep hills & mountains and rangelands protected from human activities	- Area (in Ha) of bare hills planted with trees & soil stabilizing grasses - % of dry lands and steep slopes under cultivation or livestock grazing		
d) Water resources sustainably managed to enhance health and facilitate pro-poor growth	d1) % of people with access to and using safe water and sanitation	- o % of poor Households within 30 min of functional safe water source; • Per capita water use among poor households • Proportion of household income spent on water; • Average time spent by women & children collecting water	- No. of Water User Committees (WUCs) formed - % of WUCs with O&M budget - % of WUCs headed by women. - No. of functional safe water sources	MINITERE/ Water & Sanitation
		- o % of rural households with access to functional latrines - o % of urban population that are connected to sewage systems.		
	d2) % of irrigation & other water-intensive projects that have been subjected to environmental impact assessment	• In cadences of water stress • incidences of water-use conflicts • proportion of watersheds protected	- water resources master plan - existence of an inventory of water resources in Rwanda	
e) Ensure food security for all Rwandans	- % of total population who are food insecure	• annual per capita food production • land productivity (tones of food / ha/ annum) • employment & labour productivity among	- % of farmers with access to and using inorganic & organic fertilizers - % of farmers with access to and using improved seed - % of farmers practicing soil conservation technologies	MINAGRI
		- sustainable use of water for production	• use of rainwater harvesting/ water conservation technologies	
		• % Mean daily caloric availability/ intake per person		
		• trends in food prices (for selected staples in Frw/ Kg)		

Overarching EDPRS priority related to PE	PE Key Performance Indicators at Impact level	PE Indicators at Outcome (Results) level	Output Indicator(s)	Lead Agency/ Sector for monitoring the PE indicator
f) Increase in household incomes among the poor	- % increase in per capita income among rural households	Proportion of food produced that is sold to the market (by wealth quintile)		
		% of household income from agriculture & livestock (by income quintile per annum)		
		% of people with < 1 Ha of land who have regular & sustained off-farm employment		
g) Reduce malnutrition-related mortality & morbidity	Incidences of malnutrition among under-five year olds	- % of under -fives who are underweight - % of rural children under 5 years who are stunted	- o mean daily caloric availability at household level - o % of poor HHs consuming < 80% of caloric requirement (or < 2 meals a day) • % of Health care facilities with feeding program for sick & malnourished children at Health centres • No. of schools with a regular feeding program	MoH/MINAGRI
	- Incidences of water-borne diseases among under-five year olds	- Prevalence of diarrhea among under 5 year olds	- <i>E. coli</i> / 100 ml of water consumed by residents by source - % of health spending on treatment of water-borne diseases - No. of improved water sources - No. of new urban poor HHs (or areas) connected to piped water - No. of schools with a safe water facility within 100 metre radius - % of households practicing basic hygiene	MoH/ MINITERE
		% of households with access to adequate sanitation facilities	- o % of poor HHs with appropriate provisions for disposal of children's faeces - o % of people with knowledge of basic sanitation & hygiene behavior; - o % of households with hand-washing facility - o % of people with knowledge and/ or awareness about transmission of diarrhea diseases. - o pupil/ latrine stanza ration in primary schools	
h) Reduce incidences of malaria related mortality & morbidity	Incidences of malaria among women and young children	- Annual death rate from malaria among under- fives & pregnant women - % of malaria cases reported (severe & uncomplicated) - proportion of HH expenditure on malaria treatment	- % people sleeping under treated mosquito nets - % of households maintaining proper hygiene (clearing stagnant water & bushes around homesteads) - No. of HHs with at least one treated bed net - No. of environmental health education activities held	MoH

Overarching EDPRS priority related to PE	PE Key Performance Indicators at Impact level	PE Indicators at Outcome (Results) level	Output Indicator(s)	Lead Agency/ Sector for monitoring the PE indicator
i) Environmental pollution controlled through effective prevention & and Waste management mechanisms	% of people with access to waste management services in urban & rural areas	□ % of poor urban households within 200 metres of solid waste skip □ frequency of solid waste transportation in areas occupied by the poor □ % of rural households with solid waste disposal facility □ % slum areas with improved drainage systems	• Local Government budgets set aside for waste management • No. of public waste management sensitization meetings held in urban areas • Operational drainage systems in urban areas • No. of slum improvement projects implemented • No. of Public-private partnerships in solid waste management initiated & operational • % of local governments with byelaws or ordinances on solid waste management	MININFRA/REMA
	% of industries & commercial entities using cleaner production mechanisms	- o % Legal & regulatory framework for pollution control - o % of industries & other commercial entities with waste water treatment facilities - o % of industries which have undergone environmental audit	• presence of a functional Cleaner Production Centre • Trainings held on Cleaner production • presence of standards & guidelines for industrial waste • Municipal & solid waste management plans • Existence of database & monitoring plan for hazardous wastes	REMA/ MINITERE/ MINICOM
j) Reduce vulnerability to environmental disasters	% of total population who are susceptible or exposed to the risk of floods, landslides or drought	- % of people resettled from wetlands, steep hills or extremely dry rangelands	• existence of robust early warning system • Inventory/ database of Settlements in wetlands & steep hills • Existence of Resettlement plan & approved budget • No. of sensitization meetings held on environmental disasters	MININFRA/ REMA/ MINITERE
		- % of people living in substandard housing	• No. of grouped settlements (<i>imidugudu</i>) sites evaluated for environmental suitability • % of people living in slum areas	MININFRA
	Incidences of deaths, illnesses or loss/ destruction of property due to floods, landslides or drought	- No. of human deaths or injuries due to floods or landslides	• Existence of disaster preparedness plan • No. of Households who have been rendered homeless or lost property due to floods & landslides • Total value (in Frw) of property lost or destroyed by floods & landslides • % of National (or district) budget spent on disaster mitigation	MINALOC/ Prime Minister's Office

Table 4: Priority Poverty-Environment Indicators for the EDRS (Sectoral & cross-sectoral)
3.1 Poverty-Livelihoods indicators

Type of Indicator	Indicator definition	Performance measure (KPI)	Baseline 2006	Target DDP 2009	EDPRS 2011	MDGs 2015	Progress (Annual)	Source of data	Responsible
Impact (Final) Indicators	1.1 Incidences of food insecurity (chronic & seasonal)	% of people who are chronically food insecure (by sector, district,...)	20%					Food Security Survey,	WFP / MINAGRI
		% of people who have at least 2 meals a day						HCLS	NSIR
		Mean daily caloric availability at HH level per person	Kcal. 1734 ; Protein:49g Lipids: 8.8g		2100 Kcal Protein: 59g Lipids: 40g			Agric. Survey E(CV??	MINAGRI
	1.2 Incidences of malnutrition among children under-five	% of children under five who are underweight	23% R					HMIS, HLCS	MoH
		% of children under five who are stunted	14% U					DHS, HMIS	
	1.3 Incidences of malnutrition among women	% children with low birth weight	45% R					HMIS	MoH
		% of women falling below cut-off for Body Mass Index	33% U					HLCS, HMIS, DHS	NSIR/ MoH
	1.4a Household incomes among rural poor people	% of HHs' income from agriculture (by income quintile) per year	21.8%					HLCS	NSIR
		% of HH income from livestock (by income quintile)							
		Proportion of food produced that is sold to the market (by wealth quintile)							
		% of the population around protected areas with regular & sustainable income sources.							
		% of people with < 1 Ha of land who have regular & sustained non agricultural employment						Agric. Survey?? NSIR	MINAGRI, NSIR
		% of out-of-school youth (ages 15- 24 years) who have regular off-farm employment (desegregated by gender& rural/urban)						Quibb/CWIQ, HLCS	NSIR
	1.4b Household incomes among urban poor people	% of HH income spent on food by urban households (by wealth quintile) per year						HLCS, CWIQ	NSIR, MINAGRI
		% of urban population living in slum areas							MINIFRA??
Impact (Final) Indicators	Outcome: Poor people's access to land	% of rural HHs farming on < 1 Ha of land							
		% of people with secure land tenure							MINITERE
		% of female-headed Households whose land is registered/ titled							"
	Poor farmers' access to modern agro-inputs	% of farming HHs using fertilizers (modern & organic compost)	5%						
		Proportion of farming HHs using improved seeds	2%		10%			Agric Survey	MINAGRI
		% of poor farming HHs with an improved livestock (trends..)	6.2%		75%			Agric. Survey Quibb	MINAGRI, NSIR
		- % of farming HHs with food reserves						Agric. Survey	MINAGRI
		- % of livestock farmers within recommended carrying capacity threshold						"	"
		- % of farmers in drought-prone areas planting drought resistant crops						"	"
	Land productivity per ha (Metric Tones per Ha)	- % of farm land in hilly areas that is protected from erosion							MINITERE
		- production per ha of land (based on selected crops)						Agric. Survey	MINAGRI
		- Annual crop production per Ha (MT/Ha of beans, maize, sorghum, other selected crops)						Agric. Survey	MINAGRI
		- % of farmers planting on time, as advised by meteorology services or agricultural experts						Agric. Survey/ Food Security Survey	MINAGRI/ WFP

Type of Indicator	Indicator definition	Performance measure (KPI)	Baseline	Target	EDPRS 2011	MDGs 2015	Progress (2011)	Source of data	Responsible
Final Indicators	2.1 Mortality & morbidity among under 5-year olds related to WATSAN	Prevalence of diarrhea among under 5 year olds (general & among poorest quintile)	2006?	DDP 2009				DHS, HMIS	MoH, NSIR
		Prevalence of / or exposure to risk of cholera & dysentery	16%					"	"
		- % of HH income spent on treatment of diarrhea diseases						"	"
		- % of health spending on treatment of water-borne diseases						"	"
		- incidences of school absenteeism due to illness							
		- % of WATSAN budget spent on water treatment						EMIS, HLCS	MINEDUC, NSIR
	2.2 Malaria related mortality & morbidity rates	- Malaria death rate (probable & confirmed) among under- 5 year olds & pregnant women						PETS,	Electrogaz/ DEA
		- No. of malaria cases (severe & uncomplicated)							MoH
		No. of malaria cases, severe & uncomplicated (probable & confirmed)						HMIS HLCS	MoH, NSIR
		- Proportion of HH expenditure on malaria treatment						DHS, Studies	NSIR, MoH
		- Incidences of school absenteeism due to illnesses (trends)	10.6%					Quibb	NSIR
	2.3 Incidences of respiratory tract infections (RTI)	% of deaths or illnesses due to RTI among women						HMIS, DHS	MoH, NSIR
		% of deaths or illnesses due to RTI under -fives	17%					DHS	NSIR/MoH
		Prevalence of Acute Respiratory Infections (ARI)						HMIS	MoH
		Prevalence of chronic obstructive pulmonary disease (COPD) (lung disease)						"	"
	Outcome: Access to and use of safe water	- % of population with access to safe water							
		- % of HHs with access to safe water (by wealth quintile)							
		- % of poor HHs within 30 min of functional safe water source;							
		- % of rural poor HHs within 150 metres of a clean water source.							
		- Average per capita water use among poor HHs						DHS, CWIQ	
		- proportion of HH income spent on water by poor households (disaggregate by rural/ urban)						Commissioned surveys	MINITERE, MoH, NSIR
		- Average time spent by women & children collecting water							
		% of primary schools with a functional clean water facility within 100-metre radius							
Environmental	Access to basic sanitation	- % of HHs with a standard latrine within 50 metres of homestead ²	18%		68%			EDPRS APRs, DPC reports	MINITERE, MoH, MINALOC
		- % of poor HHs with appropriate provisions for disposal of children's faeces							
		- Pupil/ latrine Stance ratio in primary schools							
		% of urban poor households within 100 metres of a solid waste skip							
	Extent of hygiene behavioral practices	- % of food preparers & child care givers with appropriate hand-washing behavior							
		- No. of households with hand-washing facilities							

Type of Indicator	Indicator definition	Performance measure (KPI)	Baseline	Target	Progress	Source of data	Responsible
		% of primary schools with hand-washing facilities					
		- % of HHs with utensils' drying facilities					
	<i>Access to and extent of coverage of malaria prevention & treatment measures.</i>	- % of patients with uncomplicated malaria getting correct treatment at health facility & community levels according to the national policy guidelines within 24 hours of onset of symptoms				HMIS, DHS	MoH, NSIR
		- No. of HHs with at least one treated bed net				"	"
		- % people sleeping under treated mosquito nets				"	"
	<i>Access to and use of less polluting energy sources</i>	- time (hrs/ per day) spent by women & children collecting fuelwood					
		- % of HH income spent on fuelwood (energy)					
	<i>Pollution controlled</i>	- % of industries meeting required standards.					MINICOM, REMA, RBS
		- % of industries which have waste disposal facility					
		- % of industries which recycle their wastes					
		- % of projects which have undergone an EIA					"
	<i>Exposure to indoor pollution</i>	- % of households with separate cooking & sleeping areas				DHS, HLCS, CWIQ	NSIR
		- % of households with improved a(i.e. well ventilated) houses				"	"
		- % of industries meeting the required standards.					MINICOM, RBS
Outputs:	<i>Facilities & infrastructure for adequate & sustainable availability/ supply of clean water</i>	- No. of improved water sources					
		- No. of new public stand pipes established					
		- No. of new urban poor HHs (or areas) connected to piped water					MINITERE
		- proportion of watersheds zoned & protected					
		- level of functionality of water sources					
		- No. of Hours per day of water flow (piped water)					
		- No. of districts with water resource monitoring toolkits					
	<i>Facilities & activities for improved / maintenance of water quality</i>	- E.coli / 100 ml of water consumed by residents by source					
		- No. of districts with water quality testing equipment (kits)					DEA/MINITERE
	<i>Activities for promotion of behavior sanitation practices</i>	No. of hygiene sensitization / awareness raising meetings organized / held; No. of people trained in hygiene behaviors					
		No. of WATSAN workers recruited/ trained					MINITERE
		No. of districts which have enacted and are enforcing byelaws on sanitation					

3.3. Vulnerability

Type of Indicator	Indicator definition	Performance measure (KPI)	Baseline	Target	EDPRS	MD	Progress	Source of data	Responsible
			2006?	DDP Gs 2009	2011	2015			Prime Minister's Office, MINALOC
Impact (Final) Indicators	3.1 Deaths or illnesses due to environmental disasters	- % of people displaced by drought or floods or landslides							
		- No. of deaths from floods or landslides(annually)							
		- No. of deaths due to extreme drought (annually)							
		- Amount and value of property of the poor lost due to floods or landslides or hailstorms							
	Impact:	- % of HHs in disaster-affected areas who have lost property							
	3.2 Outbreak of epidemics due to heavy rains, drought, floods or landslides	- frequency of cholera (in urban and rural areas)						HMIS	MoH
	3.3. Costs incurred in disaster mitigation/ control	- % of expenditure spent on disasters (national, sectoral or district) per annum							
	Outcomes:								
		- % of poor people living in flood prone areas (wetlands)							
		- % of people living in drought-prone areas							
		- % of poor people living on hill slopes > 100% slope (i.e. 45 degrees)							
		- % of urban population living in slum areas							
		- % of Imidugudu settlements located in environmentally fragile areas							
	Presence of disaster mitigation/ prevention mechanisms established	- % of farming HHs that have diversified income sources.							
		- % of people living in improved housing conditions							
Intermediate (Proxy Indicators)		- % of watersheds that are protected							MINITERE
		- No. of housing estates with approved EIAs							REWA, MININFRA
		- % of district budget set aside for disaster management							
		- % of wetlands that are conserved							
	Outputs:								
	Mechanisms & activities executed for prevention & monitoring of environmental disasters	- existence of robust early warning systems							Prime Minister's Office
		- % of sectoral or district budgets set aside for disaster-preparedness						DPCs, DDPs	MINALOC
		- Existence of food distribution systems							
		- % of district budget set aside for social mitigation							MINALOC?
		- % of wetlands that are protected.							
		- No. of grouped settlements (imidugudu) sites evaluated for environmental suitability							
		- % of wetlands that are cultivated wetlands that have been subjected to full EIA process						Environment Info System?	REWA, MINITERE, MINAGRI

Table 5: Priority Poverty-Environment Indicators for the Set EDPRS outcomes and Targets

Overarching EDPRS priority related to PE	PE Key Performance Indicators at Impact level	PE Indicators at Outcome (Results) level	Output Indicator(s)	Lead Agency/ Sector for monitoring the PE indicator
a) Access to, productive use & sustainable management of land resources	a1) % of rural households with secure land tenure	% of rural land that is registered/ titled % of female & child-headed households whose land is titled	- Existence of operational land registration services at district & sector level - Sensitization meetings held on land tenure (annually)	MINITERE/ Lands
		- % of land related disputes successfully resolved	- Local leaders trained in land dispute resolution	
		- % of rural households accessing credit from financial instruments using land as collateral	- sensitization on access to credit services	
	a2) proportion of arable land that is protected from erosion	- % of districts which have formulated & are implementing anti-erosion regulations & byelaws	- comprehensive land evaluation / suitability assessment report	MINITERE/ lands/ REMA
b) Forest & tree resources increased & optimally utilized		- % of hilly areas which have been terraced or under soil conservation	- % of Agricultural sector budget that is spent on soil conservation activities	
	b1) proportion of total land area under forest & tree cover	- proportion of public land set aside for forestry activities; % of forests managed through collaborative arrangements with local communities % of bare hills planted with trees	- No. of collaborative forest management agreements signed & implemented by - No. of tree nurseries established (at cell & sector level)	MINITERE/ Forestry
		- No. of biodiversity-based enterprises managed by or employing the poor	- No. of biodiversity inventories held - No. of biodiversity awareness & conservation trainings held - Proportion of tree nurseries stocked with threatened tree species % of farmers who have planted medicinal plant species	
	b2) Annual fuelwood consumption as a proportion of total standing volume	% of households & industries using fuelwood as a source of energy for cooking % of Households using energy saving stoves		MINITERE/ Forestry
c) critical ecosystems conserved and contribute to improved livelihoods of the poor	c1) % of degraded wetlands rehabilitated	- Proportion of wetlands that is protected from intensive human activities - proportion of critical wetlands under intensive agricultural use - Existence & implementation of pro-poor policy & law on wetlands³ % of local communities living around critical wetlands involved in ecotourism or recreational activities	- wetland master plan - No. of trainings in community based natural resources management % of wetlands inventoried	MINITERE/ REMA
	c2) Area (Ha or Sq.km) of steep hills & mountains and rangelands protected from human activities	- Area (in Ha) of bare hills planted with trees & soil stabilizing grasses % of dry lands and steep slopes under cultivation or livestock grazing		
d) Water resources sustainably managed to enhance health and facilitate pro-poor growth	d1) % of people with access to and using safe water and sanitation	% of poor Households within 30 min of functional safe water source; - Per capita water use among poor households - Proportion of household income spent on water; - Average time spent by women & children collecting water	- No. of Water User Committees (WUCs) formed % of WUCs with O&M budget % of WUCs headed by women. - No. of functional safe water sources	MINITERE/ Water & Sanitation

Overarching EDPRS priority related to PE	PE Key Performance Indicators at Impact level	PE Indicators at Outcome (Results) level	Output Indicator(s)	Lead Agency/ Sector for monitoring the PE indicator
		- o % of rural households with access to functional latrines - o % of urban population that are connected to sewage systems.		
	d2) % of irrigation & other water-intensive projects that have been subjected to environmental impact assessment	• Incidences of water stress • Incidences of water-use conflicts • proportion of watersheds protected	- water resources master plan - existence of an inventory of water resources in Rwanda	
e) Ensure food security for all Rwandese	- % of total population who are food insecure	• annual per capita food production • land productivity (tones of food / ha/ annum) • employment & labour productivity among	- % of farmers with access to and using inorganic & organic fertilizers - % of farmers with access to and using improved seed - % of farmers practicing soil conservation technologies	MINAGRI
		- sustainable use of water for production	• use of rainwater harvesting/ water conservation technologies	
		• % Mean daily caloric availability/ intake per person • trends in food prices (for selected staples in Frw/ Kg)		
	- % increase in per capita income among rural households	Proportion of food produced that is sold to the market (by <i>wealth quintile</i>)		
f) Increase in household incomes among the poor		% of household income from agriculture & livestock (by <i>income quintile per annum</i>)		
		% of people with < 1 Ha of land who have regular & sustained off-farm employment		
g) Reduce malnutrition-related mortality & morbidity	Incidences of malnutrition among under-five year olds	- % of under -fives who are underweight - % of rural children under 5 years who are stunted	- o mean daily caloric availability at household level - o % of poor HHs consuming < 80% of caloric requirement (or < 2 meals a day) • % of Health care facilities with feeding program for sick & malnourished children at Health centres • No. of schools with a regular feeding program	MoH/MINAGRI
	- Incidences of water-borne diseases among under-five year olds	- Prevalence of diarrhea among under 5 year olds	- <i>E. coli</i> / 100 ml of water consumed by residents by source - % of health spending on treatment of water-borne diseases - No. of improved water sources - No. of new urban poor HHs (or areas) connected to piped water - No. of schools with a safe water facility within 100 meter radius - % of households practicing basic hygiene	MoH/ MINITERE
		% of households with access to adequate sanitation facilities	- o % of poor HHs with appropriate provisions for disposal of children's faeces - o % of people with knowledge of basic sanitation & hygiene behavior; - o % of households with hand-washing facility - o % of people with knowledge and/ or awareness about transmission of diarrhea diseases. - o pupil/ latrine stanza ration in primary schools	

Overarching EDPRS priority related to PE	PE Key Performance Indicators at Impact level	PE Indicators at Outcome (Results) level	Output Indicator(s)	Lead Agency/ Sector for monitoring the PE indicator
h) Reduce incidences of malaria related mortality & morbidity	Incidences of malaria among women and young children	- Annual death rate from malaria among under- fives & pregnant women - % of malaria cases reported (severe & uncomplicated) - proportion of HH expenditure on malaria treatment	- % people sleeping under treated mosquito nets - % of households maintaining proper hygiene (clearing stagnant water & bushes around homesteads) - No. of HHs with at least one treated bed net - No. of environmental health education activities held	MoH
i) Environmental pollution controlled through effective prevention & and Waste management mechanisms	% of people with access to waste management services in urban & rural areas	▫ % of poor urban households within 200 metres of solid waste skip ▫ frequency of solid waste transportation in areas occupied by the poor ▫ % of rural households with solid waste disposal facility ▫ % slum areas with improved drainage systems	• Local Government budgets set aside for waste management • No. of public waste management sensitization meetings held in urban areas • Operational drainage systems in urban areas • No. of slum improvement projects implemented • No. of Public-private partnerships in solid waste management initiated & operational • % of local governments with byelaws or ordinances on solid waste management	MININFRA/ REMA
	% of industries & commercial entities using cleaner production mechanisms	- o % Legal & regulatory framework for pollution control - o % of industries & other commercial entities with waste water treatment facilities - o % of industries which have undergone environmental audit	• presence of a functional Cleaner Production Centre • No. of Trainings held on Cleaner production • presence of standards & guidelines for industrial waste • Municipal & solid waste management plans • Existence of database & monitoring plan for hazardous wastes	REMA/ MINITERE/ MINICOM
j) Reduce vulnerability to environmental disasters	% of total population who are susceptible or exposed to the risk of floods, landslides or drought	- % of people resettled from wetlands, steep hills or extremely dry rangelands	• Existence of robust early warning system • Inventory/ database of Settlements in wetlands & steep hills • Existence of Resettlement plan & approved budget • No. of sensitization meetings held on environmental disasters	MININFRA/ REMA/ MINITERE
		- % of people living in substandard housing	• No. of grouped settlements (<i>imidugudu</i>) sites evaluated for environmental suitability • % of people living in slum areas	MININFRA
	Incidences of deaths, illnesses or loss/ destruction of property due to floods, landslides or drought	- No. of human deaths or injuries due to floods or landslides	• Existence of disaster preparedness plan • No. of Households who have been rendered homeless or lost property due to floods & landslides • Total value (in Frw) of property lost or destroyed by floods & landslides • % of National (or district) budget spent on disaster mitigation	MINALOC/ Prime Minister's Office

Explaining the logical links between the higher and lower level indicators

The indicators are constructed in a pyramidal model, where more indicators at lower levels (at input and output levels) are monitored to explain the status or trends of higher level indicators (outcome and impact levels). The logical link between lower level indicators and higher level indicators is explained by the “if” ... “*then*” ...analyses i.e. If the input indicators register a positive increase by a certain magnitude, then indicators at outcome levels should register corresponding results; which should lead to or at least contribute to the desired impact. Any discrepancy should be explained in the analysis e.g. where too much outputs (reports, training...) do not correspond to outcomes (short term goals) or impact (overall desired result), then causal factors.

Table 6: Priority Poverty-Environment Indicators for the EDPRS (Sectoral & cross-sectoral)

Key Performance Indicator (KPI) ⁴	Indicator definition (Measure)	Baseline	EDPRS (2011)	Target	Progress	Source of data	Responsible
		2006	MDGs (2015)	DDPs (2009)			
1. % of rural households with secure land tenure	• % of rural land that is registered/ titled • % of female & child-headed households whose land is titled	NA					MINITERE
	- % of land related disputes successfully resolved	NA					
	- % of rural households accessing credit from financial instruments using land as collateral	NA					
2. Proportion of arable land that is protected from erosion	- % of districts which have formulated & are implementing anti-erosion regulations & byelaws		30				
	- % of hilly areas which have been terraced or under soil conservation farming						
3. Proportion of total land area under forest & tree cover	- proportion of public land set aside for forestry activities;	NA					
	- % of bare hills planted with trees	NA					
	- % of forests managed through collaborative arrangements with local communities	NA					
	- No. of biodiversity-based enterprises managed by or employing the poor	NA					
	- Per capita forest or tree cover (Ha per person per district)						
4. Annual fuel wood consumption as a proportion of total standing volume	- % of households & industries using fuelwood as a source of energy for cooking					HLCS	NSIR
	- % of Households using energy saving stoves						MINIFRA
5. Percentage of degraded wetlands rehabilitated	- Proportion of critical wetlands under intensive agricultural use	NA					MINITERE/ MINAGRI
	- Proportion of wetlands that is protected from intensive human activities	NA					MINITERE
	- Existence & implementation of pro-poor policy & law on wetlands ⁵						
	- % of local communities living around critical wetlands involved in ecotourism or recreational activities						
6. Area of steep hills & mountains and rangelands protected from human activities	- Area (in Ha or sq. km) of bare hills planted with trees and/or soil stabilizing grasses						
	- % of dry lands and steep slopes under cultivation or livestock grazing						
7. % of people with access to and using safe water and sanitation	o % of poor Households within 30 min of functional safe water source						
	• Per capita water use among poor households (litres /person/day)	15	20				
	o Proportion of household income spent on water in urban areas						
	o Average time spent by women & children collecting water						
	o % of rural households with access to standard latrines						
	o % of urban population that are connected to sewage systems.					DHS, HLCS	MININFR, NSIR
8. % of irrigation & other water-use/ supply projects that have been subjected to environmental impact assessment	• In cadences of water stress						
	• incidences of water-use conflicts						
	• proportion of watersheds protected						
9. % of total population who are food insecure	• annual per capita food production						
	• land productivity (tones of food / ha/ annum)						

Poverty-Environment Indicators _____
 _____ And Strategy for Monitoring them within the framework of the EDPRS

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List of Persons Interviewed

	Names	Title	Province/ Districts
1	Ruhira jean Pierre	Head of Programme	WHO
2	Rwamasirabo serge	Agricultural statistics	MINAGRI
3	Turatsinze Cyrille	EDPRS focal point	MINAGRI
4	Dr. Nkusi Emilien	I/C Health Management Information System	MOH
5	Rodney Dyer	Rural Livelihoods Advisor	DFID- Rwanda
6	Pacifique	Monitoring & Evaluation Specialist	UNICEF
7	Mwanafunzi Bruno	WATSAN Consultant	World Bank/ Kigali
8	Thembo	Economist	“
9	Ntayombya Phocus	Head of programme UNICEF	UNICEF
10	Mushinzimana Apollinaire	Coordinator/ NDIS	NDIS/ MINALOC
11	Joseph Rwabutogo	Environment Officer	MINITERE
12	Jean Marie Vianney Mushinzimana	Director/ Water & Sanitation	MINITERE
13	Kayitaba Gallican	Land use Task force	MINITERE
14	Bosenibamwe Aimée	Maire of Bulera district	
15	Rwamucyo Ernest	DG Minecofin, EDPRS Coordinator	MINECOFIN
16	Kirenga Clement	EDPRS facilitator, Water and sanitation	MINECOFIN
17	Gatarayiha Jean Phillipe	Head research Unit at NSI	MINECOFIN
18	Ruterana Baudouin	Head of social and demographic statistics at NSI	MINECOFIN

(Footnotes)

1 Pro-poor policy can in this regard implies enabling the poor to participate in and benefit from the conservation & management of wetland resources

2 A standard latrine is defined as having at least 2 metre-depth, appropriately roofed and covered (both hole & door-way)

3 Pro-poor policy can in this regard implies enabling the poor to participate in and benefit from the conservation & management of wetland resources

4 These KPIs are linked to the sector priorities in the EDPRS sector log frames.

5 Pro-poor policy can in this regard implies enabling the poor to participate in and benefit from the conservation & management of wetland resources

