MONITORING AND EVALUATION SYSTEM OF ENVIRONMENT IN RWANDA

DRAFT REPORT

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(Consultant)

28th NOVEMBER, 2009
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MONITORING AND EVALUATION SYSTEM OF ENVIRONMENT IN RWANDA

1. Background

1.1 Introduction

1.1.1 The importance and linkage of natural resources to peoples livelihood and poverty in Rwanda and monitoring and evaluation of environment

Most people in Rwanda depend on natural resources. This is not surprising as 83.4% of the populations live in rural area and 87% of people depend on agriculture for their livelihood and source of income. About 94% of the population depends on wood fuel (solid fuel) for their energy. More than 80% of the diseases suffered by the poor (including deaths) are environment related – particularly water and sanitation. Therefore, destruction of natural resources and environment either by development endeavours or by other human activities like unmanaged cultivation by peasants and mining activities can lead to poverty and the situation has been aggravated by high population growth (2.9%). In Rwanda, the poverty level is 56% having decreased from 64% in year 2000. In Rwanda, like in other poor countries, most all human societies are linked to ecological processes and healthy ecosystems that produce the requirements for life and it is more so for the poor people of the society as they are dependent mostly on natural capital than other section of the population.

The dependence of people’s livelihood on natural resources justifies the necessity to monitor and evaluate the effect and impact of human activities on the environment and the need to take decisions to ensure sustainable development and ensure sustainable livelihood of Rwandan people. While poverty-environment indicators often draw attention to harmful activities, they are also useful indicators of natural factors which impact on human activities.

The planning for saving, guiding and management of natural resources, monitoring and evaluation of the impact of human activities on environment, for long time, lacked policy and law to ensure sustainable exploitation and development of natural resources. The first constitution for Rwanda did not address environmental issues compared to the current constitution. The MINAGRI’s development plan for the 1987–1997 regarded marshes as being important potentiality for agricultural production. The Bill prepared in 1987 for the development of marshland considered safeguarding environment through the development of marshes. It was envisaged to undertake a study on the impacts on the environment which would be done in accordance to the decision of the Ministry responsible for environment. However, such study was not done and as a consequence there has been mismanagement of marshland development leading a number of them drying and unsustainable agriculture. Despite the 1991 Rwanda’s national environmental strategy, the country did not have environmental policy until 2003 and environmental law until 2005. The land resource law of 1982 (law No. 11/82(1982) was not governed by land policy and did not deal with issues of land tenure and a comprehensive land policy and land law were put in place in 2004 and 2005 respectively.

The management of environment and natural resources based on environmental policy (2003) and environmental law (2005) is a recent phenomenon in the county. The national environment policy is supported by an environment law and both instruments provide important tools to Rwanda to deal with

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1 EICV poverty analysis for Rwanda's economic development and poverty reduction strategy final report
2 Ibid
environment management for sustainable development and agricultural development in particular. The following are salient issues in the environment law:

- It outlines major principles of management and protection—these principles have been influenced by international conventions Rwanda has signed.
- It deals with the management and use of agriculture land
- Issues of imports and exports of animals and vegetables
- Control of substances contributing to air pollution, standards of management of dangerous waste show mandatory environment assessment (EIA) should be organised, standards for environment protection and for imported products and protected wetlands and rivers.

Like the management of natural resources and environment, there has not been a comprehensive monitoring and evaluation system for environment. While each sector related to environment have strategic plan, they are a recent phenomenon. The strategic plans for environment has just been prepared and still in draft and environment stakeholders, at the time of drafting this document, are yet to review and agreed on it. The EDPRS has some environment indicators and so are the sectoral strategic plans and district development plans (DDPs) IMIHIGOes. However, the indicators have not agreed upon by all the stakeholders and most of the indicators are not based on scientifically generated data. The designing of this M&E system, therefore is timely.

1.1.2 The objective of the of the assignment

The general objective of the assignment was to prepare an M&E system for environment in Rwanda. The specific objectives of the assignment were:

i. To establish and come up with Poverty-Environment monitoring and evaluation indicators that will measure the progress and performance of the environment in Rwanda.
ii. Establishing a system to collect and record data and information related to poverty-environment monitoring and evaluation indicators
iii. Proposing a system to analyze and manage the data and information
iv. Proposing reporting system with necessary feedbacks.
v. Preparation of M&E training modules and training the stakeholders on the M&E system.
vi. Evaluation of PE project
vii. Support the preparation of Environment strategic Plan
viii. Proposing recommendations for follow-up actions for internalizing the implementation and performance of M&E system

Annex 1 show the terms of reference and section 1.1.4 on the mythology for developing M&E system and the scope of the assignment. The design of the M&E system would assist establishing and understanding and analysing the links between poverty and environment and to integrate Monitoring and Evaluation into development planning.

1.1.3 The objective and functions of M&E system

The objectives of monitoring and evaluation system, is to provide information to staff and management to make informed decisions based on the past experiences, status of performance to ensure the management is accountable to stakeholders and partners. The information is provided by Poverty-Environment indicators. Governments and agencies need to know the progress of their actions such as development endeavours and their performance to achieve the goals and objectives of their institutions. It is for this reason that monitoring and evaluation systems are created to measure and help them understand their performance.

The functions of M&E system for environment are:

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3 The IMIHIGOES are district annual plans prepared within the framework of DDPs
2 Provide data and information for decision making to improve and make the environment better.
3 Put in place a systematic mechanism to collecting accurate data and information on indicators
   • Measure gaps between planned and actual achievements in terms of activities and budgets; global as well as per project
   • Analyze, discuss and propose corrective measures
     o Share information among stakeholders

1.1.4 Overview of methodology for developing me system for environment

The consultant reviewed various documents such as the Rwanda Vision 2020, EDPRS MDGs, Sectoral strategic plans, the DPPs, PERs, Project progress reports; a review of various literature on monitoring and evaluation, review reports like Rwanda DHS, Housing and Living Welfare Conditions (EICV) reports, the Core Welfare indicator questionnaire and the Karongi district pilot questionnaire. Triangulation was used to ensure getting diverse information and views to confirm and counter check to what extent the data was correct. Discussion with stakeholders dealing with environment done on the designing the M&E system. Annex 1 shows discussed and approach taken into account to design M&E system.

1.1.5 Definition of monitoring, evaluation, indicators and typology of indicators

Definition of monitoring and evaluation

In general, monitoring may be defined as the provision of information and the use of that information to enable management to assess the progress of implementation of policies, programmers and projects and to take timely decisions for ensuring that progress is maintained according to schedule. Monitoring refers to the process of routine periodic measurement of inputs, activities, outputs, outcomes and impact. It involves measuring, collecting, canalizing of data and reporting to produce information to management for decision making. Monitoring is based on targets set and activities planned during the planning phases of work. It helps to keep the work on track, and can let management know when things are going wrong. If done properly, it is an invaluable tool for good management, and it provides a useful base for evaluation. It enables you to determine whether the resources you have available are sufficient and are being well used, whether the capacity you have is sufficient and appropriate, and whether you are doing what you planned to do.

Monitoring involves the following:
   • Establishing indicators of efficiency, effectiveness and impact;
   • Setting up systems to collect information relating to these indicators;
   • Collecting and recording the information;
   • Analysing the information;
   • Using the information to inform day-to-day management

Evaluation refer to a process by which policies, programmes, activities, inputs and results are analysed and judged against explicitly stated norms. Evaluation focus on the comparison of actual policy/programme/project impacts against the agreed strategic plans. It looks at what you set out to do, at what you have accomplished, and how you accomplished it.

4 The United Nations Administrative Committee on Coordination (ACC) Task Force on Rural development (Discussion Forum of the panel on Monitoring and Evaluation, 1984) defines evaluation as a process for
Evaluation involves:

- Looking at what the organisation intended to achieve—what difference did it want to make? What impact did it want to make?
- Assessing its progress towards what it wanted to achieve.
- Looking at the strategy of organisation. Did it have a strategy? Was it effective in following its strategy? Did the strategy work? If not, why not?
- Looking at how it worked. Was there an efficient use of resources? What were the Opportunity costs of the way it chose to work? How sustainable is the way in which the organisation works? What are the implications for the various stakeholders in the way the organisation works?

Poverty-Environmental indicators for monitoring and Evaluation, therefore, measures, collects; analysis the information to provides feedback on environment issues while environment evaluation seeks to find the efficiency, effectiveness and impact of poverty-environment issues on the natural resources and ecosystem and peoples livelihood.

**Definition of Indicators**

The M&E system for environment is about seeking to measure the progress and performance and to communicate that information in a simplified manner for decision making by management. In order for Monitoring and Evaluation systems to gauge the progress and performance of policies, programmes and projects, the use indicators become important. The definition of indicators and type of indicators are important to facilitate the understanding of the analysis done but also their importance in communicating information to staff and management for decision making to ensure attainment of organizational, programme or project goals and objectives. 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. Indicators are deemed useful in simplifying, clarifying and monitoring the complex links between poverty and environment\(^5\). Therefore, indicators are variables used to measures what is being done and achieved. They are factors or tangible signs that something has been done or has been achieved. Indicators tell us what we want to measure and are only units of measure. Indicators are the variables used to measure progress toward the goals and should be not confused with targets which are the quantified levels of indicators that a country or society wants to achieve at a given point in time\(^6\).

It is important to recognize that an indicator may reflect an aggregation or summary of particular issues. Indicators focus and condense information about complex issues for decision-making, management, monitoring and reporting purposes. Indicators provide a signal to an issue of greater importance or make more evident a trend or phenomenon that is not immediately detectable. Decision makers require timely, precise and reliable information concerning the environment and sustainable development. Indicators provide that information and possess the potential to become important tools for communicating scientific and technical information. They can also facilitate the communication of such information to diverse user groups and society as a whole, helping to transform information into action. In respect to environment; indicators are used to capture the sustainability of environmental trends as well as trends in human vulnerability to environmental change.\(^7\)

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7 Environment Indicators; Fourteenth Meeting of the Forum of Ministers of the Environment of Latin America and the Caribbean Panama City, Panama 20 to 25 November 2003.
The acceptability of any indicator depends on the availability and confidence of the data, as well as the interpretation of the indicator. Interpretation is particularly important as indicators tend to provide the essence of a situation rather than the whole picture. In this respect, an assessment of poverty-environment indicators to use in Rwanda has been mainly country specific and more focusing to existing poverty-environment indicators which have data available, indicators with incomplete data and those without data but important to capture the trend of affairs on poverty and environment situation and facilitating decision making to improve the management of natural resources and environment. There has also been minimum borrowing from generic indicators particularly where an indicator in a situation but is not existing in Rwanda.

**Types of Indicators**

It is important to review the types of indicators because different types of indicators do require different types of data, and having different properties. There are two main categories of indicators, namely;

i. **Intermediate indicators**— measures a factor that determines an outcome or contributes to the process of achieving an outcome; intermediate indicators may be further subdivided into ‘input’ and output’ indicators

ii. **Final** – measures the effect of an intervention on individuals’ well-being; final indicators may be further subdivided into ‘impact’, measuring key dimensions of well-being, and ‘outcome, referring to access to, use of, and satisfaction with public services.

Environmental indicators can be ‘descriptive indicators’ whereby they attempt to describe the state of environment in relation to a series of environmental issues, such as a loss of biodiversity, or can be ‘Performance indicators’ geared to compare actual conditions versus desired conditions, expressed in terms of environmental targets. Performance indicators, therefore, measure the “distance” to certain environmental targets and make institutions more accountable for their operation.

Whichever the category and type of indicator, poverty-environmental indicators do reflect trends in the state of the environment and have the following functions:

i. Assess conditions and changes

ii. Compare across places and situations

iii. Assess conditions and trends in relation to goals and targets. They measure gaps between planned and actual achievements.

iv. Provide early warning information

v. Anticipate future conditions and trends.

vi. They reduce the number of measurements and parameters that normally would be required to give an exact presentation of a situation. As a consequence, the size of an indicator set and the level of detail contained in the set need to be limited. A set with a large number of indicators will tend to clutter the overview it is meant to provide.

vii. They simplify the communication process by which the results of measurement are provided to the user. Due to this simplification and adaptation to user needs, indicators may not always meet strict scientific demands to demonstrate causal chains. Indicators should, therefore, be regarded as an expression of "the best knowledge available".

Therefore, indicators are measurable properties of the environment, defined in a time, space and policy context. Their purpose for environment reporting is to provide a detailed assessment of the environment status. Poverty-environmental indicators do represent a powerful tool for communicating synoptic or summary information. They represent a bridge between the wealth of detail and the need for interpreted information focusing on the interactions and changes in the environment. Therefore,
indicators help define the nature and size of environmental problems, set goals for their solution, and track progress towards those goals.
1.2 The purpose and Importance of Poverty-Environment monitoring and evaluation indicators

The purpose of poverty-environment indicators is to provide simple and clear information to decision-makers in the public, private and civil societies in the area of environment about the progress towards specific goals and targets, using a list of manageable poverty-environment indicators. Governments and agencies need to know the progress of their actions such as development endeavours and their performance to achieve the goals and objectives of their institutions. It is for this reason that monitoring and evaluation systems are created to measure and help them understand their performance. Monitoring and evaluation (M&E) indicators are used to measure the quantity, quality, and targeting of the goods and services and outputs that the state and agencies provide and to measure the outcomes and impacts resulting from these outputs. The M&E systems also help and act as a means to gauge the good and poor performance. Environmental indicators, therefore, reflect trends in the state of the environment, help the identification of priority policy needs and the formulation of policy measures, and monitor the progress made by policy measures in achieving environmental goals. Environmental indicators also represent a powerful means to communicate environmental issues not only to policy makers but also to the general public, thus raising awareness.

Poverty-environment (PE) indicators are about establishing and monitoring the links between poverty and environment. In addition, the poverty-environment indicators reflect key factors determining the state of the environment and contribution of environment poverty, and show whether we are moving towards environmental sustainability or not. Given general important functions of indicators referred above, poverty-environmental indicators can be useful in the following ways;

i. They provide feedback on changes in the system and in this respect assist in the identification of priority policy needs and the formulation of policy measures

ii. Monitor the progress made by policy measures in achieving environmental goals through and improving implementation, adaptation and ensure movement towards a common goal

iii. Environmental indicators also represent a powerful means to communicate summary information on environmental issues not only to policy makers but also to the general public, thus raising awareness but also for decision making. Indicators reduce the number of measures required to understand changes in the environment and simplify the communication process of transmitting information to the user.

iv. They lead to increased accountability.

The general rule of thumb with indicators is "what gets measured gets done". For this reason indicators should be well chosen and should emphasize and relate to issues that need action or attention. However, selected indicators should not only be manageable but also have to be understandable and relevant for decision-making, evaluation and communication
1.3. The environment in the planning process

The consultant reviewed the extent to which the MDGs, particularly MDG7 concerning environment and the sectoral and district environment issues have been integrated in the EDPRS. This exercise was done in order to identify gaps in mainstreaming environment into the countries long term and medium planning process, namely; the Vision 2020 and EDPRS and to identify gaps in mainstreaming MDG poverty-environment indicators and gaps in mainstreaming environment issues from sectoral strategic plans and DDPs. Those indicators not integrated in EDPRS have been taken account in developing indicators in the M&E system.

MDGs have eight goals monitored through 18 targets and 48 indicators (Annex1). They address developmental needs of the people. The MDGs indicators measure the progress and performance of development and improvement of human welfare. Environment issues cut across all MDGs and through MDG’s strong links to poverty. Annex 1 shows the possible links of MDGs to environment. It is noted that environment is indirectly related to the 6 MDGs and it is only the MDG 7 that is directly relates environment.

The MDG 7 is about ensuring environmental sustainability. Annex 2 gives the details of MDG 7 in terms of targets and indicators. In general the MDGs, poverty and environment issues have been integrated into the Rwandan planning process. The key indicators of the Rwandan Vision 2020 (Annex1, page 25) cut across all MDG indicators and aligned with MDGs, particularly the MDG1 related to reducing poverty. A quick quantitative analysis of the integration of MDG 7 into the Rwandan EDPRS\textsuperscript{10} show that environment has largely been integrated in EDPRS. The results of analysis on individual targets and indicators show that EDPRS has Integrated the principles of sustainable development into country policies and programs to reverse the loss of environmental resources (MDG Target 1). In this respect, the proportion of people without sustainable access to safe drinking water and basic sanitation (MDG target 2) have been mainstreamed and linked to EDPRS (Score 3) whereby they are elaborated into EDPRS and the latter shows baseline information on MDGs and have some indicators reflected in outcome and intermediate indicators. However, the linkage of sanitation is weak and no integration of MDG target 3 (improvement in the lives of slum dwellers) and related indicator (annex3).

Most important for the M&E system is the integration of poverty-environment indicators. Most of indicators for MDG target 1 are not well linked and harmonised with EDPRS accept the area covered with forestry which is reflected in EDPRS outcome indicators (score 3). Indictors on energy, carbon emissions, and consumption of ozone-depleting substances and proportion of population using solid fuels are not mentioned nor elaborated in EDPRS document.

\textsuperscript{10} The consultant used World Bank Quantitative analysis method to mainstream environment in poverty reduction strategies to analysis the linkage, alignment and integration of MDG 7 in the Rwandan EDPRS (2007-2012). The analysis is done by the use of scoring method. A score in the range of 0 to 3 is used depending on the issues under analysis: The following scoring criteria are used:

0 = not mentioned in EDPRS
1 = mentioned but not explicitly and not elaborated in the EDPRS priority and indicators
2 = elaborated in the EDPRS text but not explicitly and has aspects related to the issue under review and indirectly reflected in EDPRS priorities and indicators
3 = Direct link to MDG target, indicator and in reflected in EDPRS priorities and indicators

The scoring method is a subjective interpretation. Though not intended to be scientifically precise, this scoring method is a practical way to condense considerable information into numbers that have a clear interpretation. Comments are added to elucidate the situation surrounding the scores given to the issue being reviewed.
The indicators of MDG target 2 are all well linked and harmonized; the indicator on access to drinking water is well linked, aligned and harmonised with EDPRS as it is a part of EDPRS’s Outcome indicators. However, no indicators to reflect or measure sanitation situation. EDPRS, however, shows that measures will be taken to increase the proportion of schools, health centres and rural households with latrines. The collection and processing of solid waste will be extended to more households and institutions. There is need, therefore, for EDPRS to have indicator to represent sanitation, albeit at intermediate level indicators.

In case of MDG target 3 indicator referring to a proportion of households with access to secure tenure, the indicator is neither mentioned nor elaborated on in EDPRS document irrespective ongoing efforts of the government on land tenure issues. The gap analysis show that the following MDG indicators are not integrated in EDPRS and has been adapted in M&E system:

- Improvement in the lives of at least 100 million slum dwellers is MDG target is not linked and integrated in EDPRS
- Energy use per unit of GDP is not integrated in EDPRS
- Per capital CO2 emissions and consumption of ozone-depleting substances
- Population using solid fuels
- Proportion of population with sustainable access to adequate sanitation
- Non-agricultural erosion indicator
- Threatened animal species as % of total known animal species'
- % of rehabilitated/total area of wetlands
- % change of the area of wetlands
- Indicators of water quality and water pollution
- % of households with food insecure or vulnerable
- Indicators of land tenure
- Pro-poor Indicators such as % of women and children holding land titles.

The consultant made an assessment of the extent the EDPRS has mainstreamed the environment issues, using the same World Bank method of quantitative analysis for mainstreaming environment into poverty reduction strategies was use for analysis\textsuperscript{11}. The general perception result is that the EDPRS has mainstreamed environment much greater than PRSP 1. The review of EDPRS shows that poverty-environment issues are given significance and environment is considered as strategic objective of EDPRS. The environment has been elevated to a sector while still being recognized as a cross-cutting sector. The overall scoring on EDPRS for considering environment in its context is 83 percent. The latter, shows that Rwanda's EDPRS has largely considered environment in its context (Annex 4, section 1). However, The EDPRS did not consider environment in specific and clear terms as a theme which requires risk management. This

\textsuperscript{11} Like in assessing the linkage and alignment of MDGs with EDPRS, a scoring method (unweighted) is used. A score in the range of 0 to 3 is used depending on the issues under analysis:

\begin{itemize}
  \item 0 = not mentioned in EDPRS
  \item 1 = mentioned but not elaborated in the EDPRS
  \item 2 = elaborated in the EDPRS text but not well integrated
  \item 3 = Best practice on environment: Direct link to EDPRS and well integrate in EDPRS
\end{itemize}
explains why there is little, if any, analysis of implications on environment by the big push strategies in infrastructure and intensification in agriculture. The EDPRS analysis of environment in its context would be enriched by working and including its context, during its updating after mid-term review, the following:

- The review of socio-economic and ecological importance of natural resources and evaluation of ecological cost and benefits of the natural resources being affected
- Consider environment as a theme which requires risk management and look at the negative environment impact of big push strategies such intensification of agriculture and infrastructures and to devise mitigation measures in EDPRS.
- An assessment of historical developments of environment and resultant environment situation in the country and to integrate the cause-effect of poverty-environment in the EDPRS.

The analysis shows that environment issues have largely been mainstreamed in EDPRS and about 70% of environment issues are elaborated in EDPRS (Annex 4 section 2). However, there is need to integrate fully the following environment issues and related poverty-environment indicators;

- Integrate non-agricultural land under degradation is not covered.
- A review of environmental issues and problems of unproductive land on desertification and cultivation of marginal unproductive lands.
- Air issues and their environment implication on air pollution. The problems and impact of air pollution needs to be reviewed and mitigation measures elaborated comprehensively.
- the implication of natural resources method of extraction and development undertakings in the area of energy, etc.; the cost and benefits of natural resources need to reviewed and to be well integrated in EDPRS.

The EDPRS performance in respect to the Causal Links Assessment between environment and poverty is not satisfactory. The score on Causal Links Assessment of EDPRS with environment is 44.4 % (Ann4 section 3). The average score is 1.3 compared to environment issues links to EDPRS which is about 2.3. This shows EDPRS has done great achievement in linking environment issues to poverty than assessment of causal links of poverty-environment. EDPRS needs to address the following causal linkages:

- Address environmental degradation links to HIV/AIDS
- Elaborated on using economic policies like taxation, subsides and exchange rates to influence management environment.
- Make foreign investment more pro–poor and pro-environment
- Encourage sustainable consumption and production
- Make comprehensive review of causal linkages with development cooperation and debt relief

The EDPRS has integrated the response systems (Investment, policy, legal and regulatory and management issues by 70 % (Annex 4, section 4). The average is 1.4 less than a halve of the highest score of 3. The latter is a reflection of some response systems being not well linked with and integrated in EDPRS. The EDPRS does not elaborate explicitly on the commercial, social
and ecological functions of environment. The latter is important for advocacy on environment and to get people in the planning levels get to appreciate environment and to allocate adequate funding. It does not evaluate investment in air quality and sustainable extractive industry management and does not evaluate human and institutional capacity needs for sustainable environmental management (availability of personnel, skills).

EDPRS Development Process has been highly participative. The average consultation in EDPRS development process was 3 equal to highest score of 3. Therefore, there were 100% of the stakeholders (Anne 4, section 5)

2.0 The M&E system for environment

2.1 The conceptualization and focus of M&E system for environment

2.1.1 The focus and organization of envisaged M&E system for environment

A four tier monitoring and evaluation system is envisaged for the M&E system for environment in Rwanda. The M&E system is focused at national level, sectoral district and local levels. The development of poverty-environment indicators is done across all the four spheres of government, namely; national, sectoral and district levels. The collection of information on indicators is done at local level to ensure that the data and information generated represents the local environment situation (figure 1). The information collected will have to be comprehensive to include the social-economic data and information that is needed by the sector and district for planning purposes.

In Rwanda, sectoral ministries are responsible, besides policy, for monitoring and evaluation and districts and agencies (Authorities) are responsible for policy, programme and project implementation. All these administrative levels require monitoring and evaluation indicators to measure their performance. The proposed M&E system makes the sectoral ministries, agencies and districts to be responsible for monitoring and evaluation of environment and monitoring and evaluation are a part and parcel of national, sectoral ministry and district monitoring and evaluation system. REMA, therefore, will not by itself do the monitoring and evaluation of the environment but will be receiving monitoring and evaluation reports from ministries, agencies and districts. The development of M&E system has ensured that all poverty-environment indicators are establishes within the planning framework of all sectors and institutions dealing with environment in the country and are integrated in their data collection, data analysis and reporting systems. Therefore, what this M&E system does is to prepare poverty-environment indicators which will be monitored and evaluated within the sectoral ministries, agencies and districts frameworks.

The M&E system makes each stakeholder to be responsible for poverty-environment indicators that are related to their information requirement. The data and information generated by one stakeholder will have to be distributed to other partners. Chart 1 shows the monitoring and evaluation information network and the institutions involved in monitoring and evaluation of environment.

Figure 1: Three levels (tier) for developing monitoring and evaluation indicators
2.1.2 The framework for developing M&E system:

2.1.2.1 The planning, monitoring and evaluation framework

Monitoring and evaluation indicators have to be developed within an accepted conceptual framework. Monitoring and evaluation is a part of the planning process. It is during planning process that indicators for monitoring and evaluation are set up or defined to measure the progress and performance institutional objectives, outcomes and outputs. The fundamental starting point in designing M&E system for environment, therefore, is to review the planning framework in Rwanda, in particular the long term and short term planning frameworks, sectoral and district planning process. The long term and short term planning framework involves planning for the MDGs, vision 2020 and the EDPRS; the sectoral and district planning frameworks. Poverty-environment indicators have been identified for all those planning levels (Figure 2). Therefore, the national plans, sectoral and district plans provide indicators to measures the progress and performance of the institutions concerned. The MDGs indicators, as we mentioned in section 1.3 were not all taken up in EDPRS. Those MDG indicators have been taken up in the M&E system. The EDPRS has indicators at outcome and output levels while all sector’s strategic plans and district development plans (DDPs) have indicators along the various sectoral and district plan objective structure (objective, outcome and output levels). The M&E system took account all these indicators in identifying and developing M&E system (Figure 2).
2.1.2.2 Identifying information requirement by the stakeholders in environment

Another important framework for developing poverty-environment indicators is identification of information requirement by the stakeholders in environment sub-sector and in cross-sector institutions dealing with environment. The consultant identified information requirements required (Annex 5 and identified existing indicators and additional indicators to cater for information requirement for decision making (Figure 2),

2.1.2.3 Identifying existing data sources, collection mechanisms, data analysis and reporting systems

The existing data sources are the Household Living Conditions Survey (EICV), agricultural surveys, agricultural and livestock census; the Food Security Survey; the Core Welfare Indicators Questionnaire (CWIQ); the Multiple Indicator Cluster Survey (MICS); Public Expenditure Reviews (PER, Health management information system (HMIS), the State of Environment (SOE) and Education management information system (EMIS) which covers water, sanitation and feeding in schools. The existing data sources of data and information and except for public expenditure reviews and the SOE are based on surveys and scientifically determined methodologies. However, there are other sources of secondary data and information on poverty-environment indicators such as studies, ministerial and district plans, annual and quarterly reports, joint sector review reports and several meeting reports. Annex 6 shows existing poverty-environment indicators.

What is evident is that poverty-environment indicators exist in the various survey documents, studies and ministerial and district plans and reports. They are not limited as it is usually perceived\(^\text{12}\). Nevertheless, the poverty-environment indicators have not been isolated, organised and set aside as poverty-environment indicators. Secondly, with exception of indicators from the surveys and to a limited extent the studies, most other monitoring and evaluation indicators are not scientifically collected and likely to compromise their quality and accuracy

2.1.2.4 Existing data analysis and reporting system

Data analysis and reporting system is the last but important stage in developing poverty-environment indicators. A lot of data is collected but there has been limited data analysis and consolidation. Most of data is coming from projects but that information is not organised, analysed and integrated into the existing information systems for decision making. This is explained by inadequate data analysis capacity in terms of limited skills and availability of equipment. There is also apparent lack of structures for data analyses, data collected, therefore, is not well organised by themes or categories, lack of identifications of patterns, establishing data correlations and trends and interpreting of data into information for effective decision making. The consultant has observed the following problems and constraints on monitoring and evaluation of environment and developing poverty-environment indicators in Rwanda:

- Lack of comprehensive and integrated M&E system at national, sector and district levels to trac the progress and performance of environment development.
- Limited Quality and accuracy of data-Most of the indicators have no data source, source is not complete. There are is no regular and scientifically collected data. Not

withstanding the foregoing surveys Most of the secondary data that exist is estimated,
guessed and not standardised. It is not easy to tress their source.

- There is a sectoral approach to data handling and management. The sectoral approach 
  encourages each institution to generate data and information using their own 
  institutional standards and codes and this limits communication among environment 
  stakeholders.
- SOE indicators are not complete and well organized according to environmental 
  themes and according to type of indicators.
- Conflicting data across most institutions, including districts
- Consolidation, analysis, dissemination and feedback, both vertically and horizontally 
  is limited and lacking in some aspects. The consolidation and analysis of data is 
  needed at district, sectoral and national levels where each level has to know which 
  data and information it needs, which data and information to disseminate to other 
  related institutions and necessary feedback and follow-up
- There is no system at REMA to capture monitoring and evaluation information from 
  different institutions and for those institutions also sends and gets information from 
  REMA. The information networks and communication system among environment 
  stakeholders is lacking. There is no stop centre to capture, analyze and disseminate 
  M&E information. The network framework and information linkages are not defined 
- Apparent inadequate capacities to collect, analyse and consolidate information 
  across all institutions but particularly in districts and REMA
- Programme/Project M&E information is not fed into REMA, Ministry and District 
  management information system to gauge their impact and effect on institutional 
  objectives.

The foregoing problems and constraints reflect the magnitude of challenges that faces the 
establishing effective and functional M&E system that can facilitate decision making in 
environment. The following major challenges that will have to be dealt with to improve 
monitoring and evaluation of environment:

- Development of poverty-environment indicators for environment and cross-cutting 
  sectors across national, sectoral and district levels.
- Improve the measurement, standardization and understanding of poverty-environment 
  indicators among stakeholders
- Establishment regular data collection mechanism at local levels in districts to generate 
  data on indicators.
- Setting up effective data analysis, data consolidating from many sources and reporting 
  system to encourage adequate and effective utilisation of M&E environment information.
- To ensure effective supply and demand of M&E information in order to generate reliable 
  data and information and to ensure it is also effectively used by information users.
- Improvement of information communication among suppliers and users of information
- Ensure adequate resources for M&E system
- Ensure sustainability of M&E system reduce substantially dependence on donors for 
  M&E resource.
The M&E system framework for developing poverty-environment indicators

1. **Stakeholder Information requirement by Management**
2. **Existing M&E information**
   - **Existing poverty-environment indicators on impact, outcome and output**
   - **Additional poverty-environment indicators**
   - **Poverty-environment Impact indicators**
   - **Poverty-Environment outcome and output**
   - **Natural resources specific outcome and output indicators**
   - **Cross cutting sector outcome and output poverty-environment indicators**
3. **Data collection exercise**
   - **Poverty-environment Indicators from the field survey exercise**
4. **Data analysis and processing**
5. **Determining sources of data and selection of data collection mechanism**
6. **REMMA strategic plan**
7. **State of environment**
   - **The planning Framework and objective structure**
   - **Long term and medium term planning framework (MDG, VISION 2020, EDPRS, CRAP Indicators**
   - **The natural resources sub sector logic frame**
   - **Cross cutting sectors strategic plans objective structure and logic framework**
   - **District Development Plans/ IMIHIGO objective structure**
   - **Local community level data collection effort**
8. **Environment Issues**
9. **Environment Sub-sector objectives and Log-frame;**
10. **State of environment**

**Defining Reporting system**
- **Consolidate M&E System in a Final**
- **Determine type of reports and reporting frequencies**
- **Challenges and recommendation**

- *MDG reports*
- *EDPRS annual reports*
- *Sector annual, quarterly and monthly reports*
- *The state of environment report*
- *District annual, quarterly and monthly reports, Etc.*
• Linking project/ programme information data to National, Sectoral and District decision making and objectives.
• Strengthening capacity to collect, analyse and process, consolidate, utilisation and feedback of information.

The envisaged M&E system have again been reviewed the challenges in section 4 and recommendations to deal with them are given are section 5.

2.3 Identifying poverty- environment monitoring and evaluation indicators

2.3.1 The Bellagio Principles, the pressure-state-response (PSR) and Drive, Pressure, State Indicator Response (PSIR) frame works for selection of Poverty- Environment Indicators

The development and selection of poverty –environment indicators have been influenced and guided by Bellagio Principles and Drive, Pressure, State Indicator Response (PSIR) frame works. The development of poverty-environment indicators requires understanding the cause effect between environment system and human system. The relationship and interrelation between the two systems ushers in environment changes that impact on human health and subsequent response to deal with the environmental changes. The DPSIR framework is viewed as providing a systems-analysis view of the relations between the environmental system and the human system (Smeets and Weterings, 1999). According to this view, social and economic developments (driving forces) exert pressure on the environment and, as a consequence, the state of the environment changes (e.g. provision of adequate conditions for health, resources availability and biodiversity). This leads to impacts on human health, ecosystems and materials that may elicit a societal response that feeds back on all the other elements (Smeets and Weterings, 1999).

Although the DPSIR framework was developed as an extended cause-effect-response model, the framework is most useful in describing the origins and consequences of environmental problems. In developing linkages between the various categories the dynamic relationships within a system can be analysed, using the DPSIR framework to ensure that all elements of each theme were covered.

The DPSIR framework allows, therefore, the development of indicators of drive, indicators of pressure, indicators of state, indicators of response and indicators within the cause –effect – response framework. Driving forces are the human influences and activities that, when combined with environmental conditions, underpin environmental change. Indicators for driving forces describe the social, demographic and economic developments in societies and the corresponding changes in lifestyles, overall levels of consumption and production patterns. Primary driving forces are population growth and developments in the needs and activities of individuals. Driving forces provoke changes in the overall levels of production and consumption, and thus exert pressure on the environment (Smeets & Weterings, 1999).

Impacts are the results of pressures on the current state of the environment, and which occur in a certain sequence, for instance, air pollution may cause global warming (primary effect), which may in turn cause an increase in temperature (secondary effect), which may provoke a rise of sea level (tertiary impact), which could result in a loss of biodiversity and thus impact on human health and well-being (Smeets & Weterings, 1999).
The development Poverty-environment indicators have been facilitated by using the DPSIR framework to ensure that all elements of each of them were covered. Annex 8 shows the selected indicators organised within the DPSIR framework model.

The development of poverty-environment was done keeping in mind the Bellagio Principles (Box 1 below). Although the Bellagio Principles are not a framework as such, they provide guidelines for the implementation of sustainable development.
Box 1: A summary of Bellagio Principles (Hardi & Zdan, 1997)

1. GUIDING VISION AND GOALS
   • Be guided by a clear vision of sustainable development and goals that define that vision.
2. HOLISTIC PERSPECTIVE
   • Include review of the whole system as well as its parts;
   • Consider the well-being of social, ecological, and economic sub-systems, their state as well as the direction and rate of change of the state, of their component parts, and the interaction between parts;
   • Consider both positive and negative consequences of human activity, in a way that reflects the costs and benefits for human and ecological systems, both in monetary and non-monetary terms.
3. ESSENTIAL ELEMENTS
   • Consider equity and disparity within the current population and between present and future generations, dealing with such concerns as resource use, over-consumption and poverty, human rights, and access to services, as appropriate;
   • Consider the ecological conditions on which life depends;
   • Consider economic development and other, non-market activities that contribute to human/social wellbeing.
4. ADEQUATE SCOPE
   • Adopt a time horizon long enough to capture both human and ecosystem time scales thus responding to needs of future generations as well as those current to short-term decision making;
   • Define the space of study large enough to include not only local but also long distance impacts on people and ecosystems;
   • Build on historic and current conditions to anticipate future conditions - where we want to go, where we could go;
5. PRACTICAL FOCUS
   • An explicit set of categories or an organizing framework that links vision and goals to indicators and assessment criteria;
   • A limited number of key issues for analysis;
   • A limited number of indicators or indicator combinations to provide a clearer signal of progress;
   • Standardizing measurement wherever possible to permit comparison;
   • Comparing indicator values to targets, reference values, ranges, thresholds, or direction of trends, as appropriate;
6. OPENNESS
   • Make the methods and data that are used accessible to all;
   • Make explicit all judgements, assumptions, and uncertainties in data and interpretations.
7. EFFECTIVE COMMUNICATION
   • Be designed to address the needs of the audience and set of users;
   • Draw from indicators and other tools that are stimulating and serve to engage decision-makers;
   • Aim, from the outset, for simplicity in structure and use of clear and plain language.
8. BROAD PARTICIPATION
   • Obtain broad representation of key grass-roots, professional, technical and social groups, including youth, women, and indigenous people - to ensure recognition of diverse and changing values;
   • Ensure the participation of decision-makers to secure a firm link to adopted policies and resulting action.
9. ONGOING ASSESSMENT
   • Develop a capacity for repeated measurement to determine trends;
   • Be iterative, adaptive, and responsive to change and uncertainty because systems are complex and change frequently;
   • Adjust goals, frameworks, and indicators as new insights are gained;
   • Promote development of collective learning and feedback to decision-making.
10. INSTITUTIONAL CAPACITY
    1. Clearly assigning responsibility and providing ongoing support in the decision-making process;
    2. Providing institutional capacity for data collection, maintenance, and documentation;

2.3.2 Environmental issues to guide the development of poverty-environment indicators
Box 1 below shows the environmental issues framework for the development of poverty-environment indicators. The environmental issues do reflect environmental concerns that need monitoring, evaluation and management. The selected indicators in annex 7 relate to these environmental issues and one environment issue can be related to more than one poverty-environment indicator and they ensure the development of comprehensive indicators.
### Box2: Environment themes and Issues for development of Indicators

<table>
<thead>
<tr>
<th>Environment themes</th>
<th>Environment Issues</th>
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<tbody>
<tr>
<td>Environment health</td>
<td>Water borne diseases</td>
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<td>Vector borne diseases</td>
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<td>Access to drinking water</td>
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<td>Sanitation conditions</td>
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<td></td>
<td>Hygienic condition</td>
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<td></td>
<td>Food Security</td>
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<td></td>
<td>Environmental impact on human health</td>
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<td>Land use</td>
<td>Land degradation</td>
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<td>Land use management</td>
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<td>Urbanization</td>
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<td>Land tenure and land use management</td>
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<td>Access to land and landlessness</td>
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<td></td>
<td>Waste management</td>
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<td></td>
<td>Land suitability and productivity</td>
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<tr>
<td>Biodiversity</td>
<td>Species and genetic diversity loss</td>
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<td></td>
<td>Habitat change or loss</td>
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<td></td>
<td>Loss of landscape function</td>
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<td>Alien invasive organisms</td>
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<td></td>
<td>Over-harvesting and deforestation</td>
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<td>Genetically modified organisms</td>
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<td></td>
<td>Loss of natural and cultural heritage resources</td>
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<td>Bio-prospecting</td>
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<td>Freshwater</td>
<td>Limited freshwater resources</td>
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<td>Changing freshwater quality</td>
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<td>Degradation and loss of freshwater ecosystem integrity</td>
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<td>Flood and drought management of inland water resources</td>
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<td>Inadequate and inequitable distribution of resources</td>
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<td>Access to water for Irrigation</td>
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<td></td>
<td>Water management</td>
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<td>Water development</td>
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<tr>
<td>Climate</td>
<td>Climate change and variability</td>
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<td>Air quality</td>
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<td>Forestry</td>
<td>Stratospheric ozone depletion</td>
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<td>Forestry coverage</td>
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<td>Forestry development</td>
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<td>Forestry utilisation for wood resources</td>
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<td>Forestry management</td>
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<tr>
<td>Habitat/ Housing</td>
<td>Slum housing conditions</td>
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<td>Slum development</td>
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<td>Institutional issues</td>
<td>Institutional roles</td>
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<td>Institutional development</td>
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<td>Capacity building</td>
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<td>development of policies, laws and regulations</td>
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<td>Policy implementation and monitoring</td>
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<td>Role in environmental decision making</td>
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<td>Decentralization of services</td>
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<td>Insufficient involvement and empowerment of people in environmental</td>
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<tr>
<td>Economic and Poverty Indicators</td>
<td>Economic growth and development</td>
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<td></td>
<td>Poverty and inequality</td>
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<td></td>
<td>Increased population growth, production and consumption</td>
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<tr>
<td>Agriculture</td>
<td>Food production</td>
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<td>Soil and water conservation</td>
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<td>Incomes levels</td>
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<td>Wetland cultivation</td>
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<td>Input use</td>
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<tr>
<td>Vulnerability/disaster</td>
<td>Floods and slides</td>
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<tr>
<td>Wastes</td>
<td>Disaster management</td>
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<tr>
<td></td>
<td>Waste management</td>
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<tr>
<td></td>
<td>Sanitation and hygiene</td>
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2.3.3 The criteria for selecting poverty-environment indicators

A variety of poverty-environment indicators can be used to monitor change in any particular situation and evaluate the impact of human activities on environment. It is usually costly to collect data on indicators and resources earmarked for monitoring and evaluations are usually limited. It is necessary, therefore, to choose the right set of indicators for monitoring and evaluation purpose. This choice depends on the goal or purpose for which monitoring is required, the scale at which monitoring is required and on the quality of available indicators. The selection of indicators, besides removing similar indicators, was guided by the following criteria for good indicators. It was, however, necessary to add criteria of impacts on children and other vulnerable groups as they are most poor and vulnerable groups.

Data availability for poverty-environment Indicators

In order for indicators to provide decision-makers with appropriate and usable information, they need to be based on data that is both scientifically valid and statistically sound. The data should be accurate and reliable too. It is paramount that each indicator should be based on data that is reasonably cost-effective to collect, particularly in the long term. The data should also be available and accessible in the long term. Scoping of documents, studies and reports was done and discussion with stakeholders was done to identify indicators with data. The poverty-environment selected, therefore show those with available data, those with incomplete data and those indicators without data.

The measurability of poverty-environment

The principle of measurability is important in the selection of indicators. If an indicator can not be measured, it can not be selected for monitoring and evaluation purpose. It should be possible to measure the indicator on the basis of data available now or in the near future subject to assured scientific validity of measurement procedures; and the data is adequately documented, of known quality, updated at regular intervals in accordance with reliable procedures, and collected at reasonable cost. The indicators should be defined so that their measurement and interpretation are as unambiguous as possible, preferably using data that is readily available, relevant, reliable and meaningful. The consultant has defined what each indicator is supposed neither to measure nor only to help to remove one of the similar indicators but also to ensure that data generators and users can have the same meaning on the indicators. The M&E system had a workshop with all stakeholders with the aim of reaching upon an agreement on the indicators but also what they are supposed to mean and measure.

The poverty-environment indicators must be based on data of the correct spatial and temporal extent. Sufficient historical data must be available to identify trends over time. The data collection process should have minimal environmental impacts.

Policy relevancy

The indicator must be relevant to policy and management needs within the Rwanda setup. The indicator must be therefore being associated with one or several environmental policy issues. It should be able to provide information that is relevant to policy and management needs in order to be useful to the user. These indicators were, in this, respect drawn from the national, sectoral and district planning frameworks and information requirement by management.
**Indicators are relevance to purpose that it is intended to be reflected**

Indicators should effectively target the factor which they are measuring, and should avoid ambiguity and arbitrariness in the measurement. The proposed indicators should be relevant to the priority issues the indicator is trying to measure and track. They should be able to measure factors that reflect the goals/objectives of the policy, and the program/project. The identification of indicators were related to the objectives from planning documents, information requirements by management and environment themes such as water, environment health, agriculture, forestry, etc., to ensure that indicators are directly relevant to the issues being monitored and based on clearly understood linkages between the indicator and the phenomena under consideration. Therefore, the environmental indicators identified and selected for M&E system are related to Rwanda’s planning goals, objectives or targets. They are also relevant to the issues identified in each theme. The indicators will obviously need to be relevant to Rwanda. This has been assured by the identification of indicators from the planning process framework of Rwanda, the management information requirement and relating the indicators to the environment issues obtaining in Rwanda, around which the indicators are being developed.

**Reliable, stable and consistent**

The results from an indicator should be replicable by different researchers using standard and scientific methods. The methods should be stable over time and as valid in as wide a circumstance as possible.

**Be direct and unambiguous measure of progress**

The indicator is a direct and unambiguous measure of progress.

**Sensitive to changes**

Indicators should be able to reflect small changes in those things that the actions intend to change. They should be able to provide timely information that is sensitive to change. The indicators should also be related to various goals and objectives and can vary across groups and over time.

**Indicator easy to access, understand & communicate**

The indicator has to be easily interpreted, access and clearly understood by those who generate them and the users. The variations in the direction of change of the indicator over time should be clearly understood by policy decision makers, other stakeholders and the wider public, in terms of an improvement or deterioration in environmental performance at the local, regional, national and international level as appropriate.

**The indicator not easily manipulated or blown off course by unrelated developments**

The indicator is transparent and cannot be manipulated to show achievement where none exists.

**The indicator measure or highlight the impacts on children and other vulnerable groups**
This criteria is necessary to ensure that the M&E system also takes account of vulnerable group of the society which is most affected by environmental impacts.

2.3.4 The existing poverty-environment indicators

Figure 2 above shows that existing poverty–environment indicators have been identified from national, sectoral and district plans and the stakeholder information management requirement. Existing information are important sources for monitoring and evaluation indicators for output, outcome and impact of policies, programme and projects. The existing indicators have been come from various sources including national plans(MDGs, EDPRS), sectoral strategic plans and reports, district development plans and IMIHIGO,SOE, information required by the management, including on-project project reports,

The priority of Rwanda in developing poverty-environment, therefore, is to review the plans and information requirement by Management to identify existing indicators that are currently available. This important because they are not costly because most of them have data already available or are soon to be available. The consultant was able to collect existing poverty-environment and organised them by impact, outcome and output indicators. There are 23-impact indicators 41-outcome indicators and 114 output indicators (Annex6).

2.3.5 The selection of Poverty-Environment indicators

The identified indicators are defined by their names but few practitioners and decision makers know what they are supposed to measure and for that reason do not understand them. The latter may limit the use of information from indicators to solve environmental problems and can also lead to taking wrong decision with no or wrong impact on the environment issues concerned. It has been pertinent, therefore, to make effort to define what each indicator is supposed to measure. Using the selection criteria as presented bellow; the selected of key leading indicators are presented in Annex7 shows the selected indicators with definition of what they are measuring and source of data and likely source of data for indicators which do have data. These poverty-environment indicators will be presented in a workshop for stakeholders not only to review, discuss the indicators but also to agree on their definitions (Names) and what they are supposed to measure. The results from the workshop will be used to validate the poverty-environment indicators.

2.3.6 The selection of Key leading Poverty-Environment indicators

Among the developed indicators, there are indicators that have data and one can their tress source of data. Most of the indicators, however, have incomplete data and others have no data at all and require collecting data on them. Box 3 bellow shows the poverty-environment indicators with data, incomplete and without data. It is, however, important to limit the number of poverty-environment and bring them to a manageable list without compromising important information needs for decision making in the environments. While Annex 7-show selected indicators, the list of indicators showed bellow gives a manageable list of Key leading Poverty-Environment indicators that can meanwhile be used for monitoring and evaluation while effort is going to be taken to collect data for indicators with no data. The key leading Poverty-Environment indicators includes indicators with incomplete data. They are included because they are indispensable for monitoring and evaluation of environment and natural resources. Most of the indicators with incomplete data and without data are those directly related natural resources and this calls for urgent action to collect the information for effective management of environment and natural resource sector.
Box 3-: Key Leading Poverty-Environment Indicators

1. Impact indicators

Indicators with data source

1. GDP growth rate
2. Share of population living below poverty line (%)
3. Economic inequality (Gini coefficient of consumption)
4. Share of population living in extreme poverty (%)
5. % Poverty incidence among people living in female-headed households
6. Per capita real income among rural households
7. % Increase in the share of rural population below national poverty line
8. % increase of population with minimum food requirements.
9. Prevalence of diarrhea
10. Annual death rate from malaria among under-fives & pregnant women
11. % of total population who are food insecure
12. % increase in per capita income among rural households
13. Incidences of deaths, illnesses or loss/destruction of property due to floods, landslides or drought
14. Incidences of malnutrition among under-five year olds
15. Infant mortality rate
16. Under 5 mortality rate

Indicators with Incomplete Data

17. % contribution of natural resource exploitation to national economy
18. Annual fuel wood consumption as a proportion of total standing volume
19. Water availability
20. Soil loss (in t/ha/year)

2. Outcome indicators

Indicators with data source

1. % GDP growth for all crops, livestock products
2. Incidences of water-borne diseases among under-five year olds
3. Incidences of malaria among women and young children
4. % of protected areas with biodiversity preservation
5. Decrease the emission of greenhouse gases in the atmosphere (CO2,CH4,NO2)
6. Rwanda land use per household per hectare
7. % surface area covered by forest
8. % of forests managed through collaborative arrangements with local communities
9. % of bare (degraded) hills planted with trees
10. Percent of residents using traditional fuels
11. % of households & industries using fuel wood as a source of energy for cooking
12. Energy use per unit of GDP
13. Proportion population using solid fuels
14. % of household accessible to alternative energy suppliers (Methane, biogas, peat, solar, electricity)
15. % of households using energy saving stoves
16. % of agricultural land protected against soil erosion
17. Area (in Ha) of bare (degraded) hills planted with trees & soil stabilizing grasses
18. Average time spent by women & children collecting water
19. % of poor Households within 30 min of functional safe water source;
20. % of people with access to safe water
21. % of urban and rural population accessing sanitation services
22. Quantity of water used per capita per day
23. Proportion of household income spent on water
24. % of rural households with access to functional latrines
25. % of population with using hygienic and sanitation facilities
26. % of households with access to adequate sanitation facilities
27. % of under-fives who are underweight
28. % of rural children under 5 years who are stunted
29. % of household income from agriculture & livestock
30. Land productivity (tones of food / ha/ annum)
31. No. of households and enterprises with access to electricity

Indicators with Incomplete Data

32. Area of land protected to maintain biological diversity
33. % decrease in the consumption of firewood through the use of improved cook stoves
34. Percentage of households using more efficient wood-based technologies for energy
35. % of irrigation & other water-intensive projects that have been subjected to environmental impact assessment
36. Proportion of arable land that is protected from erosion
37. Proportion of wetlands that is protected from intensive human activities
38. Quantity of annual household consumption that is derived from forest products
Box 3:- Key Leading Poverty-Environment Indicators- continuation

3. Output indicator

Indicators with data source

1. Radical and progressive terraces (ha)
2. % of natural forests protected and conserved (buffer zone) to facilitate tourism
3. % of riverbanks and lakes protected by tree belts
4. % critically degraded ecosystems mapped, assessed and rehabilitated
5. No. of households and enterprises with access to electricity
6. % of people in urban areas with access to and using safe water
7. % of people in urban areas with access to and using safe water
8. % of people in rural areas with access to and using safe water
9. % of population with access to safe (clean) drinking water (within 500 meters in rural areas and 200 meters in urban areas)
10. Number of km of safe water infrastructure network developed
11. Number of improved water source developed per year
12. Number of recycling centres for solid waste developed and operational per year
13. Number of km of sanitation infrastructure network developed
14. % of farm households using Organic fertilisers
15. % of farm households using insecticides
16. % of rural households within 500 metres of an improved water source
17. % of relevant policy, legislation and institutional frameworks established and operational
18. Existence of operational land registration services at district & sector level
19. Sensitization meetings held on land tenure (annually)
20. Local leaders trained in land dispute resolution
21. Sensitization on access to credit services
22. % of Agricultural sector budget that is spent on soil conservation activities
23. No. of collaborative forest management agreements signed & implemented
24. No. of tree nurseries established (at cell & sector level)
25. No. of biodiversity awareness & conservation trainings held
26. No. of trainings in community based natural resources management
27. % of degraded wetlands rehabilitated
28. No. of Water User Committees (WUCs) formed
29. % of WUCs with O&M budget
30. % of WUCs headed by women.
31. No. of functional safe water sources
32. % of farmers practicing soil conservation technologies
33. % of HAMS in schools and PHAST in imidugudu actively functioning
34. % of schools with latrines as per standards
35. % of health centres with latrines
36. Number of public latrines with the hygienic standards in the public area
37. % of publics latrines with hygienic standards in the public institutions
38. % of km of rainwater drainage increased in urban area
39. % of public buildings with rainwater catchments
40. Local Government budgets set aside for waste management
41. No. of public waste management sensitization meetings held in urban area
42. Operational drainage systems in urban areas
43. No. of slum improvement projects implemented
44. No. of Public-private partnerships in solid waste management initiated & operational
45. % of local governments with byelaws or ordinances on solid waste management
46. Trainings held on Cleaner production
47. Municipal & solid waste management plans
48. No. of sensitization meetings held on environmental disasters
49. % of people living in slum areas
50. No. of Households who have been rendered homeless or lost property due to floods & landslides
51. Total value (in Frw) of property lost or destroyed by floods & landslides
52. No. of human deaths or injuries due to floods or landslides
53. % of National (or district) budget spent on disaster mitigation
54. % reduction in the period for approval period for EIA certificate per project
55. % of wood used as fuel by major users such as industries and community cooking replaced by peat
56. % of enterprises with EIA certificates
57. Existence & implementation of pro-poor policy & law on wetlands
58. % Mean daily caloric availability/ intake per person
59. Annual per capita food production
60. Per capita rural crop production
Box 3:- Key Leading Poverty-Environment Indicators- continuation

Out put Indicators with Incomplete Data

61. % of hilly areas which have been terraced or under soil conservation
62. Area of land sustainably managed against soil erosion and made productive through irrigation
63. % of women and vulnerable groups engaged in forestry and agro-forestry
64. % of Infrastructure (roads, bridges, schools, hospitals, etc) protected against runoff using vegetation cover
65. Reduction in annual wood consumption (million cubic metres)
66. % of area of the land protected to maintain biodiversity
67. % of farm households using Inorganic mineral fertilizers
68. Comprehensive land evaluation / suitability assessment report
69. % of land mapping conducted to establish productivity potential
70. % of wetlands inventoried
71. Proportion of wetlands conserved/ sustainably used
72. % of water spring catchments protected according to national standard
73. Area/ length of lakeshores and river/ stream banks protected or sustainably managed (Km2 or Ha)
74. % of farmers with access to and using inorganic & organic fertilizers
75. Use of rainwater harvesting/ water conservation technologies
76. % of households and institutions with access to solid waste management facilities in urban area
77. % of households and public institutions with access to solid waste management facilities in rural area
78. % of poor households with appropriate provisions for disposal of children’s faeces
79. % of people with knowledge of basic sanitation & hygiene behaviour
80. % of households with hand-washing facility
81. % of rural households with hygienic latrines
82. % of people with knowledge and/ or awareness about transmission of diarrhea diseases.
83. % of households with rainwater catchments systems
84. Inventory/ database of Settlements in wetlands & steep hills
85. Existence of Resettlement plan & approved budget for people in wetlands and steep hills.
86. % of institutions having mainstreamed environment in sector policies, strategies & monitoring systems at both central & local levels
87. Invasive non-native species that are threatening to ecosystems, habitats, or species
88. Number of projects compliant to national environmental standards

2.3.7 Disaggregation of Poverty-Environment Indicators by Environment themes and by Administrative levels

2.3.7.1 Disaggregation of Poverty-Environment Indicators by environment themes and environment issues

Box 2 above shows environment issues disaggregation by environment themes. Annex 9 shows poverty-environment indicators disaggregated by the environment issues that needs monitoring and evaluation. The latter disaggregation completes the necessary links for indicator development. The indicators are developed with the purpose of monitoring and evaluating the performance of environment issues.

2.3.7.2 Disaggregating Poverty-Environment Indicators by administrative levels

Annex 7 shows disaggregation of Poverty-environment indicators by administrative levels. The indicators are disaggregated by national, sectoral and district levels. This disaggregation shows also the institutions that are responsible for the indicators. The following are advantages for disaggregating indicators by administrative levels:

- The disaggregation of poverty-environment indicators by administrative levels relates monitoring and evaluation indicators to information requirement by management at each level of administration. However, the districts require more than environment related information. They require also information on social- economic aspects of the society and this information is important also for
district planning purposes. That is why, the designing of questionnaire to guide collecting data at local and district levels needs to be all inclusive by integrating questions on social-economic aspects at the local community-level. This is not surprising, because there is close relationship and interaction between environment, social and economic aspects of the society (Figure 3). Poverty-environment indicators can measure more than one part of whatever parameter is being analysed. The latter is a phenomenon that differentiates poverty-environmental indicators from the traditional economic, social and environmental indicators.

Figure 3: The interactive systems for poverty-environment indicators

- It promotes accountability by showing institutional responsibilities. The responsibility varies from data collection to data analysis and reporting. It is important to highlight, that most data on poverty-environment will be collected at local community level.
- It will help the implementation of M&E system and its follow-up

2.4 Data collection mechanisms, the pilot data collection for poverty-environment indicators, data analysis and reporting

2.4.1 Existing data collection mechanisms

The design of M&E for environment has to answer what data and information to be collected, when they collect them, how it is collected and by whom. Rwanda has various data collection mechanism, mostly organised at national and sectoral levels. Data collection mechanisms for M&E system involves existing data collection mechanisms and establishing data collection system at local community level in the districts. The following are existing data collection mechanisms and type of data being collected.

- Demographic and Health Survey (DHS): The Demographic and Health Survey collects wide range of data including data on household characteristics, women’s fertility, children and nutrition,
infant and child mortality and vulnerable groups such as orphans and children. The DHS is one of
good source of environmental health indicators such as infant mortality and child mortalities,
nutrition and diseases indicators such as diarrhea. The DHS is conducted the National Institute of
statistics (NIS).every after five years.

- The Household Living Conditions Survey (EICV): This an important source of poverty-environment
data and information relate to poverty and inequalities, land tenure issues, agricultural production,
economic activities and employment and source of income, demographic changes, accesses to
services like water and sanitation, education, health and infrastructure. The EICV is done annually.
- The Core Welfare Indicators Questionnaire (CWIQ): The CWIQ collect data on households’ living
conditions and use of public services, and is conducted annually by National Institute of Statistics.
This exercise is done annually.
- The Multiple Indicator Cluster Survey (MICS): The objective of is to gauge the impact of
investments in education, water, and health (nutrition). Therefore the MIC collects data on
education, water supply and nutrition.
- Agricultural surveys: It collects data and information on characteristics of households, land size, use
of agricultural inputs such as fertilizer and agrochemicals; agricultural and livestock production;
availability of food per capita and per year; contribution of crops to nutrition and data on animal
inventory and meat consumption.
- Agricultural and livestock census: This is done bi-annually by MINAGRI to assess the types of
crops and livestock availability/population.
- The Food Security Survey: It collects data and information on crop production.
- Public Expenditure Reviews (PER): collects data on budget and resources allocation on priorities.

The foregoing existing data collection mechanisms are formal sources of data and information and except
for public expenditure reviews, they are based on surveys and scientifically determined methodologies.
However, there are other sources of secondary data and information on poverty-environment indicators such
as studies, UNICEF and WFP, ministerial and district plans, annual and quarterly reports, joint sector
review reports and several meeting reports that may have information not supported by that is scientifically
collected. Annex----- shows existing poverty-environment indicators.

What is evident is that poverty-environment indicators exist in the various survey documents, studies and
ministerial and district plans and reports. They are not limited as it is usually perceived\textsuperscript{13}. Nevertheless, the
poverty-environment indicators have not been isolated, organised and set aside as poverty-environment
indicators. Secondly, with exception of data from the surveys and to a limited extent the studies, most other
monitoring and evaluation indicators are not scientifically collected, therefore, compromising their quality
and accuracy.

2.4.2 The Karongi Pilot Data collection

The Karongi Pilot data collection exercise was started in 2008 and data collection was completed in
September, 2009 and arrangement to start data analysis is underway. The questionnaire for data correction
covers all aspects on community life in the district. There are questions in respect to the community
/community level questions) covering background information and community life. The background
information is limited to administrative levels that are umurange, Akakari, Umudugudu (village).The
background would have been more enriched if information on the population size and types of the

\textsuperscript{13} REMA Poverty-Environment Indicators, March, 2007.
administrative levels and community services such as existence of roads, markets infrastructures, electricity and water. The latter, however, is not limiting for data analysis as the questionnaire was directed to collect data at individual family level in regard to individuals household characteristics, demographic data, employment, health and nutrition, agriculture and livestock, forestry, soil erosion and soil conservation, education, reproduction, availability and use of drinking water, means of cooking and lighting, waste management, sanitation services, environment destruction and its impact and land issues.

REMA trained data collectors from district to akagali and this indispensable capacity building for the sustainability of data collection in the district. It is advisable to do it also in other districts.

2.4.2.1 Data analysis and consolidation of data at various levels of administration (district, and national/sector level)

2.4.2.1.1 Background issues to data analysis

The data collected in Karongi district is indispensable source of poverty-environment indicators. It has been noted that a lot of data collected but there has been limited data analysis and consolidation. Particular attention has to be paid to doing it right for the analysis of Karongi data. The aim of this data collection is to put in place a structure to generate a baseline data and information on environment situation on poverty-environment indicators and social—economic indicators with twofold objectives, namely:

- Establishing a structure to generate baseline data and future update of poverty-environment and social-economic indicators
- To diagnose the existing situation for the purpose of planning and programming in the district(s)

The data analysis needs to be done at the two levels; the district levels the sector levels. Credible results of data analysis at district and sectoral level (REMA) are both indispensable for developing poverty-environment indicator at district level and consolidated at REMA (sectoral) and as a pilot successful data analysis for this pilot will be precedence for future effective data analysis. However, successfully data analysis will depend on capacity to analysis and consolidate data at the district at district and REMA. The district has a statistician but does not have adequate skills for data analysis and all evolved in all other district activities. There is needs support the district with data analysis skills in terms of short term consultancy( six months) to help data analysis plan, do preliminary data analysis and processing to determine the results from data analysis. The capacity to analyse and process data in REMA is also lacking and a consultancy in data analysis is need for not less than six months.

Data and information from field forms have to be feed into a district and REMA servers before they are analysed. REMA, besides the district, receives data from the sectoral and national policy and planning framework and reports (figure 4). The data collected is a lot and one has to carefully not to under analysis the data with resultant weak conclusions (general analysis) or over-analysis data, whereby the data is fully analysed, which can take long term to have results. Therefore, to ensure straightforward and useful analysis, a balance has to be found between the quality of data and information needs of the district and REMA. In this case, attention will have to be taken to ensure the following:

- The district and REMA will have to make a clear the information requirements and data analysis will have to focus and be limited to the required data.
- Not to over analysis less precise qualitative data and under analysis the economic data which usually has precise data.
There is no need for sophisticated manipulation of data for unimportant phenomenon which could be understood when time is given from well organised and tabulated data. Therefore, common sense and logical reasoning will have to prevail and to avoid sophisticated statistical manipulation in this respect.

In case for planning and programming purposes, which requires in-depth diagnoses, requires considerable care in the analysis. Even then care has to be taken to ensure that only major tendencies in the communities are needed.

Figure 4: Source of and data analysis framework
2.4.2.2 Types of data analysis expected for Karongi data

There two types of data analysis expected from the collected data for Karongi district, namely; descriptive analysis and explanatory analysis.

Descriptive Analysis

In descriptive analysis attention needs to be paid on the following:

- Displaying of data variable by variable to come up with a complete picture on the distribution of communities and individual households.
- Identification of frequency of individuals falling into each category of variables. The tabulation variables will have to be tabulated and converted into percentages.
- Identification of community characteristics in terms of central tendencies (the average, the best and worst communities) In this case, the frequency distribution data will is needed and will have to be done for each relevant variable. In some cases, particularly at community level some data may not need weighting and data can simply be organised by type of services and converting figures in percentages.

Explanatory analysis

The descriptive analysis is the most immediate requirements to understand individual and community characteristics. However, for planning and programming purposes, explanatory analysis is needed to understand the cause-effect for the results. This purpose of explanatory analysis, therefore, is to determine why the results obtained in descriptive analysis have occurred. The explanatory analysis also makes possible to explain fully issues which are of particularly interest to planners and administrators. Explanatory analysis pays attention to the following:

i. Planning the analysis

Planning the analysis is a panacea for efficient and effective analysis and important to avoid any occurrence of under-analysis and over-analysis. The planning of analysis will have to pay attention to the following:

- Ensure a balance between the desire to investigate all aspects district and REMA operations and information requirement and time available for analysis. While the extend of analysis may be determined by the nature of questionnaire (in this case requiring detailed analysis), the objectives of data collection needs to prevail to ensure focused analysis.
- Determine the structure of relationships among the variables
- Ensure procedures to guide the tabulation analysis and writing of analytical report. The people responsible for data analysis will have to make data analysis plan for the explanatory analysis to ensure focused analysis. Data analysis plan requires determination of necessary analysis required, the data processing require and writing of reports and the later is determine by when the reports are needed and by whom. The following tabulation can help to structure the tabulation analysis.
### Table 1: The tabulation analysis plan for explanatory data analysis

<table>
<thead>
<tr>
<th>Necessary analysis required</th>
<th>Data processing required</th>
<th>Writing of reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
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<tr>
<td>2.</td>
<td></td>
<td></td>
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<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Etc,</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### ii. Determining the relationships among variables

This analysis requires doing the following:

a. Rank-order correlation. The latter involves reducing the number of variables by discarding e input variables which do not show a relationship to output

b. Cross-correlation (joint frequency tabulation). This involves classification of a sample in terms of one variable and subsequent comparison of results on other variables. Important is put in place the criteria for classification of variables. In presenting cross-tabulation, the following precautions are necessary:

   i. The direction in which a table is percentage implies a causal relationship. Causing factors may be more than one but one of them is supposed to be the primary cause factor. Therefore, care must be taken to decide well on the causing factor. This is why the analyst must take care that the percentages make logical, as well numerical sense

   ii. Test possible associations and eliminate independent (causal) variables until a set of potential explanatory variables are determined.

   iii. The analysis should only be done where the sample is large and when there is need to determine which of the variables is independently linked with given results.

Given the foregoing requirements for data analysis, one can conclusively say that the analysis requires developing a structure for your analysis, based on one’s intuitive understanding of emerging themes and concerns; going through data, organizing it under the themes (categories and concerns); identifying patterns, possible trends, and possible interpretation and making conclusions and recommendations.

### 2.4.2.2.3 Data and information consolidation or information packaging

There are four levels of decision making, namely; national, sectoral, district and community levels. The consultant recognises that the four levels of decision making require different information for decision making. These different information requirements demand data and information consolidation or packaging. Using the concept of logic framework, the information required and poverty-environment indicators that go with it at all the four levels are related to the goals, objectives, outcomes, outputs and inputs produced from the implementation of policies, programmes and projects. The national management level requires information related to goals (impact) and on certain objectives ((outcomes (effect) while the sector level requires information on the objectives of the sectors and some outputs from implementation of large programmes. The district level requires much more detailed information on outputs or goods and services produced by implementing the policies and programmes in their district. The district also needs social-economic situation in the district. The communities need information on inputs they would need to use to implement the programmes/project activities but also information on community life (including socio-economic services, e.g. education, health, agriculture, water, etc.). Annex5 shows the type of information that may be needed by different levels of management. The figure5 below shows the relationships among
management levels, the causative linkages among impact, outcome, output and inputs, the poverty-indicators.

**Figure 5: The relationship of management level goals, objectives, and outputs, activities with causal sequence linkages among impact, outcome, output and inputs**
The vertical relationship shows how the implementation (transformation) of activities and use of inputs leads to achievements of outputs in terms of goods and services generated by utilization of inputs (Financial and physical resources). The outputs produced and used makes possible to have effect on achieving the outcome or the objectives planned and giving chance for people to have access, usage of the goods and services produced at the output level. For instance the availability of clinics and trained staff makes it possible for the mothers to take advantage (change attitudes about the clinics) of the services available to increase visits to clinics and in event there is in the increase in the % of Mothers make Pre-Natal Visits to Clinics. The increasing number of mothers visiting clinics will lead to improved welfare of mothers and children through % reduction in infant and child mortality, prevalence of disease such as diarrhea and thereby achieving the national goal.

What does the different information requirements and the causative linkages among activities/inputs, outputs, outcomes and impact and relationships with the four administrative levels mean for data consolidation? The collected data and information is available at district and REMA (representing sectoral and national levels). The data analysis and processing is to be done at the two levels. During the analysis and processing, the analyst(s) will have to take account of the following:

- Planning the scope of analysis and desired out results to take account the different information requirement at each administrative level
- In case of poverty-environment monitoring and evaluation indicators, the interpretation of the results in terms of measuring monitoring progress and evaluating performance will have to be linked to desired goals, objectives, targets achievement (EDPRS, Strategic plans, DDPs and IMIHIGO). The following figure illustrates this linkage:

**Figure 6: Linking data analysis and processing with goals, objectives and target achievements**
- The framework for application of computer-based data analysis and processing data collected from district and other sources for Managing Monitoring and Evaluation system
- The structure of managing the monitoring and evaluation information system

The M&E system designed is an integrated monitoring and evaluation system involving all districts, cross-sectors ministries and agencies dealing with environment, MINECOFIN and also information users such as NGOs working in environment. This type of M&E system requires an integrated systems or methods to facilitate data analyses and processing. The structure of M&E data management system will have to receive and send information not only from districts (collected data) but also information will come from environment cross-sector ministries, MINECOFIN (the institute of statistics), UNICEF, WFP and from projects under implementation from the cross-sector ministries, ministry of environment and natural resources and REMA. An appropriate data analysis and processing system(s) or method(s) is needed to facilitate analysing and processing all collected data. Whichever the system, it has to facilitate the planning, continued data collection, controlling, monitoring, evaluation and support and facilitate necessary reporting.

Chart 1: The Structure of Managing the Monitoring and Evaluation Information System
The M&E management system envisages that units of data for indicators will be standards for all the institutions concerned and these institutions will come together to agree on the poverty–environment indicators (their definition, what they measure and standardisation of unit of measure). They will also have to agree on the types of reports and reporting frequency. The system encourages sharing of information among the institution planning and implementing, monitoring and evaluation of environment related policies, programmes and projects. It also allows capturing programme and project monitoring and evaluation data and information. However, the latter to be possible there is need to design also project related monitoring and evaluation either as a standard alone system or as a subset of the general M&E system. In either case different software will be needed for project M&E system. The M&E system is a part of MIS of REMA and linked to it.

2.4.3 Methods and Tools to facilitate data analysis and processing

There are three methods data analysis can be performed depending on the magnitude of data collected or the results expected by the management. The three methods are:

- Analysing data by Manual method
- A combination of manual system and computerised system
- A fully fledged computerised system

Table 2: The following are characteristics of the systems (methods)

<table>
<thead>
<tr>
<th>Types</th>
<th>Conceptual requisites (common to all systems)</th>
<th>Capital requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Manual system</td>
<td>• Clear Concept</td>
<td>• Substantial human resources</td>
</tr>
<tr>
<td></td>
<td>• Objectives in line with organization’s goals</td>
<td>• Larger amounts of space and time</td>
</tr>
<tr>
<td></td>
<td>• Personnel with defined roles and responsibilities</td>
<td>• Greater need for mobility and means of transportation</td>
</tr>
<tr>
<td></td>
<td>• A Set of procedures</td>
<td>• Means of conventional communication</td>
</tr>
<tr>
<td></td>
<td>• M&amp;E tools appropriate for the system</td>
<td>• Writing material and stationery</td>
</tr>
<tr>
<td></td>
<td>• Information management and communication mechanism</td>
<td>• Appropriate filing and referral system</td>
</tr>
<tr>
<td>2. Semi-computerised/Automated System</td>
<td>• A value system that encourages participation at all levels among stakeholders</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Means of conventional as well as electronic communication</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Centralized Computer system or PCs with necessary aids and paraphernalia</td>
<td></td>
</tr>
</tbody>
</table>

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3. Fully-computerise/Automated System

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
|  | • Material and stationery for writing both by hand and with machines (typewriter, word processor or a computer  
  • Moderate need for maintenance and security of both hardware and software  
  • Higher needs for power consumption |

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
|  | • Moderate human resources with specialization in information technology  
  • Moderate amounts of space and Time  
  • Moderate need for travel  
  • Modern, fast and sophisticated means of communication such as through satellite  
  • Computer equipment and network with facility for electronic data base or MIS  
  • Material, stationery and computer aids, paraphernalia and consumables  
  • Greater need for equipment maintenance and security  
  • Greater need for information security and protection from misuse.  
  • Higher needs for uninterrupted power supply and consumption |

The M&E system proposed a semi-computerised system to be used for data analysis and processing. In this system it analysts will be able to use both manual and computerised system and system is relative less costly and flexible compared to the fully fledged computerised system. The manual system alone can not be used because the amount of data to be handled is large and the analysis process is complex.
2.4.4 The reporting system and communication of M&E findings

2.4.4.1 Reporting on the findings of Karongi pilot data collection, analysis and processing

The collection of data, analysis and processing of data is not an end of monitoring and evaluation process. The exercise of monitoring and evaluation is not complete until the findings of data analysis and processing are communicated to relevant decision makers. In order for monitoring and evaluation to have value the users of information will also have to act on the information that comes out of the analysis of data collected and make feedback to the supplier of monitoring report(s). However, the feedback depends on the following factors:

- The presentation of the M&E findings and indeed the M&E report must be capable to attract the attention of decision makers. This is important because it determines not only the understanding of the findings but also facilitates quick decision making and feedback.
- The accuracy of data in the report; decision makers particularly in the district and REMA, the ministry of environment and natural resources will need to have confidence of accuracy of data presented in the report.
- Whether the findings of the M&E report show possible alternatives for future action

The data analysts at district and REMA, after coming up with their findings, conclusions and recommendations will have to report district and REMA management respectively. The district management will report to REMA on the results and REMA will make feedback to them. Since REMA will be doing data analyse on the pilot data collected, it will report the results to all stakeholders in the environment and get also feedback from them (Chart 1).

2.4.4.2 General M&E Reporting and Communication System

(i) The conceptual framework for M&E reporting and communication

The conceptual framework for M&E reporting is that REMA will not receive the poverty-environment indicators itself, analyse them and present the findings to its stakeholders. The M&E system ensures that poverty-environment indicators are identified and dissagregated by national, sectoral ministry and by district levels. The indicators, therefore, are analysed and reported within the framework of cross-sector ministries, the districts and REMA. The M&E system advocates an agreement among all stakeholders on the indicators, what is to be reported, to whom and the reporting frequency. REMA therefore will be one of the USERS and SUPPLIERS of M&E information but more so it is a user of environment information from stakeholders implementing environment policies, programmes, projects and those who conduct studies or collect and analyse environmental data.

Internally, REMA produces it own information and reports on its mandate. It will, as pointed out, be carrying out analyses on the data collected from the district. REMA, as much as it will be receiving information from external (its stakeholders), it will also supply information to them (Chart 1) and but also will be making feedback on M&E information it is receiving.

Monitoring and evaluation of environment to serve as a tool of decision making will have to provide information that is relevant to the progress and performance situation about the environment. The interpretation of information(results) from analysis of poverty-environment
indicators ought to be linked to goals, objectives, outputs and planning targets of institutions working in environment sector in order to assess achievements, gaps and constraints, challenges and to suggest future way forward to improve the results (figure 6). The following are other factors to make M&E system to be effective and functional:

- Quick and regular reporting is done and feedback received; the findings need to be reported promptly and speedy feedback done to facilitate decision making. A delay in reporting lowers the potential influence of monitoring and evaluation to decision making.
- Information synthesized and disseminated to cross section in and outside
- Information and analysis ploughs back into the planning regularly

(ii) Reporting mechanisms: the types of reports

Management is not simply interest in data but information processed from the data and how that is communicated in form of reports. Reporting M&E progress and performance will be realised through preparation of various reports. Annex 5 shows information requirements at various administrative levels and types of reports. Since monitoring and evaluation is by all institutions in the environment sector, particularly the sectoral ministries in the cross-cutting sector, the ministry in the environment and natural resources districts and REMA. The institutions will produce various written reports that will be shared among the institutions. Table 3 below shows a few important reports which REMA and other institutions have to produce and disseminate to get clear performance of environment:

Table 3: Major reports on performance of environment

<table>
<thead>
<tr>
<th>Administrative level</th>
<th>Type of Report Required</th>
<th>Frequency of Report</th>
<th>Origin of report</th>
</tr>
</thead>
<tbody>
<tr>
<td>National level</td>
<td>EDPRS monitoring and evaluation reports</td>
<td>Annually and quarterly</td>
<td>Sectoral ministries, Authorities and districts</td>
</tr>
<tr>
<td>DHS reports</td>
<td></td>
<td>Every 5 years</td>
<td>MINECOFIN’S Institute of statistics</td>
</tr>
<tr>
<td>EICV survey reports</td>
<td></td>
<td>Bi-annually</td>
<td>MINECOFIN’S Institute of statistics</td>
</tr>
<tr>
<td>Programme/project implementation and evaluation reports</td>
<td></td>
<td>Annually and quarterly</td>
<td>CEPEX</td>
</tr>
<tr>
<td>The state of environment</td>
<td></td>
<td>Bi-annually</td>
<td>REMA</td>
</tr>
<tr>
<td>Sectoral Ministries</td>
<td>Sectoral EDPRS reports</td>
<td>Annual and quarterly</td>
<td>Sectoral ministries</td>
</tr>
<tr>
<td>Ministries’ and performance reports</td>
<td></td>
<td>Annual and quarterly</td>
<td>Sectoral ministries</td>
</tr>
<tr>
<td>Project implementation progress reports</td>
<td></td>
<td>Annual and quarterly</td>
<td>Project managers/ coordinators</td>
</tr>
<tr>
<td>Agricultural survey</td>
<td></td>
<td>Bi-annually</td>
<td>MINAGRI</td>
</tr>
<tr>
<td>Agricultural census</td>
<td></td>
<td>Annually</td>
<td>MINAGRI</td>
</tr>
<tr>
<td>Institution</td>
<td>Activity Description</td>
<td>Frequency</td>
<td>Key Reporters</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------------------------------------------------</td>
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<td>------------------------------</td>
</tr>
<tr>
<td>REMA</td>
<td>The state of environment</td>
<td>Bi-annually</td>
<td>REMA</td>
</tr>
<tr>
<td></td>
<td>Programme/project implementation and evaluation reports</td>
<td>Annually and quarterly</td>
<td>Sectoral ministries, REMA</td>
</tr>
<tr>
<td>Districts</td>
<td>District IMIHIGO reports</td>
<td>Annual and quarterly</td>
<td>Districts</td>
</tr>
<tr>
<td>Districts</td>
<td>District data analysis reports</td>
<td>annually</td>
<td>Districts</td>
</tr>
</tbody>
</table>

The communicating of M&E information is to be done by written report but communication which should increasingly be use is by websites to make accessibility to the reports much easier and to speed decision making. Data and information have to be analysed and synthesised translated of and translating into simple graphical and other user friendly formats such as pictures, into figures, graphs, photographs, for management and leaders of decentralised structures and household stakeholders. In case websites, publishing reports on websites has to be regularly updated to be useful and effective.

Presentation of information in the reports can also be done verbally, with increasing use of mobile telephones, by power points particularly for training purposes and using videos. There is need for packaging information for each user in a suitable form aimed at obtaining support for both monitoring and evaluation of environment issue in their sectors but also ensuring that M&E information on poverty-environment indicators is regularly ploughs back and integrated into their planning process.

2.5 The M&E Implementation framework and making the M&E System functional

2.5.1 Institution roles and capacity building

However, having an organizational set up for M&E system does not imply that the M&E function is taking place and is ensuring that REMA receives information place to meet its information needs. An effort is needed to make the M&E system is effective and fully functional as to reap the real benefits of the system. Fist of all it requires giving responsibilities to the implementers of M&E system, in the process of developing poverty-environment indicators, effort has been made to show responsible institutions for every indicator (annex 7). Table 4 below shows a summary of roles of major institutions in monitoring and evaluation of environment.
Table 4: summary of roles of major institutions in monitoring and evaluation of environment

<table>
<thead>
<tr>
<th>Institution</th>
<th>Role and Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINECOFIN</td>
<td>Produce DHS and EICV survey reports</td>
</tr>
<tr>
<td></td>
<td>Give priority and Mainstreaming environment in EDPRS</td>
</tr>
<tr>
<td></td>
<td>Financial resource allocation to environment activities</td>
</tr>
<tr>
<td>Sectoral ministries dealing with</td>
<td>Priotise and mainstream environment in their polices and strategies</td>
</tr>
<tr>
<td>environment</td>
<td>Plan and implement environment activities</td>
</tr>
<tr>
<td></td>
<td>Integrate poverty-environment indicators in their strategic plans and action plans</td>
</tr>
<tr>
<td></td>
<td>Monitor and evaluate the performance of poverty-environment indicators in the areas of their jurisdiction</td>
</tr>
<tr>
<td></td>
<td>Reporting on the performance of poverty-environment indicators</td>
</tr>
<tr>
<td></td>
<td>Reporting on programme and project progress and evaluation</td>
</tr>
<tr>
<td>REMA</td>
<td>Coordination of compliancy of implementation of policies, regulations and laws on environment</td>
</tr>
<tr>
<td></td>
<td>Produce state of environment report</td>
</tr>
<tr>
<td></td>
<td>Facilitate and Follow-up mainstreaming environment in national, sectoral and district strategies and plans</td>
</tr>
<tr>
<td></td>
<td>Facilitate M&amp;E data collection, analysis and reporting</td>
</tr>
<tr>
<td>Districts</td>
<td>Priotise and mainstream environment in their policies and strategies</td>
</tr>
<tr>
<td></td>
<td>Plan (DDPs, IMIHIGO) and implement environment activities</td>
</tr>
<tr>
<td></td>
<td>Integrate poverty-environment indicators in their strategic plans and action plans</td>
</tr>
<tr>
<td></td>
<td>M&amp;E data collection, analysis and reporting</td>
</tr>
<tr>
<td></td>
<td>Report on implementation of IMIHIGO</td>
</tr>
<tr>
<td>NGOs</td>
<td>Implementation of some environment activities</td>
</tr>
<tr>
<td></td>
<td>Monitor and report on activities they implement</td>
</tr>
<tr>
<td></td>
<td>Funding some environment</td>
</tr>
</tbody>
</table>

The consultant advises REMA to organise meeting with all stakeholders to agree on their roles and responsibilities. Besides, role differentiation, for efficient and effective M&E system, there ought to be capacity building of all its personnel, equip them with necessary tools, provide resources and create cultural basis in the institutions for monitoring and evaluation of environment. A balanced combination of the above factors would create a working environment most supportive of M&E function. The institutions ought to find their suitable combination in relation to available resources and M&E requirement.

The M&E function should be looked upon as collective responsibility in the all institutions and adequate and well skilled personnel are needed in all institution to ensure M&E is functional. The following factors are important for strengthening capacity building:

i. Ensure that there are a unit or a person in charge of monitoring and evaluation of environment in REMA and ensure that cross sector ministries and districts have some one who follows up monitoring and evaluation of environment.
ii. Institute on job short term training on monitoring and evaluation
iii. Creating opportunities for advance training planning and project planning and management
iv. Create a culture of staff to work independently and delegation of higher responsibility in decision making and recognition of good work done
i. Since REMA is not responsible for implementation of most of environment activities, it is pertinent that it increases interaction among institutions and at all levels of management for experience sharing, building team spirit and to make them build a culture not only to be friendly with environment but also ensure sustainable monitoring and evaluation of environment.

In chart 2 and section 2.4.2.3 above reflects the Operating System for the M&E system. It was noted that a combined manual and computerise system is to be used for the M&E system. Most institutions have computers but halve gaps in equipment in areas of storing data (severs), report generators and experience personnel to operate data analysis and processing. It has been advised to recruit short term consultants in this respect

2.5.2 M&E implementation plan

The establishment of an implementation plan for M&E stem is one the indispensable factor to ensure its implementation. Table 5 below shows the implementation plan. The implementation for M&E system will take a bout 3 years and will close by the end EDPRS in 2012. The action plans aught to be discussed with all stakeholders not only to approve it but also to discuss its financing and solicit funding from the government of Rwanda and donors.
### Table 5: Implementation Framework Plan for M&E system for environment

<table>
<thead>
<tr>
<th>Activities</th>
<th>Years</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Month</td>
<td>De</td>
<td>F e</td>
<td>M A</td>
<td>P M</td>
</tr>
<tr>
<td>1. Training on M&amp;E system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Meeting of stakeholders to agree on poverty-environment indicators, roles and responsibilities, reports and frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Analysis, processing of karogi pilot data and reporting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Collect baseline data on poverty-environment indicators with no data by districts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Data analysis and processing districts and REMA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Production M&amp;E reports within the framework of ministries annual quarterly reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Updating of state of environment report by integrating baseline poverty-environment indicators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Challenge for the sustainability of M&E system

The implementation of M&E system and to make functional and sustainable will meet challenges that can not be solved by REMA alone but with the government and major stakeholders a cross sectoral ministries and agencies working in the environment sector. The following is a list of the challenges:

i. **To improve the measurement, standardization and understanding of poverty-environment indicators among stakeholders.** In order to have the indicators be used by all stakeholders, understood the same across the board, REMA has the challenge to improve the measurement, standardization and understanding of poverty-environment indicators among stakeholders. There is need to have an agreement among stakeholders in environment sector to discuss the poverty-environment indicators, particularly on their definition, what they are supposed to measure, how they are measured, bewitch are to given priority to update their baseline, collect data for those indicators with incomplete and with out data.

ii. **Quickly implementation M&E system implemented across sectors in environment.** REMA has a challenge to quickly to have M&E system implemented across all the sectors dealing with environment and districts. This first requires that environment issues be well integrated in their sector and district priorities, policies, strategies, strategic plans, action plans, programmes, projects and resource allocation. Unless this mainstreaming of environment is done it will be difficult to integrate M&E poverty-environment indicators in sectoral and district strategic plans and action plan live alone using them to monitor and evaluate the environment situation and performance.

iii. **Integration of poverty-environment indicators integrated in the national and sectoral strategies and plans.** This is not simple as it may seem because it requires to review the strategies and plans and support of all stakeholders and resistance may not ruled out in the process of undertaking this endeavour.

iv. **The funding of the implementation of M&E system.** Resources are needed to have data collected, analysed and processed, to build capacity in monitoring and evaluation not only in REMA but also in sectoral ministries and districts

v. **Establish regular data collection and analysis mechanism.** Establishment regular data collection and analysis mechanism to generate data on indicators is crucial for sustainable monitoring and evaluation system, This not only requires to have every one involved to accept their roles but also to come to agreement on M&E implementation plan, the resources and responsibilities for each stakeholder.

vi. **Ensuring information which is accurate and meet user’s information requirements.** The efficiency and effectiveness of M&E depends on whether it is able to satisfy the user’s information needs, information which is accurate and is available at the right time. The suppliers ought to have the capacity to generate that information while the users make quick feedback. This is not a capacity issue alone but also requires ensuring quality and accurate data and building monitoring and evaluation culture among all stakeholders. The success in this endeavour requires the confidence and support of high management in government, sectors and districts. The latter is possible only when their demand for information can be met and the information is related to their objectives and facilitates decision making in their areas of jurisdiction.

vii. **To have M&E information understood, used and feedback done.** It is one thing to generate M&E information and another thing to have it understood. The challenge is to have M&E information understood, used and feedback done. This requires adopting all even to establishing new and modern information communication mechanisms and building communication networks to ensure regular information sharing among stakeholders.
viii. Development of indicators that will be responding to new and emerging policy concerns. This necessitates greater policy relevance and increased quality and timeliness of basic data sets, as well as a closer link between environmental data and existing economic and social information systems. It also necessitates more work to document the indicators and complement them with information reflecting sub-national differences.

4.0 Recommendation

The following are recommendations on ensuring implementation and sustainability of M&E system for environment:

i. Improve the measurement, standardization and understanding of poverty-environment indicators among stakeholders. This will improve the quality and comparability of existing indicators. A meeting all stakeholders is needed to come to agreement on indicators.

ii. The poverty-environment indicators will need to have their definitions and measurement to continuously be refined.

iii. REMA and stakeholders will have to progressively improve the availability and quality of basic data sets of indicators with a focus on comparability within the country and among countries.

iv. Improve M&E reporting. This requires adopting all even to establishing new and modern information communication mechanisms and building communication networks to ensure regular information sharing among stakeholders.

v. Ensure timeliness in reporting, communication and feedback.

vi. Ensure continued linkage of poverty-environment indicators more closely to national sectoral goals, objectives and international commitments both in terms of development and reporting to get confidence and feedback from stakeholder decision makers. This also requires a closer link between environmental data and existing economic and social information systems.

vii. Strengthen the use of indicators in policy evaluation and environmental performance reviews.

viii. Implement the M&E system as quickly as possible to get the benefits of monitoring and evaluation.

ix. Promote and ensure environment issues are well and fully mainstreamed in national, sector and district priorities, policies, strategies, strategic plans, action plans, programmes, projects and resource allocation to facilitate integration and implementation of poverty-environment indicators.

x. Ensure availability of financial resources to purchase equipment and recruitment of short-term consultants to facilitate data analysis and processing.

xi. Strengthening capacity to collect, analyse and process, consolidate, utilise and feedback of information.

xii. Strengthening of capacity building in M&E in REMA and across sectors dealing with environment and districts through facilitating recruitment of experienced and skilled personnel and promoting on job training and long term training. REMA is advised to support to have and support focal point on environment in environment cross-cutting sectoral ministries to encourage not only facilitating environment mainstreaming but also a culture of monitoring and evaluating environment in those institutions.

xiii. Ensure linking project/programme information data to National, Sectoral and District decision making and objectives.
Annex 1: Issues discussed with stakeholders and M&E system design approach

Meeting and discussion with stakeholders dealing with environment done on the designing the M&E system taking account of the following:

i. Review their Strategic Planning Documents to assessment of the planning goals, objectives and targets;

ii. Review existing M&E system in the Environment and Natural resources sector and related cross-sectors and REMA. This assisted to come-up with a list of existing poverty-environment indicators in use, Monitoring and evaluation problems and constraints, lessons to the designing of M&E system of environment. Tables and matrixes have been be used be used to record poverty-environment indicators.

iii. To review information requirement by stakeholders to monitor and evaluate environment issues and indicator in the environmental areas. The purpose of the meeting was to agree on the information they require at each level of decision making. The latter assisted to avoid collecting unnecessary data and information which would not be used to design M&E system.

iv. Review existing data collection mechanisms and ongoing survey, questionnaire, data analysis and reporting system. The objective was to assess as to whether the existing data collection mechanisms are adequate to generate required poverty-environment indicators.

v. Review data analysis and reporting framework can generate information required at various administrative levels for decision making.

vi. A review of role of the sector working groups and the district coordination mechanism

vii. Review stakeholders role and involvement in monitoring and evaluation of environment

3. Designing Monitoring and Evaluation system taking account of the following:

i. Designing and providing information on poverty-environment indicators.

ii. A proposal of a set of Key leading and manageable poverty–environment indicators. The poverty-environment indicators were be presented to REMA and stakeholders, discussed and agreed upon as poverty-environment to be used for M&E of environment.

iii. Organizing Poverty-Environment indicators by Impact, outcome and output indicators

iv. Disaggregating poverty–environment indicators by administrative levels three levels, namely; the national, sectoral and district levels. Disaggregation has also been done by environmental themes.

v. The consultant also reviewed programme/project M&E systems to identify indicators. The consultant looked at four levels of indicators, namely: input, output, outcome, and impact indicators when establishing poverty-environment indicators.

vi. Reviewing and defining the mechanisms to collect data on indicators and analysis the data and proposing a reporting system. This exercise involved the following:

a. Defining data collection mechanisms, data analysis and the M&E Reporting System. The data collection & analysis framework for M&E system involved:

   d. Data and how data is collected and who collects it. A review of pilot questionnaire. Defining what data and how data is collected and who collects it.
A review of pilot questionnaire to collect data in Karongi district was done and recommendations made.

e. Defining data analysis framework; proposal for software for analysis, the equipment machinery, (severs for data storage, computers) and capacity to analysis data (at districts, and REMA). The consultant reviewed the pilot data collection and analysis going on in Karongi district to capture relevant poverty-environment indicators and facilitated analysis of pilot through providing poverty-environment indicators at national sectoral and district administrative levels to the districts and REMA and proposing types of required analysis.

f. Establishing levels of data analysis and consolidation and aggregation (district and national level (REMA) required.

g. Establishing the institutional role for data collection, analysis and aggregation will be established.

b. Develop a reporting system for the M&E system taking into account the existing reporting formats and information requirements of stakeholders in environment.

In this respect the consultant looked at the following:

- Establishing coordination framework of M&E information system
- Review capacity building requirement of M&E system
- Establishment information transfer, feedback and coordination needs. Where and how is information flow reaching the national, sectoral and districts. The flow of M&E information from point of source to point of use.
- A review of role of the sector working groups and stakeholders in environment in the M&E system
- Establish the stockholder’s involvement in the M&E system. Stakeholders will be identified and their roles established at different levels of administration

c. Training services

The training services involved the review and analysis of the following:

- Institutional and capacity building needs assessment for the M&E system
- Develop training modules of M&E tools/framework for sectors, REMA and district.
  The training modules related to planning and monitoring framework; major principles of monitoring and evaluation, data collection mechanisms and data analysis and reporting systems. The consultant will review existing training modules and make necessary adjustment on them to fit the training requirement on M&E system without compromising developing new training modules when necessary.
- Organize stockholder’s workshops to enhance awareness on poverty and environment indicators

d. Drafting M&E system and producing draft document for discussion

f. Finalization of M&E system and producing final document
## Annex 2: The linkage of environment to MDGs

<table>
<thead>
<tr>
<th>Millennium Development Goals</th>
<th>Examples of Links to the Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Eradicate extreme poverty and hunger</td>
<td>Livelihood strategies and food security of the poor often depend directly on healthy ecosystems and the diversity of goods and ecological services they provide.</td>
</tr>
<tr>
<td>2. Achieve universal primary education</td>
<td>Time spent collecting water and fuel wood by children, especially girls, can reduce time at school.</td>
</tr>
<tr>
<td>3. Promote gender equality and empower women</td>
<td>Poor women are especially exposed to indoor air pollution and the burden of collecting water and fuel wood, and have unequal access to land and other natural resources.</td>
</tr>
<tr>
<td>4. Reduce child mortality</td>
<td>Water-related diseases such as diarrhoea and cholera kill an estimated 3 million people a year in developing countries, the majority of which are children under the age of five.</td>
</tr>
<tr>
<td>5. Improve maternal health</td>
<td>Indoor air pollution and carrying heavy loads of water and fuel wood adversely affect women’s health and can make women less fit for childbirth and at greater risk of complications during pregnancy.</td>
</tr>
<tr>
<td>6. Combat major diseases</td>
<td>Up to one-fifth of the total burden of diseases in developing may be associated with environmental risk factors – and preventive environmental health measures are as important and at times more cost-effective that health treatments.</td>
</tr>
<tr>
<td>7. Ensure environmental sustainability</td>
<td>Current trends in environmental degradation must be reversed in order to sustain the health and productivity of the world’s ecosystem.</td>
</tr>
</tbody>
</table>

Source: Thematic belief: Mainstreaming the environment into poverty reduction strategies in SSA, Bamako workshop(21-25, *Joseph Opio-Odongo*)
## Annex 3: Targets and indicators of Millennium Development Goal 7

<table>
<thead>
<tr>
<th>Targets of Millennium Development Goal 7</th>
<th>Indicators Millennium Development Goal 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources.</td>
<td>• Proportion of land area covered by forests</td>
</tr>
<tr>
<td>Halve by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.</td>
<td>• Proportion of population with sustainable access to an improved water source</td>
</tr>
<tr>
<td>Have achieved, by 2020, a significant improvement in the lives of at least 100 million slum dwellers</td>
<td></td>
</tr>
</tbody>
</table>
### Annex 4: Linking, alignment and harmonising environment with EDPRS

<table>
<thead>
<tr>
<th>PRSP Context</th>
<th>Score</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Integrate environment as a cross-cutting theme, as a sector or both?</td>
<td>3</td>
<td>The environment is both a sector and cross-cutting issues. The EDPRS makes clear that as a sector, the environment has work jointly with other and or programmes and projects have to be subjected to Environment Impact Assessment criteria.</td>
</tr>
<tr>
<td>2. Consider environment as a strategic objective?</td>
<td>3</td>
<td>Environment is considered as strategic objective of EDPRS; the environment has been elevated to a sector while still recognising it as a cross-cutting sector. The EDPRS priorities on poverty reductions recognises modernizing agriculture by introducing improved land administration, land use management practices and adopting techniques to reduce soil erosion and enhance soil fertility and new job creation for youth outside agriculture. The latter will reduce stress on land.</td>
</tr>
<tr>
<td>3. Consider environment as an integral element of monitoring and evaluation?</td>
<td>3</td>
<td>The EDPRS considers environment as integral part of monitoring and evaluation. The EDPRS indicators has environment indicator in outcome and intermediate indicators. The environment also is supposed to be monitored and evaluated as a cross-cutting ensure by other sectors. The EDPRS M&amp;E framework takes requires sectors to monitor and evaluate all aspects of EDPRS Result and Policy Matrix which also includes elements of environment.</td>
</tr>
<tr>
<td>4. Consider environment as a theme which requires risk management?</td>
<td>1</td>
<td>This seems to have been implied in EDPRS. It is not coming out of explicitly in the context and in the Result Policy Matrix.</td>
</tr>
<tr>
<td>5. Evaluate environmental history and resultant situation of the country (cause and effect?)</td>
<td>2</td>
<td>EDPRS shows the cause and effect environment degradation and poverty. However, there is little, if any assessment of historical environment assessment in the EDPRS mainly because of paucity of data and those available were scattered in various studies and reports. Nevertheless, the EDPRS profited from lessons of evaluation of PRSP1, The study on economic analysis of natural resources study done in ---- and effect on environment on natural resources in Bugesera and Rugezi swamp. Study on poverty -environment indicators done (RWAPE(2006) and PEI(2007). However, the</td>
</tr>
</tbody>
</table>
results have not fully been taken up in the preparation of EDPRS.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Integrate poverty environment issues into national development frameworks?</td>
<td>3</td>
</tr>
<tr>
<td>Sub total</td>
<td>15</td>
</tr>
</tbody>
</table>

The poverty-environment issues have been integrated into development framework of Vision2020, the MDGs, EDPRS, Sector Strategic Plans and DDPs.

The total achievement is about 83% showing that Rwanda's EDPRS largely has considered environment in its context. The EDPRS did not consider environment in specific and clear terms as a theme which requires risk management. There is little, if any, assessment of historical environment assessment in the EDPRS mainly because of paucity of data and those available were scattered in various studies and reports.
2. Integrate poverty-environment Issues (from sectors and districts)

<table>
<thead>
<tr>
<th>Does the EDPRS</th>
<th>score</th>
<th>comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Integrate of land use and resultant environmental problems (degradation, deforestation, overgrazing, secure land tenure, Unplanned settlements in urban areas, desertification ,cultivation of marginal unproductive lands)</td>
<td>2</td>
<td>The environment land degradation, reforestation issues are reflected in the form of agriculture under erosion and forestry cover. The issue of secure land tenure and the solution of unplanned settlement are covered in EDPRS for the rural and urban areas. However, non-agricultural land under degradation is not covered. A review of environmental issues and problems of unproductive land on desertification, and cultivation of marginal unproductive lands are not also explicitly reflected in EDPRS.</td>
</tr>
</tbody>
</table>
| 2. Integrate a loss of Biodiversity (threats to ecosystems, threats to species and genes, nature-based opportunities (natural habitats))? | 3 | • It is planned to increase the proportion of protected areas for biodiversity preservation from 10% to 10% in 2012.  
• Rehabilitation of degraded wetlands and other protected areas to ensure the preservation of biological diversity are key environmental interventions in the EDPRS. The EDPRS RPM is representative indicator which is "land protected to maintain biological biodiversity " to measure the improved biodiversity. Nevertheless, the EDPR'S can consider other indicators such as "threatened animal species as % of total known animal species"; and other important indicators that are important to Rwanda but whose definition and methodology to is to be developed such as area of rehabilitated/total area of wetlands, % change of the area of wetlands |
<p>| 3. Integrate water use and resultant environmental problems (access to potable water, water use and sustainable management (drinking, irrigation, water bodies, etc), water quantity and quality and water pollution)? | 3 | Access to potable, water use and sustainable water management is well integrated in EDPRS. However issues of water quality and water pollution are not well elaborated and the indicator of water quality and pollution are not explicitly considered. |
| Integrate of air issues and resultant environmental problems (air quality, air pollution, solid fuel usage and ozone depletion and greenhouse gasses emissions, dust?) | 2 | EDPRS integrates issues for improvement of pollution management. Air quality will be improved through decrease the emission of greenhouse gases in the atmosphere (CO2,CH4,NO2,N2O). During EDPRS period, at least 50% of wood used as fuel by major users such as industries and community cooking replaced by peat. However, the problems and impact of air pollution are well reviewed and mitigation measures elaborated comprehensively. |</p>
<table>
<thead>
<tr>
<th>5. Respect Multilateral Environmental Agreements to which the country is a party (Ramsar, CBD, CMS, Climate Change etc)</th>
<th>3</th>
<th>The EDPRS respects Multi Environment Agreements by focusing on mitigating against degradation, rehabilitation of wetlands, biodiversity protection, supporting reforestation and management of RAMSAR sites. EDPRS argue for the implementation of the National Program for Adaptation on Climate Change (NAPA) and to develop a Clean Development Mechanism.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Integrate natural resource methods of extraction and sustainability limits (including inputs such as energy, forestry and other raw materials?)</td>
<td>2</td>
<td>Integration natural resource of extraction and sustainability limits are considered by the EDPRS. EDPRS shows that all projects and programmes will be subject to an Environmental Impact Assessment, improved land use management issues will be designed and executed to reduce degradation, soil erosion and soil fertility losses and to promote the rational use of mineral fertilizers and pesticides. The forestry sector is fully engaged with the environment and other sectors to limit further deforestation and promote reforestation. The Mining Sector is engaged with the Environment Sub-sectors in addressing potential environmental degradation from quarry activities, and with the private sector will increase value addition to mineral resources in an environmentally sustainable way. The foregoing notwithstanding, the EDPRS does not make explicit review and elaborate on extraction methods to show their impact on environmental make of mitigation measures. There is also no assessment of negative environment impact implied by the big push for energy with implied increases of electricity, growth of service sector, increase in waste. The later is not coming out clearly in EDPRS.</td>
</tr>
<tr>
<td>7. Evaluate the ecological cost and benefits of the natural resources being affected?</td>
<td>1</td>
<td>The EDPRS mentions the socio-economic and ecological importance of natural resources but does not evaluate the ecological cost and benefits of the natural resources being affected. There has been an economic study of natural resources which gives review of costs and benefits. Studies have been done on human impact on environment in Bugesera district and Rugezi wetland. There are number ecological studies done on agriculture by the Michigan University. However outputs of these studies are not fully comprehended in EDPRS and sectors.</td>
</tr>
<tr>
<td>Sub total</td>
<td>16</td>
<td>About 70% of environment is elaborated in EDPRS. The environment issues are largely integrated in EDPRS. However, there is need to integrate fully the following environment issues; degradation on non-agricultural land; Air issues and their environment implication on air pollution (not out explicitly in EDPRS); the implication of natural resources method of extraction and development undertakings in the area of energy, etc. The cost and benefits of natural resources needs to reviewed and to be well integrated in EDPRS.</td>
</tr>
</tbody>
</table>
### 3. Causal Links Assessment

<table>
<thead>
<tr>
<th>Does the EDPRS</th>
<th>Score</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Consider poverty profiles and resultant natural resource degradation (resource dependency and inequality?)</td>
<td>3</td>
<td>EDPRS makes a review poverty profile and shows part played by natural resources degradation to determine the poverty and of poverty profiled. The PRSP1 did assessment of poverty profile and results show great dependence on natural resources and that degradation environment is responsible of poverty by many rural agricultural communities.</td>
</tr>
<tr>
<td>2. Integrate and evaluate environmental vectors and resulting health issues (malaria, gastrointestinal illness etc) resulting from land, air, water or biomass degradation?</td>
<td>3</td>
<td>EDPR evaluates and integrates environmental resultant health issues such as malaria, gastrointestinal illness etc) resulting from land, air, water or biomass degradation.</td>
</tr>
<tr>
<td>3. Address environmental degradation and links to HIV/AIDS?</td>
<td>1</td>
<td>The EDPRS does not directly address environmental degradation links to HIV/AIDS. However the agricultural will carry out a study to assess the impact of AIDS on agriculture in order to design and implement interventions in key areas. In addition, the sector will examine how to integrate PLHIV in the sector and develop programs for PLHIV at the district level.</td>
</tr>
<tr>
<td>4. Consider vulnerability of the population to social, economic and health stress due to environmental degradation and events (floods, storms, infertile soil etc)</td>
<td>3</td>
<td>EDPRS elaborates vulnerability of the population to social, economic and health stress due to environment degradation and events. Rising population density in rural areas has placed the physical environment under increasing stress and the latter has inevitably highlighted land administration and land use management issues as central areas of concern for the ongoing land tenure and land use management reform process. Over 80% of diseases that afflict Rwandans are waterborne, so access to safe water is a precondition for improving environmental and personal health according to the Comprehensive Food Security and Vulnerability Analysis, 52% of households are food insecure or vulnerable (NISR and World Food Programme, 2006). Food insecurity is found all over the country but tends to be concentrated in the Western and Southern provinces. It is highest among agricultural labourers and those with ‘marginal</td>
</tr>
<tr>
<td>Question</td>
<td>Score</td>
<td>Response</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
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<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>livelihoods’ including those dependent on social transfers and female-headed households</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Address property rights and entitlements (land tenure, access, and control over management?)</td>
<td>2</td>
<td>EDPRS puts priorities on management include establishing land institutions, land registration mechanisms and land use planning, through a land use and management master plan. It advocates development of procedures to manage existing land folders and the land database that will facilitate the nationwide implementation of land tenure regularisation. Women’s rights to land and other property will be recognised and strengthened, regardless of their civil status, that is, whether they are single, married, divorced or widowed.</td>
</tr>
<tr>
<td>6. Analyze economic catalysts and their relationship to environmental quality <em>price stability, market access, taxation, subsidies, policies, exchange rates, trade etc?</em></td>
<td>0</td>
<td>EDPRS has not mentioned nor elaborated on the economic catalysts and their relationship to environmental quality nor using economic policies like taxation, subsidies and exchange rates to influence management environment.</td>
</tr>
<tr>
<td>7. Make foreign investment more pro-poor and pro-environment?</td>
<td>1</td>
<td>The EDPRS advocates all investments to be subjected on environment Impact Assessment. EDPRS says that investment in agriculture, manufacturing and service is essential to support a stronger and balanced pro-poor growth programme. The latter is not elaborated. It does not elaborate anywhere in the policies that the foreign investment have to be more pro poor and pro-environment.</td>
</tr>
<tr>
<td>8. Encourage sustainable consumption and production?</td>
<td>1</td>
<td>The EDPRS is weak in this area. However, in agriculture, the main programmes include the intensification of sustainable production systems in crop cultivation and animal husbandry will be encouraged.</td>
</tr>
<tr>
<td>9. Enhance development cooperation and debt relief?</td>
<td>1</td>
<td>While Enhance development cooperation and debt relief are a part of Macro-economic analysis, the EDPRS does not bring out in its context. However, External committed budgetary grants is a bout 772 million USD.</td>
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</tr>
<tr>
<td><strong>10. Consider devolution of land and environmental management to local and community authorities (partnerships, co-management, decentralization, conservancies, and empowerment?)</strong></td>
<td>0</td>
<td>The EDPRS does not consider the devolution of land and environmental management to local and communities. However, it is known that the issues of land legislation have been decentralised to districts and there are environment personnel at sectors dealing with environment issues.</td>
</tr>
<tr>
<td><strong>11. Consider anti-corruption efforts to protect the environment and the poor?</strong></td>
<td>1</td>
<td>While EDPRS does not link corruption with environment and does not link corruption measures with protection of the poor, however, it considers anti-corruption efforts to be important to realise development efforts. EDPRS advocates measures to be taken to reduce corruption by reinforcing the legal framework which supports anti-corruption monitoring mechanisms and supporting the activities of civil society organisations aimed at increasing transparency and accountability.</td>
</tr>
<tr>
<td><strong>12. Consider gender equality in environmental management?</strong></td>
<td>1</td>
<td>The EDPRS does not explicitly consider gender equality in environment management. It recognised the development of water sector that is responsive to women water needs but it does not show how women can participate in the management of water.</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td>17</td>
<td>The score on Causal Links Assessment of EDPRS with environment is 44.4 %. The average score is 1.3 compared to environment issues links to EDPRS which is about 2.3. This shows EDPRS has done great achievement in linking environment issues than assessment of causal links of poverty-environment. This is more attention poverty-environment links in terms of natural resources degradation and environmental health and less attention to aspects of property rights, empowerment, incentives, and gender. This analysis shows that the EDPRS did not adequately review and integrate the causal linkages of poverty-environment.</td>
</tr>
<tr>
<td>4. Response Systems (Investment, policy, legal and regulatory and management issues)</td>
<td>Does the EDPRS</td>
<td>score</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>1. Consider how the environment can be managed sustainable (regulation, legislation, policy, taxation, incentives, voluntary, environmental standards, co-management, institutional development?)</td>
<td>score</td>
<td>2</td>
</tr>
<tr>
<td>2. Evaluate how the country’s ecosystems have the capacity to buffer any serious natural disasters or environmental shocks?</td>
<td>score</td>
<td>1</td>
</tr>
<tr>
<td>3. Consider economic valuation of natural capital (including commercial and social use functions as well as ecological functions)?</td>
<td>score</td>
<td>1</td>
</tr>
</tbody>
</table>
for national food security as well as for energy supplies, owing to the decline in wetland water levels. Interruption of the role played by the Rugezi wetland as a hydro-electric power source has already led to electricity supply shortages in Rwanda. In this case, the cost of fuel required to run generators to provide replacement electricity to the national power grid is around US$65,000 per day. The EDPRS does elaborate explicitly the commercial, social and ecological functions of environment. The latter is important for advocacy on environment and to get people in the planning levels get to appreciate environment and to allocate adequate funding.

<p>| 4. Implement pro-poor environmental fiscal reform? | 1 | Environment fiscal reform is yet to be implemented. A study of fiscal reform done in 2009(August) but it is yet to be implemented. Nevertheless, the government has ensured that budget allocations are earmarked to support joint strategies for managing the environment and natural resources in all ministries to ensure that the EDPRS priorities contribute to sustainable national development. The implementation of fiscal reform is likely to increase funding for environment issues but also can avoid overlapping funding in environment related sectors. |
| 5. Encourage more private sector involvement in pro-poor environmental management? | 0 | The EDPRS does not show how the private sector will be involved in pro-poor environmental management |
| 6. Address how the environment can be monitored and evaluated regularly? | 3 | The EDPRS Result Policy Matrix and EDPRS M&amp;E framework all include poverty-environment to be monitored and evaluated by sectors, agencies and districts. |
| 7. Evaluate how investment in natural resources can be improved (land and water resources management and conservation, air quality, sustainable extractive industry management?) | 2 | EDPRS does evaluate how investment in natural resources can be improved and water resources management and conservation but not in air quality and sustainable extractive industry management. |
| 8. Expand access to environmentally sound and locally appropriate technology? | 0 | The EDPRS not mention the need to expand access to environmentally sound and locally appropriate technology. |</p>
<table>
<thead>
<tr>
<th>9. Evaluate investment for human needs (health, housing, infrastructure, energy, water, education etc)</th>
<th>3</th>
<th>The EDPRS does Evaluate investment for human needs in health, housing, infrastructure, energy, water, education, forestry and environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Evaluate human and institutional capacity needs for sustainable environmental management (availability of personnel, skills?)</td>
<td>1</td>
<td>EDPRS does not evaluate human and institutional capacity needs for sustainable environmental management (availability of personnel, skills) but highlights the need to strengthen capacity to implement all EDPRS programmes.</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>14</td>
<td>The EDPRS integrates the response systems (Investment, policy, legal and regulatory and management issues by 70%. The average is 1.4 less than a half of the highest score of 3 reflecting some response systems not well linked with and integrated in EDPRS. The EDPRS does not give policy on the issue of using taxation policies, exchange rates, incentives, subsidies to influence the private sector and people to adopt positive measures to protect environment or refrain from undertaking policies and measure negative to environment. It does not evaluate human and institutional capacity needs for sustainable environmental management (availability of personnel, skills); the EDPRS, does not elaborate explicitly on the commercial, social and ecological functions of environment. The latter is important for advocacy on environment and to get people in the planning levels get to appreciate environment and to allocate adequate funding; It does not evaluate investment in air quality and sustainable extractive industry management. The EDPRS integrates the response systems (Investment, policy, legal and regulatory and management issues by 70%. The average is 1.4 less than a half of the highest score of 3 reflecting some response systems not well linked with and integrated in EDPRS. The EDPRS does give policy on the issue of using taxation policies, exchange rates, incentives, subsidies to influence the private sector and people to adopt positive measures to protect environment or refrain from undertaking policies and measure negative to environment.; It does not evaluate investment in air quality and sustainable extractive industry management.).</td>
</tr>
<tr>
<td>EDPRS Development Process</td>
<td>score</td>
<td>comment</td>
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<td>---------------------------</td>
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<tr>
<td>Did the PRSP?</td>
<td></td>
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<tr>
<td>Have input from a range of environmental NGO’s, and local environmental ministries and institutions?</td>
<td>3</td>
<td>EDPRS has input from a range of environmental NGO’s, and local environmental ministries and institutions. The EDPRS has involved extensive consultation with a wide range of stakeholders at both central and local government levels. A national coordination structure (National Steering Committee (NSC)-made of ministers. The NSC was supported by a Technical Steering Committee (TSC), made up of Secretaries General, Executive Secretaries from Provinces, and representatives of donors, civil society and the Private Sector. The TSC played the principal coordinating role for the EDPRS, pulling together the work of the different Sector Working Groups and making high level recommendations to the National Steering Committee as appropriate. Nineteen sector working groups (SWGs) and Cross-Cutting Issues (CCIs) teams were involved, comprising stakeholders from central and local government, donors, civil society organisations and the private sector, and organised around four clusters (Growth, Rural Development, Human Development and Governance).</td>
</tr>
<tr>
<td>Allow sufficient time for proper consultation and redrafting?</td>
<td>3</td>
<td>Consultations were made over a period of 18 months and this was sufficient time for proper consultation and redrafting EDPRS. This sufficient time because the EDPRS was building on the bases of extensive consultation made on PRSP1 and lessons learnt from its evaluation.</td>
</tr>
<tr>
<td>Sub-total</td>
<td>6</td>
<td>The average consultation in EDPRS development process was 3 equal to highest score of 3. Therefore, there were 100% of the stakeholders.</td>
</tr>
</tbody>
</table>
## Annex 5: Data and Information requirements for environment stakeholders

(Government ministries, Districts, sectors, community (village) and civil societies and Sources)

<table>
<thead>
<tr>
<th>Level of Management</th>
<th>Information requirement</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Type of information</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>I. Government</td>
<td><strong>The performance of policies and strategies</strong> (MDGs, EDPRS, MTEF and Annual Budget, PERs, etc)</td>
</tr>
<tr>
<td>1.1 National level</td>
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<tr>
<td><strong>1.2 Sector Ministries</strong></td>
<td><strong>Agricultural production status and trends</strong></td>
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<tr>
<td>--------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>The Food Security status</td>
<td>* Cooperation performance</td>
</tr>
<tr>
<td>Reports on performance of environment conventions</td>
<td>Physical and financial information on government and donor supported programmes and projects</td>
</tr>
<tr>
<td>1.2 Sector Ministries</td>
<td>Sector planking and monitoring indicators</td>
</tr>
<tr>
<td>1.2 Sector Ministries</td>
<td></td>
</tr>
<tr>
<td>Programme/ project progress and performance</td>
<td>Physical and financial information on government and donor supported programmes and projects</td>
</tr>
<tr>
<td>Sector EDPRS performance reviews</td>
<td>Midterm and Final evaluation of programmes and projects</td>
</tr>
<tr>
<td>Sector performance audits</td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Source</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
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<tr>
<td>Agricultural production and food security</td>
<td>Evaluation of programs and projects</td>
</tr>
<tr>
<td>Study on the state of the environment in the country</td>
<td>Sector analysis and policy review;</td>
</tr>
<tr>
<td>The status of natural resource performance</td>
<td>Sector accountability</td>
</tr>
<tr>
<td>The status of infrastructure in the country</td>
<td>Natural resource audits and inventory</td>
</tr>
<tr>
<td>The disaster and disaster management information</td>
<td>Preparation of performance reports Prime Ministers Office and MINECOFIN</td>
</tr>
<tr>
<td>Disaster management</td>
<td>Disaster management</td>
</tr>
<tr>
<td>1.3 Agencies(Parastatical Authorities)</td>
<td>The implementation and performance of environment laws and regulations</td>
</tr>
<tr>
<td>The state of environment in the country</td>
<td>Preparation of State of environment</td>
</tr>
<tr>
<td>The status of natural resource performance</td>
<td>The implementation and performance of environment laws and regulations</td>
</tr>
<tr>
<td>The status of infrastructure in the country</td>
<td>Agency planning</td>
</tr>
<tr>
<td>Water and sanitation status</td>
<td>Follow-up poverty-environment</td>
</tr>
<tr>
<td>Indicator Performance</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Agency strategic planning and monitoring indicators</td>
<td>Preparation of performance reports to sector ministries</td>
</tr>
<tr>
<td>Sector performance reviews (joint sector reviews reports, PERs, MTEF and budget performance)</td>
<td>Budgeting and budget resource allocation</td>
</tr>
<tr>
<td>Programme/ project progress and performance</td>
<td>Follow-up implementation and management of environment activities</td>
</tr>
<tr>
<td>Sector annual performance on environment</td>
<td>Evaluation of programs and projects</td>
</tr>
<tr>
<td>Midterm and Final evaluation of programmes and projects</td>
<td>Midterm and Final evaluation of programmes and projects</td>
</tr>
<tr>
<td>Land use and management</td>
<td>Planning and programming</td>
</tr>
<tr>
<td>Forestry performance and management</td>
<td>Sub sector performance indicators on forestry, land use, wetlands, agricultural and livestock production</td>
</tr>
<tr>
<td>Wetland use and management</td>
<td></td>
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<tr>
<td>Land degradation</td>
<td></td>
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<tr>
<td>Soil and water</td>
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<tr>
<td>conservation</td>
<td>The disaster and disaster management information</td>
</tr>
<tr>
<td></td>
<td>Natural resources inventory</td>
</tr>
<tr>
<td>District</td>
<td>Agricultural and livestock production trends</td>
</tr>
<tr>
<td></td>
<td>District planning, monitoring and evaluation indicators</td>
</tr>
<tr>
<td></td>
<td>Incidence of flood damage in recent years</td>
</tr>
<tr>
<td></td>
<td>Incidence of fire damage in recent years</td>
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<tr>
<td></td>
<td>Percentage of agricultural land provided with irrigation</td>
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<tr>
<td></td>
<td>Percentage of agricultural land provided with flood protection</td>
</tr>
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<td></td>
<td>Natural resources inventory</td>
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<tr>
<td></td>
<td>Level and magnitude of participation in environment issues</td>
</tr>
<tr>
<td></td>
<td>District MTEF and budget performance</td>
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<tr>
<td></td>
<td>Programme/project progress and performance</td>
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<td></td>
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<tr>
<td>District EDPRS performance reviews</td>
<td>Reporting on capacity building activities</td>
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</tr>
<tr>
<td>IMIHIGO implementation progress and performance</td>
<td>Midterm and Final evaluation indicators for programmes and projects</td>
</tr>
<tr>
<td>Midterm and Final evaluation report at the end project life and impact evaluation after two/three years of project closure</td>
<td></td>
</tr>
<tr>
<td>Sanitation and hygiene status indicators</td>
<td>Baseline and performance reports for Sanitation and hygiene</td>
</tr>
<tr>
<td>Incidence of fire, flood damage in the past 5 years</td>
<td>Planning at sector and Akagali</td>
</tr>
<tr>
<td>Assessment of agricultural production and food security in the community</td>
<td>Disaster report on fire and floods</td>
</tr>
<tr>
<td>Assessment of poverty in the community</td>
<td>Poverty profile report</td>
</tr>
<tr>
<td>Assessment of disaster situation</td>
<td></td>
</tr>
<tr>
<td>Reporting on health, sanitation and hygiene conditions</td>
<td>Agricultural and livestock production status report</td>
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<tr>
<td>Reporting on land conflicts</td>
<td></td>
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<tr>
<td>Reporting on capacity building activities</td>
<td></td>
</tr>
<tr>
<td>Agricultural yield of crop or livestock per hectare</td>
<td></td>
</tr>
<tr>
<td>Household health conditions</td>
<td>local community empowerment and</td>
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<td></td>
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<tr>
<td>Civil societies (NGOs)</td>
<td>Level and magnitude of participation in environment issues</td>
</tr>
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<td>-----------------------</td>
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<tr>
<td></td>
<td>Sectoral strategic planning priorities, sector plan monitoring and evaluation indicators</td>
</tr>
<tr>
<td>District planning priorities, district plan, monitoring and evaluation indicators</td>
<td>Policy debates</td>
</tr>
<tr>
<td>Community priorities in district and sector plans</td>
<td>Resource allocation to priority government and communities</td>
</tr>
<tr>
<td>Progress and performance indicators for sub sectors (forestry, agriculture and livestock, environment, land use)</td>
<td>Planning and appraisal of projects</td>
</tr>
<tr>
<td>Stakeholder capacity, weakness and strength</td>
<td>Stakeholder analysis</td>
</tr>
</tbody>
</table>
### Annex 6: Matrix 1: Existing Poverty-Environment Indicators organised by Impact, Outcome and Output Indicators

#### Type of Indicator: Impact Indicators

<table>
<thead>
<tr>
<th>Name of indicator</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. GDP growth rate</td>
<td></td>
</tr>
<tr>
<td>2. Share of population living below poverty line (%)</td>
<td></td>
</tr>
<tr>
<td>3. Economic inequality (Gini coefficient of consumption)</td>
<td></td>
</tr>
<tr>
<td>4. Share of population living in extreme poverty (%)</td>
<td></td>
</tr>
<tr>
<td>5. Poverty incidence among people living in female-headed households (%)? (not in EDPRS)</td>
<td></td>
</tr>
<tr>
<td>6. Per capita real income among rural households</td>
<td></td>
</tr>
<tr>
<td>7. % fall in the share of rural pop. below national poverty line</td>
<td></td>
</tr>
<tr>
<td>8. % fall of population with less than min. food requirements.</td>
<td></td>
</tr>
<tr>
<td>9. % contribution of natural resource exploitation to national economy</td>
<td></td>
</tr>
<tr>
<td>10. Annual fuel wood consumption as a proportion of total standing volume</td>
<td></td>
</tr>
<tr>
<td>11. Prevalence of diarrhoea</td>
<td></td>
</tr>
<tr>
<td>12. Annual death rate from malaria among under-fives &amp; pregnant women</td>
<td></td>
</tr>
<tr>
<td>13. % of total population who are food insecure</td>
<td></td>
</tr>
<tr>
<td>14. % increase in per capita income among rural households</td>
<td></td>
</tr>
<tr>
<td>15. Incidences of deaths, illnesses or loss/destruction of property due to floods, landslides or drought</td>
<td></td>
</tr>
<tr>
<td>16. % of people with access to safe water</td>
<td></td>
</tr>
<tr>
<td>17. Incidences of malnutrition among under-five year olds</td>
<td></td>
</tr>
<tr>
<td>18. Infant mortality rate</td>
<td></td>
</tr>
<tr>
<td>19. Under 5 mortality rate</td>
<td></td>
</tr>
<tr>
<td>20. % of forestry cover in the country</td>
<td></td>
</tr>
<tr>
<td>21. Soil loss (in t/ha/year)</td>
<td></td>
</tr>
<tr>
<td>22. Area protected against soil erosion</td>
<td></td>
</tr>
<tr>
<td>23. Water availability</td>
<td></td>
</tr>
</tbody>
</table>

#### Type of Indicator: Outcome Indicators

<table>
<thead>
<tr>
<th>Name of indicator</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. % GDP growth for all crops, livestock products</td>
<td></td>
</tr>
<tr>
<td>2. Incidences of water-borne diseases among under-five year olds</td>
<td></td>
</tr>
<tr>
<td>3. Incidences of malaria among women and young children</td>
<td></td>
</tr>
<tr>
<td>4. Area of land protected to maintain biological diversity</td>
<td></td>
</tr>
<tr>
<td>5. Percentage of the poor living on marginal land such as fragile highland areas</td>
<td></td>
</tr>
<tr>
<td>6. % of rural households with secure land tenure</td>
<td></td>
</tr>
<tr>
<td>7. Proportion of population with environmental illnesses</td>
<td></td>
</tr>
<tr>
<td>8. Decrease the emission of greenhouse gases in the atmosphere (CO2, CH4, NO2)</td>
<td></td>
</tr>
<tr>
<td>9. Rwanda land use per household per hectare</td>
<td></td>
</tr>
<tr>
<td>10. % of households &amp; industries using fuel wood as a source of energy for cooking</td>
<td></td>
</tr>
<tr>
<td>11. Energy use per unit of GDP</td>
<td></td>
</tr>
<tr>
<td>12. Proportion of total land area under forest &amp; tree cover employing the poor?</td>
<td></td>
</tr>
<tr>
<td>13. % decrease in the consumption of firewood through the use of improved cook stoves</td>
<td></td>
</tr>
<tr>
<td>14. Percentage of households using more efficient wood-based technologies for energy</td>
<td></td>
</tr>
<tr>
<td>15. % of irrigation &amp; other water-intensive projects that have been subjected to environmental</td>
<td></td>
</tr>
</tbody>
</table>

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70
<table>
<thead>
<tr>
<th>Impact Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. % of household accessible to alternative energy supplies (Methane, biogas, peat, solar, electricity)</td>
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<td>18. Proportion of critical wetlands under intensive agricultural use</td>
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<td>19. % of existing land rights secured through land tenure regularization for effective land administration and land use management</td>
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<tr>
<td>21. % of non-agricultural land protected against soil erosion (New indicator added by consultant)</td>
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<tr>
<td>22. Proportion of arable land that is protected from erosion</td>
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<tr>
<td>23. Average time spent by women &amp; children collecting water</td>
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<tr>
<td>24. % of water resources complying with quality standards</td>
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<tr>
<td>25. % of urban and rural population accessing sanitation services</td>
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<tr>
<td>26. % of industries &amp; commercial entities using cleaner production mechanisms</td>
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<tr>
<td>27. Quantity of water used per capita per day</td>
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<td>28. Per capita water use among poor households</td>
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<tr>
<td>29. Proportion of household income spent on water</td>
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<tr>
<td>30. % of rural water supply systems functional at the time of spot checks in rural and urban areas</td>
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<tr>
<td>31. % of population using hygienic and sanitation facilities</td>
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<tr>
<td>32. Proportion of population with sustainable access to adequate sanitation</td>
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<tr>
<td>33. % of households with access to adequate sanitation facilities</td>
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<tr>
<td>34. % of households with sustainable use of water for production</td>
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<tr>
<td>35. % of under-fives who are underweight</td>
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<tr>
<td>36. % of rural children under 5 years who are stunted</td>
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<tr>
<td>37. % of household income from agriculture &amp; livestock</td>
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<tr>
<td>38. % of industries &amp; other commercial entities with waste water treatment facilities</td>
</tr>
<tr>
<td>39. % of total population who are susceptible or exposed to the risk of floods, landslides or drought</td>
</tr>
<tr>
<td>40. % of the public/private programmes providing biodegradable alternatives to banned items</td>
</tr>
<tr>
<td>41. Quantity of annual household consumption that is derived from forest products</td>
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**Type of Indicator: Output Indicators/Input**

<table>
<thead>
<tr>
<th>Type of Indicator</th>
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<tbody>
<tr>
<td>1. Per capital crop production</td>
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<tr>
<td>2. % of provided water as a proportion of average water consumption requirements for crop production</td>
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<td>3. % of provided water as a proportion of average water consumption requirements for livestock production</td>
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<tr>
<td>4. Proportion of tree nurseries stocked with threatened tree species per district</td>
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<td>5. % of threatened species to total native species</td>
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<td>6. % of protected areas with biodiversity preservation</td>
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<td>7. Incidence of water stress</td>
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<td>8. Access to improved sanitation facilities in urban areas</td>
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<td>9. Access to improved sanitation facilities in rural areas</td>
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<td>10. Slum areas with improved drainage</td>
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<td>11. No. of trainings in community based natural resources management</td>
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<td>12. % of degraded wetlands rehabilitated</td>
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<td>13. Ha of critical water catchments identified &amp; protected</td>
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<tr>
<td>14. No. of Water User Committees (WUCs) formed</td>
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<td>15. % of WUCs with O&amp;M budget</td>
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## Annex 7: Selected Poverty-Environment Indicators

<table>
<thead>
<tr>
<th>Type of Indicator: Impact Indicators</th>
<th>What the indicator is measuring</th>
<th>Source of Available data</th>
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<tbody>
<tr>
<td>Name of indicator</td>
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<tr>
<td>1. GDP growth rate of wealth of</td>
<td>This indicator measures the growth rate of the wealth of Rwanda in terms of Gross Domestic Product (GDP)</td>
<td>Macroeconomic framework at MINECOFIN, EDPRS, and Census documents, DHS, EICV.</td>
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<tr>
<td>Rwanda</td>
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<tr>
<td>2. Share of population living below</td>
<td>The indicator measures the percentage of population living below the poverty line of 2500 calories per day (dietary energy consumption) or below USD 250Rwf per day.</td>
<td>EDPRS, EICV</td>
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<tr>
<td>poverty line (%)</td>
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<tr>
<td>3. Economic inequality (Gini</td>
<td>This index measures the degree of inequality in the distribution of family income in a country.</td>
<td>EDPRS, DHS, USAID Country Health Statistical Report Rwanda May 2007</td>
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<tr>
<td>coefficient of consumption)</td>
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<tr>
<td>4. Share of population living in</td>
<td>The indicator measures the proportion of population whose income or consumption is below the poverty line, that is, the share of the households that cannot afford to buy a basic basket of goods worth 2500 calories per day or below USD 250Rwf per day in Rwanda. In 2006 the extreme poverty extreme poverty line (covers food costs only) was RWF 175 per day.</td>
<td>EICV, EDPRS, DHS</td>
</tr>
<tr>
<td>extreme poverty (%)</td>
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<tr>
<td>5. Poverty incidence among people</td>
<td>This is measures the likelihood of poverty among women headed households.</td>
<td>EICV, DHS, MD</td>
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<tr>
<td>living in female-headed households</td>
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<td>(%) (not in EDPRS)</td>
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<tr>
<td>6. Per capita real income among</td>
<td>The indicator measures the per capita real income among rural households. This is income from agriculture and other source like off-farm employment divided by inflation rate divided by rural population. It is real per capita income per household in rural areas.</td>
<td>EDPRS, DHS, EICV, Census, annual agricultural reports and MINECOFIN economic reports</td>
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<tr>
<td>rural households</td>
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</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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</tr>
<tr>
<td>7. % Increase in the share of rural pop. below national poverty line</td>
<td>The indicator measures the proportion of rural populations of the national population living below the poverty line of 2500 calories per day or below USD 250Rwf per day. It reflects improvement in poverty reduction.</td>
<td>EDPRS, EICV, EDPRS, Annual agricultural reports, Comprehensive Food Security and Vulnerability Analysis(CFSVA)</td>
</tr>
<tr>
<td>8. % Increase fall of population with less than min. food requirements.</td>
<td>The indicator measures the decrease of the proportion of population with less than min. food requirements. The indicator reflects improved food situation.</td>
<td>EICV, EDPRS, Annual agricultural reports, Comprehensive Food Security and Vulnerability Analysis (CFSVA(NSIR)</td>
</tr>
<tr>
<td>9. % contribution of natural resource exploitation to national economy</td>
<td>The indicator measures the proportion of natural resource exploitation contributed to the national economy. It reflects the value of natural resources and measures the% contribution of natural resources to the GDP.</td>
<td>EICV, MINIRENA reports, Studies</td>
</tr>
<tr>
<td>10. Annual fuel wood consumption as a proportion of total standing volume</td>
<td>The indicator measures the mount of national firewood consumed by households, private and public enterprises and institutions per year.</td>
<td>MINERENA, NAFA, EICV</td>
</tr>
<tr>
<td>11. Prevalence of diarrhoea</td>
<td>The indicator measures the percent of surviving children under five years old who had diarrhoea in the two weeks preceding the survey, based on mothers’ reports concerning the presence of loose stools.</td>
<td>DHS, EICV</td>
</tr>
<tr>
<td>12. Annual death rate from malaria among under-fives &amp; pregnant women</td>
<td>The indicator measures annual death rate from malaria among less than five children and pregnant women.</td>
<td>DHS, EICV, Malaria based surveys by MOH</td>
</tr>
<tr>
<td>13. % of total population who are food insecure</td>
<td>This indicator measures the % of population (both rural and urban) who are unable to get minimum level of energy requirement of 2500 calories per day</td>
<td>EICV, MINIRENA reports, Food security vulnerability studies.</td>
</tr>
<tr>
<td>14. % increase in per capita income among rural households</td>
<td>The indicators measures % increase of income of rural household from agriculture, livestock rearing, cultivation of crops, household level processing of products, valuation of consumption of own production and the wage income from agricultural labour by individuals working for a different household divided by the number of rural households.</td>
<td>EICV, DHS, population based surveys, Agricultural surveys, food security surveys</td>
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<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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<tr>
<td>15. Incidences of deaths, illnesses or loss/destruction of property due to floods, landslides or drought</td>
<td>The indicator measures the No. of human deaths or injuries and property loss due to floods, landslides and drought</td>
<td>MINERENA, REMA, MINAGRI, Districts</td>
</tr>
<tr>
<td>16 Incidences of malnutrition among under-five year olds</td>
<td>The indicator measures the likelihood of the existence of malnutrition among under-five year olds</td>
<td>DHS, EICV</td>
</tr>
<tr>
<td>17. Infant mortality rate</td>
<td>Annual number of deaths that occur in children under five(0-4 years old) per 1,000 births</td>
<td>DHS, EICV</td>
</tr>
<tr>
<td>18. Under 5 mortality rate</td>
<td>The indicator is estimates annual number of deaths of infants under 12 months in a given year per 1,000 live births in that same year</td>
<td>DHS, EICV</td>
</tr>
<tr>
<td>19. Soil loss( in t/ha/year)</td>
<td>This indicator provides an estimate of soil lost as a result of erosion.</td>
<td>MINAGRI, MINIRENA reports, The land Centre, districts.</td>
</tr>
<tr>
<td>20 Water availability</td>
<td>This indicator reflects the balance of surface water resources in a designated water management area or at country level comparing water resource availability with water demand.. The indicator shows the degree of water resources allocation in an area. If the percentage demand is close to 100% of available resources, the local water resources potential to supply water is nearly exhausted indicating a water deficit in that Water management area.</td>
<td>MININFRA, MINIRENA, MINAGRI</td>
</tr>
<tr>
<td>1. % GDP growth for all crops, livestock products</td>
<td>This indicator measures the contribution of agriculture to GDP growth rate</td>
<td>Agricultural census, EICV, Agricultural annual reports</td>
</tr>
<tr>
<td>2. Per capital crop production</td>
<td>This measures crop production per rural population per year</td>
<td>Agricultural census, EICV, Agricultural annual reports</td>
</tr>
<tr>
<td>3. Incidences of water-borne diseases among under-five year olds</td>
<td>The indicator measures the prevalence of diarrhoea among less than 5 years old.</td>
<td>DHS, EICV</td>
</tr>
<tr>
<td>4. Incidences of malaria among women and young children</td>
<td>The indicator measures the % likelihood of malaria among women and young children</td>
<td>DHS, EICV, Population based surveys</td>
</tr>
<tr>
<td>5. Area of land protected to maintain biological diversity</td>
<td>This is the area of land protected to maintain the biological diversity.</td>
<td>MDG, MINIRENA, REMA, ORTPN</td>
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<tr>
<td>6. Area of land protected to maintain biological diversity</td>
<td>This indicator measures the proportion of protected area that has biodiversity preservation.</td>
<td>MINIRENA, REMA, ORTPN</td>
</tr>
<tr>
<td>7. Percentage of the poor living on marginal land such as fragile highland areas</td>
<td>The indicator measures the proportion of poor households settled and living on poor marginal lands. The indicators reflect increase or decrease of land degradation in the marginal area in relation to poor people living in marginal areas.</td>
<td>EICV, DHS, Agricultural survey</td>
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<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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<tr>
<td>8. % of rural households with secure land tenure</td>
<td>The indicator measures the % of rural households who have land titles and can use the as collateral for investment loans</td>
<td>EICV, DHS, MINIRENA, NLC</td>
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<tr>
<td>9. Decrease the emission of greenhouse gases in the atmosphere (CO2,CH4,NO2)</td>
<td>There are three main greenhouse gases, these being: carbon dioxide, nitrous oxide and methane. The total emissions of these three gases per identified sector (energy, industrial processes, agriculture and waste) are used as a measure of greenhouse gas emissions in Rwanda</td>
<td>Rwanda UNFCC report,</td>
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<tr>
<td>10. Rwanda land use per household per hectare</td>
<td>The indicator seeks to measure the amount of land available per household per hectare</td>
<td>RWANDA Agricultural Survey 2006, EICV, SOE</td>
</tr>
<tr>
<td>11. % of households &amp; industries using fuel wood as a source of energy for cooking</td>
<td>This measures the proportion of households and industries using fuel wood as a source of energy for cooking</td>
<td>EICV, MINIRENA, Districts</td>
</tr>
<tr>
<td>12. Energy use per unit of GDP</td>
<td>This indicator shows the amount of energy used per unit of GDP. The indicator is a proxy indicator of incidence of poverty- the lower the indicator the high the % of poor households that can not afford adequate amount of energy, particularly electricity to use for different services.</td>
<td>MINIFRA, EICV</td>
</tr>
<tr>
<td>13. Proportion of total land area under forest &amp; tree cover employing the poor</td>
<td>The indicator measures the land area under forest and tree cover either held or employing the poor.</td>
<td>MINIRENA reports, NAFA reports, District reports</td>
</tr>
<tr>
<td>14. % decrease in the consumption of firewood through the use of improved cook stoves</td>
<td>The indicator reflects the impact of use of improved cook stoves on the conservation of forestry. It measures the decrease of consumption of firewood by households who adopted the improved cooking stoves</td>
<td>EICV, NSIR</td>
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<tr>
<td>15. Percentage of households using more efficient wood-based technologies for energy</td>
<td>This measures the proportion of households adapting and using wood-based technologies for energy</td>
<td>EICV, DHS</td>
</tr>
<tr>
<td>16. % of irrigation &amp; other water-intensive projects that have been subjected to environmental impact assessment</td>
<td>The indicator measures the proportion of the irrigation and water projects which have been subjected to environment impact assessment test.</td>
<td>MINAGRI, MININFRA, REMA</td>
</tr>
<tr>
<td>17. % of household accessible to alternative energy supplies (Methane, biogas, peat, solar, electricity)</td>
<td>This indicator measures the proportion of household using alternative energy supplies (Methane, biogas, peat, solar, electricity) for cooking and lighting.</td>
<td>EICV, DHS, MINIFRA</td>
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<tr>
<td>Name of indicator</td>
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<td>Source of Available data</td>
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<tr>
<td>18. % of existing land rights secured through land tenure regularization for effective land administration and land use management</td>
<td>This measures the proportion of land rights provided to households, private and public entities.</td>
<td>MINIRENA, NLC, District reports</td>
</tr>
<tr>
<td>19. Area protected against soil erosion</td>
<td>This indicator measures the area in Rwanda for arable land and non-arable land that is protected from soil erosion through soil conservation and protection from anti-erosion regulations and bylaws.</td>
<td>MINAGRI, REMA, Districts</td>
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<tr>
<td>20. % of agricultural land protected against soil erosion</td>
<td>The indicator measures the agricultural land that is protected from soil erosion through soil conservation and protection from anti-erosion regulations and bylaws.</td>
<td>MINAGRI, REMA, Districts</td>
</tr>
<tr>
<td>21. % of non-agricultural land protected against soil erosion</td>
<td>The indicator measures the non-agricultural land that is protected from soil erosion through soil conservation and protection from anti-erosion regulations and bylaws.</td>
<td>MINIRENA, NLC, Districts</td>
</tr>
<tr>
<td>22. Proportion of arable land that is protected from erosion</td>
<td>The indicator measures the area of agricultural land (both arable and non-arable) in the districts that is protected by soil conservation and anti-erosion regulations &amp; byelaws.</td>
<td>MINIRENA, NLC, Districts</td>
</tr>
<tr>
<td>23. % of people with access to safe water</td>
<td>The indicator measures the proportion of people who can access to an improved water source. The indicator refers to water accessibility to rural and population from an improved source, such as a household connection, public stand pipe, borehole, protected well or spring, or rainwater collection. Unimproved sources include vendors, tanker trucks, and unprotected wells and springs</td>
<td>MINIRENA and REMA</td>
</tr>
<tr>
<td>24. % of population with access to safe(clean) drinking water (within 500 meters in rural areas and 200 meters in urban areas)</td>
<td>The indicator measures the proportion of population who use any of the following types of water supply for drinking: piped water, public tap, bore hole/pump, protected well, and protected spring, rain water within accepted distance of 500 meters for rural areas and 200 meters for urban areas. It measures the distance walked by each household member to collect water per day X no. of members X by number of days per year.</td>
<td>MINIRENA, EICV, Districts</td>
</tr>
<tr>
<td>25. Average time spent by women &amp; children collecting water</td>
<td>The indicator measures the time spent by women &amp; children in rural and urban areas collecting water.</td>
<td>EICV, DHS</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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<tr>
<td>26. % of water resources complying with quality standards</td>
<td>This indicator measures the proportion of water source such as piped water, improved springs, etc, that provide drinking water for households, public and private entities that receive water treatment according to international standards required for regarding it as save and clean water. WHO provides water quality standards and those standards are meant to promote safe and acceptable standards of water quality that countries can feasibly achieve via appropriate treatment and distribution systems. The primary aim of the standards is to protect public health from the effects of contaminated drinking water.</td>
<td>EICV, DHS, MININFRA, MINIRENA</td>
</tr>
<tr>
<td>27. % of urban and rural population accessing sanitation services</td>
<td>The indicator measures the proportion of the urban and rural population with access to at least adequate excreta disposal facilities (private or shared, but not public) that can effectively prevent human, animal, and insect contact with excreta.</td>
<td>MINIRENA and REMA</td>
</tr>
<tr>
<td>28. % of industries &amp; commercial entities using cleaner production mechanisms</td>
<td>This indicator measures the proportion of industries &amp; commercial entities using cleaner production mechanisms. The indicator reflects the extent to which the cleaner production mechanisms have been adapted and already being used by industries &amp; commercial entities.</td>
<td>MINIRENA and REMA</td>
</tr>
<tr>
<td>29. Quantity of water used per capita per day</td>
<td>Volume of water collected by or delivered to the household and used there for drinking, cooking, bathing, personal and household hygiene and sanitation divided by number of persons in sample households</td>
<td>EICV, DHS, MINIRENA, MININFRA, UNICEF</td>
</tr>
<tr>
<td>30. % of poor urban households within 200 metres of solid waste skip</td>
<td>This indicator measures the proportion of poor urban households with solid waste disposal facility (waste skip) within 200 meters from their dwelling house.</td>
<td>EICV, MINRENA, PVK and Town councils</td>
</tr>
<tr>
<td>31. % of poor Households within 30 min of functional safe water source</td>
<td>The indicator refers to the percentage of poor households with reasonable access to an adequate amount of water( at least 10 litres in rural and 20 litres in urban areas per day) from an improved source within time of 30 minutes</td>
<td>MINIRENA, Districts</td>
</tr>
<tr>
<td>32. Per capita water use among poor households</td>
<td>Volume of water collected by or delivered to the household and used there for drinking, cooking, bathing, personal and household hygiene and sanitation divided by number of persons in sample households</td>
<td>EICV, DHS, MINIRENA, MININFRA, Districts</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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</tr>
<tr>
<td>33. Proportion of household income spent on water</td>
<td>The indicator measures the proportion of household income spent on purchasing water for drinking, cooking, bathing, personal and household hygiene and sanitation.</td>
<td>EICV, DHS</td>
</tr>
<tr>
<td>34. % of population using hygienic and sanitation facilities</td>
<td>The indicator measures the proportion of population using hygienic and sanitation facilities. The indicator seeks to reflect the hygiene conditions of the households in terms of safe water storage, safe hand washing practices, safe treatment of food stuffs and sanitation conditions of households and institutions (public and private) in terms of safe collection, storage, treatment and disposal of human excreta (faeces and urine), management/re-use/recycling of solid waste (rubbish), collection and management of industrial waste products, management of hazardous wastes (including hospital wastes, chemical/radio-active and other dangerous substances).</td>
<td>EICV, DHS, MINIRENA, Districts</td>
</tr>
<tr>
<td>35. % of households with access to adequate sanitation facilities</td>
<td>Proportion of households who have within their dwelling or compound: toilet connected to sewage system, any other flush toilet (private or public); improved pit latrine; traditional pit latrine</td>
<td>EICV, DHS, MINIRENA, Districts</td>
</tr>
<tr>
<td>36. % of households with sustainable use of water for production</td>
<td>This indicator measures the proportions of households with adequate and sustainable source of water for production (both crop and livestock) such as from perennial water swamps with drainage system, rainwater harvesting/ water conservation technologies/facilities like water tanks/dams. The indicators seek to show the contribution of existing or non-existence of households with sustainable use water to food security or insecurity.</td>
<td>MINAGRI, MINIRENA, Districts, EICV</td>
</tr>
<tr>
<td>37. % of under-fives who are underweight</td>
<td>The indicator measures the percent of children under 5 whose weight measurement is more than 2 standard deviations below the median reference</td>
<td>DHS, EICV</td>
</tr>
<tr>
<td>38. % of rural children under 5 years who are stunted</td>
<td>The indicator measures the percent of children under 5 whose height measurement is more than 2 standard deviations below the median reference</td>
<td>DHS, EICV</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
</tr>
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</tr>
<tr>
<td>39. % of household income from agriculture &amp; livestock</td>
<td>The indicator measures the magnitude or proportion of household’s income from agriculture and livestock compared to total income from all sources of household income. The indicator seeks to show the significance of agriculture and livestock as a source of income. When the income is disaggregated by income quintile per annum, the indicator is able to reflect the income going to the very poor, poor, the rich and very rich.</td>
<td>DHS, EICV, MINAGRI. Population based survey</td>
</tr>
<tr>
<td>40. % of industries &amp; other commercial entities with waste water treatment facilities</td>
<td>The indicators measures the proportion of industries and commercial entities with drainage and disposal/ reuse/ recycling of waste water (also referred to as ‘grey water’) and drainage of storm water, treatment and disposal/ reuse/ recycling of sewage .</td>
<td>MINIRENA, REMA, RDB</td>
</tr>
<tr>
<td>41. % of total population who are susceptible or exposed to the risk of floods, landslides or drought</td>
<td>The indicator measures the proportion of population living in areas like mountain and hill slopes, lowland areas, dry areas that are prone to floods, landslides and drought</td>
<td>MINIRENA, REMA, Districts</td>
</tr>
<tr>
<td>42. % of the public/private programmes providing biodegradable alternatives to banned items</td>
<td>This indicator measures the proportion of public and private programmes that have and can provide biodegradable alternatives to banned items.</td>
<td>REMA, MINERENA, Districts</td>
</tr>
<tr>
<td>43. Quantity of annual household consumption that is derived from forest products</td>
<td>The indicator measures the quantity of forest produce/ products consumed by households per year.</td>
<td>MINIRENA, NAFA, REMA</td>
</tr>
<tr>
<td>1. % of provided water as a proportion of average water consumption requirements for crop production</td>
<td>This indicator measures the proportion (amount) of water available for crop production as a proportion of average water consumption requirement for crop production. The indicator reflects water availability stress for crop production and effects on food security.</td>
<td>MINAGRI, District</td>
</tr>
<tr>
<td>2. % of provided water as a proportion of average water consumption requirements for livestock production</td>
<td>This indicator measures the proportion (amount) of water available for livestock as a proportion of average water consumption requirement for livestock. The indicator reflects water availability stress for livestock and effects on food security.</td>
<td>MINAGRI, District</td>
</tr>
<tr>
<td>3. Proportion of tree nurseries stocked with threatened tree species per district</td>
<td>This indicator measures the proportion of tree nurseries stocked with threatened tree species per district. The indicator reflects on the capacity of districts to regenerate the threatened tree species.</td>
<td>MINIRENA, Districts</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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<tr>
<td>4. % of threaten species to total native species</td>
<td>This indicator measures the proportion of threatened species to total native species It seeks to show the extent of protection or the Conservation of biological diversity through showing the proportion of threatened species to total species</td>
<td>MINIRENA, REMA</td>
</tr>
<tr>
<td>5. % of farmers who have planted medicinal plant species</td>
<td>The indicator measures the proportion of farmers who are planting medicinal plant species to prevent their extinction. The indicator refers to the sustainability of medicinal plants species.</td>
<td>MINIRENA, NAFA, Districts</td>
</tr>
<tr>
<td>6. % of area of the land protected to maintain biodiversity</td>
<td>The indicator measures the Ratio of Area Protected to Maintain Biological Diversity to Surface Area (expressed in % terms). The indicator shows the commitment of the government of Rwanda to safeguard and protect the biodiversity.</td>
<td>MINIRENA, REMA, Districts.</td>
</tr>
<tr>
<td>7. Proportion of wetlands conserved/ sustainably used</td>
<td>The indicator measures the wetlands which have been conserved are protected by anti-erosion regulations and laws to allow the wetland used sustainably.</td>
<td>MINIRENA, REMA, Districts</td>
</tr>
<tr>
<td>8. % of protected areas with biodiversity preservation</td>
<td>This indicator measures the proportion of protected area that has biodiversity preservation.</td>
<td>MINIRENA, REMA, ORTPN</td>
</tr>
<tr>
<td>9. Incidence of water stress</td>
<td>This measures the degree of scarcity or availability of water</td>
<td>MININFRA, MINIRENA</td>
</tr>
<tr>
<td>10. Access to improved sanitation facilities in urban areas</td>
<td>The indicator measures an access to improved sanitation facilities in urban areas. It refers to the percentage of the urban population with access to at least adequate excreta disposal facilities (private or shared, but not public) that can effectively prevent human, animal, and insect contact with excreta</td>
<td>EICV, DHS, Districts</td>
</tr>
<tr>
<td>11. Access to improved sanitation facilities in rural areas</td>
<td>Access to improved sanitation facilities in rural areas. Refers to the percentage of the rural population with access to at least adequate excreta disposal facilities (private or shared, but not public) that can effectively prevent human, animal, and insect contact with excreta.</td>
<td>EICV, DHS, Districts</td>
</tr>
<tr>
<td>12. Slum areas with improved drainage</td>
<td>This indicator measures the proportion of household in slum areas with improved drainage system for draining or disposal / reuse of rain water and waste water</td>
<td>EICV, PVK and Town councils</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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</tr>
<tr>
<td>13. No. of trainings in community based natural resources management</td>
<td>The indicator measures No. of trainings in community based natural resources management. The indicator reflects on the capacity building for communities in natural resource management.</td>
<td>REMA, District</td>
</tr>
<tr>
<td>14. % of degraded wetlands rehabilitated</td>
<td>The indicator measure the proportion of rehabilitated degraded wetlands</td>
<td>MINIRENA, REMA, District</td>
</tr>
<tr>
<td>15. Ha of critical water catchments identified &amp; protected</td>
<td>The indicator measures the area of critical water catchments identified and protected against soil erosion</td>
<td>MINIRENA, REMA and Districts</td>
</tr>
<tr>
<td>16. No. of Water User Committees (WUCs) formed</td>
<td>The indicator measures the number of Water User Committees (WUCs) formed for water management. The indicator reflects the participation of local community in the management of water resource.</td>
<td>MININFRA, MINIRENA, Districts</td>
</tr>
<tr>
<td>17. % of WUCs with O&amp;M budget</td>
<td>The indicator measures the proportion of WUCs with recurrent funds to run and maintain the water infrastructure (e.g. water taps) under their jurisdiction and control.</td>
<td>MININFRA, MINIRENA, Districts</td>
</tr>
<tr>
<td>18. % of WUCs headed by women</td>
<td>The indicator measures the proportion of WUCs headed by women</td>
<td>MININFRA, MINIRENA, Districts</td>
</tr>
<tr>
<td>19. No. of functional safe water sources</td>
<td>The indicator measures the performance of water sources. It shows the number of safe water sources which are functional.</td>
<td>MININFRA, MINIRENA, District</td>
</tr>
<tr>
<td>20. % of water spring catchments protected according to national standard</td>
<td>The indicator measures the proportion of water spring catchments protected according to national standard</td>
<td>District, MININFRA, MINIRENA</td>
</tr>
<tr>
<td>21. Area/ length of lakeshores and river/ stream banks protected or sustainably managed (Km2 or Ha)</td>
<td>The indicators measures Area or Length of lakeshores and river/ stream banks protected or sustainably managed (Km2 or Ha)</td>
<td>MINIRENA, Districts</td>
</tr>
<tr>
<td>22. % of farmers with access to and using inorganic &amp; organic fertilizers</td>
<td>The indicator measures the proportion of farmers who have the capacity to access to and are using inorganic and organic fertilizers( keep livestock and have money to buy fertilizer) and have knowledge of how to apply fertilizer to different crops or extension services exist to provide technical advise to farmers.</td>
<td>MINAGRI, EICV, District</td>
</tr>
<tr>
<td>23. % of farmers practicing soil conservation technologies</td>
<td>This indicator measures the proportion of farmers undertaking soil conservation technologies such as terracing; forestation and reforestation, planting grasses (e.g. pasture along terraces, etc.) to protect their farms and water catchments areas on the ridges from soil erosion caused by water runoff.</td>
<td>MINAGRI, District</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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</tr>
<tr>
<td>24. use of rainwater harvesting/ water conservation technologies</td>
<td>The indicator measures proportion who have adapted and use the rainwater harvesting/ water conservation technologies</td>
<td>MINIFRA, EICV, Districts</td>
</tr>
<tr>
<td>25. % of households and institutions with access to solid waste management facilities in urban areas</td>
<td>The indicator measures the proportion of households and institutions in urban areas that have access to solid waste facilities to manage solid wastes to improve the sanitation conditions.</td>
<td>EICV, DHS, MINIRENA, PVK and District town councils.</td>
</tr>
<tr>
<td>26. % of households and public institutions with access to solid waste management facilities in rural areas</td>
<td>The indicator measures the proportion of households and institutions in rural areas that have access to solid waste facilities to manage solid wastes to improve the sanitation conditions.</td>
<td>EICV, DHS, MINIRENA, PVK and District town councils.</td>
</tr>
<tr>
<td>27. % of HAMS in schools and PHAST in midugudu actively functioning</td>
<td>The indicator measures the of HAMS in and PHAST in midugudu functioning.</td>
<td>MINEDUC, Districts</td>
</tr>
<tr>
<td>28. % of schools with latrines as per standards</td>
<td>The indicator measures the proportion of schools that have improved latrines constructed per standards and have separate latrines for girls and boys.</td>
<td>EICV, DHS, MINEDUC, Districts</td>
</tr>
<tr>
<td>29. % of health centres with latrines</td>
<td>The indicator measures the proportion of health centres who have improved latrines constructed per standards and have separate latrines for women and men.</td>
<td>EICV, DHS, MOH, District reports</td>
</tr>
<tr>
<td>30. Number of public latrines with the hygienic standards in the public area</td>
<td>The indicator measures the number of improved public latrines in public areas with the hygienic standards.</td>
<td>EICV, DHS, MOH, District reports</td>
</tr>
<tr>
<td>31. % of publics latrines with hygienic standards in the public institutions</td>
<td>The indicators measure the proportion of public latrines with hygienic standards and have separate doors for women and men in public institutions.</td>
<td>EICV, DHS, MOH, District reports</td>
</tr>
<tr>
<td>32. % of km of rainwater drainage increased in urban area</td>
<td>The indicator measures proportion of increase in length of rainwater drainage system in urban areas.</td>
<td>PVK and District town councils</td>
</tr>
<tr>
<td>33. % of households with rainwater catchments systems</td>
<td>The indicator measures the proportion of households with rainwater catchments systems, such as water tanks, for water harvesting or drainage system to take rainwater to mainstream drainage system.</td>
<td>EICV, Districts</td>
</tr>
<tr>
<td>34. Local Government budgets set aside for waste management</td>
<td>The indicator measures the amount of funds the local government (districts) have been set aside or allocated to waste management. It shows the extent of local government commitment to improve waste management.</td>
<td>EICV, Districts.</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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</tr>
<tr>
<td>35. No. of public waste management sensitization meetings held in urban areas</td>
<td>The indicator measures the number of sensitization meetings held in urban areas to impart knowledge and awareness on public waste management.</td>
<td>PVK and District town councils</td>
</tr>
<tr>
<td>36. Operational drainage systems in urban areas</td>
<td>The indicator measures the proportion of drainage system which is in good condition and operational</td>
<td>PVK and District town councils</td>
</tr>
<tr>
<td>37. No. of Public-private partnerships in solid waste management initiated &amp; operational</td>
<td>The indicator measures the number of Public-private partnerships in solid waste management initiated &amp; operational</td>
<td>EICV, MINIRENA, REMA and Districts.</td>
</tr>
<tr>
<td>38. % of local governments with byelaws or ordinances on solid waste management</td>
<td>The indicator measures the proportion of local governments with byelaws or ordinances on solid waste management. It shows commitment of the government to decentralisation of solid waste management and ensures that solid waste management is enforced byelaws or ordinance.</td>
<td>MINALOC, MINIRENA, REMA, Districts</td>
</tr>
<tr>
<td>39. Legal and regulatory framework for pollution control implemented by public and private institutions</td>
<td>The indicator measures the proportion of legal and regulatory framework for control of pollution to show the extent of adoption and implementation of legal and regulatory control of pollution by public and private entities and the effectiveness of pollution regulating institutions.</td>
<td>MINIRENA, REMA, RDB</td>
</tr>
<tr>
<td>40. Municipal &amp; solid waste management plans</td>
<td>The indicator measures the availability of Municipal &amp; solid waste management plans to deal with control and management of solid wastes in city and town councils</td>
<td></td>
</tr>
<tr>
<td>41. Existence of resettlement plan &amp; approved budget for people in wetlands and steep hills.</td>
<td>The indicator measures the preparedness to resettle people from wetlands through preparing resettlement plan and budget for the purpose.</td>
<td>MINAGRI, MINIRENA and Districts.</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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</tr>
<tr>
<td>42. No. of sensitization meetings held on environmental disasters</td>
<td>The indicator measures the number of sensitisation meetings held on environmental disasters involving training, drills and rehearsals to create awareness of environmental disasters but also test and develop disaster response programmes.</td>
<td>MINIRENA, The Disaster Commission, Districts.</td>
</tr>
<tr>
<td>43. No. of grouped settlements (midugudu) sites evaluated for environmental suitability</td>
<td>The indicator measures number of grouped settlements (midugudu) sites which have undergone test or evaluation for environment sustainability are suitable for settlement.</td>
<td>MINIRENA, MINALOC, REMA, RDB, DISTRICTS</td>
</tr>
<tr>
<td>44. % of people living in slum areas</td>
<td>The indicator measures the proportion of people still living in slum areas. It is a proxy indicator to reflect the successor no success to improve the habitat conditions in urban areas.</td>
<td>EICV, PVK and District town councils.</td>
</tr>
<tr>
<td>45. No. of households who have been rendered homeless or lost property due to floods &amp; landslides</td>
<td>The indicator measures number of households who have been rendered homeless or lost property due to floods &amp; landslides.</td>
<td>MINIRENA, The Disaster Management Unit, Districts.</td>
</tr>
<tr>
<td>46. No. of human deaths or injuries due to floods or landslides</td>
<td>The indicator measures the total number of deaths and injuries caused from natural disasters per year.</td>
<td>MINIRENA, The Disaster management Unit, Districts.</td>
</tr>
<tr>
<td>47 Households rendered homeless from floods per year by income / wealth quintiles</td>
<td>The indicator measures the total number of households with their primary source of dwelling destroyed as a result of natural disasters per year disaggregated by income and wealth quintiles to get the picture of the extent to which poor households are affected</td>
<td>MINIRENA, The disaster management unit, Districts</td>
</tr>
<tr>
<td>48. % of National (or district) budget spent on disaster mitigation</td>
<td>The indicator measures the percentage reduction in the period for approval period for EIA certificate per project. The indicator reflects the efficiency and effectiveness of the institution responsible for approval of EIA of projects.</td>
<td>REMA, RDB.</td>
</tr>
<tr>
<td>49. Number of projects compliant to national environmental standards</td>
<td>The indicator measures the number of projects which have undergone EIA to be compliant to national environmental standards.</td>
<td>REMA, MINIRENA, Districts.</td>
</tr>
<tr>
<td>50. Annual percentage of land use complying with land use master plan</td>
<td>The indicator measures annual proportion of land use complying with land use master plan.</td>
<td>NLC, Districts.</td>
</tr>
<tr>
<td>51. % of wood used as fuel by major users such as industries and community cooking replaced by peat</td>
<td>The indicator measures the proportion of wood used as fuel by major users such as industries and community cooking that have been replaced by peat as source of energy.</td>
<td>EICV, REMA, MINIRENA, Districts.</td>
</tr>
<tr>
<td>52. % of local-level mining operations are meeting environmental standards</td>
<td>The indicator measures the proportion of local level mining operations that are meeting the environmental standards.</td>
<td>REMA, Districts.</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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<tr>
<td>53. Area (Ha) of steep hills &amp; mountains and rangelands protected from human activities</td>
<td>This indicator measures the area of hills, mountains and range land designated as protected from human activities.</td>
<td>REMA reports, MINIRENA, Districts</td>
</tr>
<tr>
<td>54. % of rural households accessing credit from financial instruments using land as collateral</td>
<td>This indicator measures the area of hills, mountains and range land designated as protected from human activities.</td>
<td>REMA reports, MINIRENA, Districts</td>
</tr>
<tr>
<td>55. % of districts which have formulated &amp; are implementing anti-erosion regulations &amp; byelaws</td>
<td>The indicator measures the integration of anti-erosion regulations and bylaws in their planning process are implementing them.</td>
<td>District DDPs, IMIHIGO, and Districts reports</td>
</tr>
<tr>
<td>56. Proportion of public land set aside for forestry activities;</td>
<td>This measures the area of state/public land available for forestry activities</td>
<td>MINIRENA, MINAGRI Districts</td>
</tr>
<tr>
<td>57. % of forests managed through collaborative arrangements with local communities</td>
<td>The indicators measures the proportion of forestry owned and managed by local communities at akagali and mudguard levels.</td>
<td>NAFA, Districts</td>
</tr>
<tr>
<td>58. % of bare(degraded) hills planted with trees</td>
<td>This measures the proportion of area of bare hills and mountain ranges planted by trees(public and private)</td>
<td>MINIRENA, MINAGRI, District DDPS and reports</td>
</tr>
<tr>
<td>59. No. of biodiversity-based enterprises managed by or employing the poor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60. Proportion population using solid fuels</td>
<td>Proportion of population using firewood, dung and crop residues as primary fuel for cooking and heating primary fuel for cooking and heating</td>
<td></td>
</tr>
<tr>
<td>61. % of households &amp; industries using fuel wood as a source of energy for cooking</td>
<td>This measures the proportion of households and industries using fuel wood as a source of energy for cooking</td>
<td>EICV, MINIRENA, Districts</td>
</tr>
<tr>
<td>62. % of households using energy saving stoves</td>
<td>The indicator reflects the impact of use of improved cook stoves on the conservation of forestry. It measures the decrease of consumption of firewood by households who adopted the improved cooking stoves</td>
<td>EICV, MINIRENA, Districts</td>
</tr>
<tr>
<td>63. Proportion of wetlands that is protected from intensive human activities</td>
<td>The indicators measures the proportion of wetlands protected and designated as sites not be used for intensive human activities such as agricultural intensification, sugar plantations, mining.</td>
<td>MINIRENA, REMA, MINAGRI, District reports</td>
</tr>
<tr>
<td>64. Proportion of critical wetlands under intensive agricultural use</td>
<td>The indicator measures the proportion of critically degraded ecosystems mapped, assessed and rehabilitated by central government and districts</td>
<td>MINIRENA, REMA, Districts.</td>
</tr>
<tr>
<td>65. % of existing land rights secured through land tenure regularization for effective land administration and land use management</td>
<td>This measures the proportion of land rights provided to households, private and public entities.</td>
<td>MINIRENA, NLC, District reports</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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</tr>
<tr>
<td>66. % of local communities living around critical wetlands involved in ecotourism or recreational activities</td>
<td>The indicator measures the proportion of local community people living around critical wetlands involved in ecotourism and recreational activities supported by ORTPN and government to provide alternative source of occupation and income instead of using the wetlands and protected sites for income.</td>
<td>MINIRENA, ORTPN, REMA, District reports</td>
</tr>
<tr>
<td>67. Area (in Ha) of bare(degraded) hills planted with trees &amp; soil stabilizing grasses</td>
<td>This indicator measures the area of bare hills that is protected against soil erosion through soil and water conservation and by anti-erosion regulations and bylaws.</td>
<td>MINIRENA, NLC, Districts</td>
</tr>
<tr>
<td>68 % of rural water supply systems functional at the time of spot checks in rural and urban areas</td>
<td>These measures the proportion of rural water systems is functional at the time of spot checks in rural and urban areas. The indicator reflects the working conditions and efficiency of water infrastructures.</td>
<td>MINNFRA, MINIRENA, Districts</td>
</tr>
<tr>
<td>69. % of rural piped water supply systems privately managed</td>
<td>The indicators measures the proportion of rural piped water supply systems privately managed. The indicator seeks to show the extent of liberalisation of management of water supply systems.</td>
<td>MININFRA, MINIRENA, Districts</td>
</tr>
<tr>
<td>70. % of water spring catchments protected according to national standard</td>
<td>This indicator measures the proportion of waters spring catchments protected by regulations and bylaws. This indicator seeks to show the water springs which can be regarded as a source of improved drinking water for households in rural areas.</td>
<td>MINIRENA, REMA, Districts</td>
</tr>
<tr>
<td>71. % of dry lands and steep slopes under cultivation or livestock grazing</td>
<td>This a proxy indicator that measures the proportion of dry land, steep slopes under cultivation and livestock grazing to reflect the danger or likelihood of soil erosion and destruction of biodiversity.</td>
<td>MINAGRI, MINIRENA, NLC</td>
</tr>
<tr>
<td>72. % of rural households with access to functional latrines</td>
<td>The indicator measures the proportion of households who access to functional and improved latrines in their dwellings or compound or near and accessible public latrine.</td>
<td>EICV, DHS</td>
</tr>
<tr>
<td>73. % Access to Improved Sanitation Facilities in Urban area</td>
<td>The indicator measures an access to improved sanitation facilities in urban areas. It refers to the percentage of the urban population with access to at least adequate excreta disposal facilities (private or shared, but not public) that can effectively prevent human, animal, and insect contact with excreta</td>
<td>EICV, DHS, Districts</td>
</tr>
<tr>
<td>74. % Access to Improved Sanitation Facilities in rural areas(</td>
<td>Access to improved sanitation facilities in rural areas. Refers to the percentage of the rural population with access to at least adequate excreta disposal facilities (private or shared, but not public) that can effectively prevent human, animal, and insect contact with excreta.</td>
<td>EICV, DHS, Districts</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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</tr>
<tr>
<td>75. Incidences of water-use conflicts</td>
<td>Sanitation is a basic human need as households without sanitation are more likely to be exposed to environmental pollution and disease. This indicator reflects the portion of the total households in Rwanda that are with and without basic sanitation infrastructure</td>
<td>MINIRENA, MINALOC, Districts</td>
</tr>
<tr>
<td>76. Proportion of watersheds protected</td>
<td>The indicator measures the proportion of watersheds protected by soil conservation measures like terracing, forestation/reforestation and by anti-soil erosion regulations and bylaws.</td>
<td>MINAGRI, MINIRENA, Districts</td>
</tr>
<tr>
<td>77. % of people with less 1 Ha of land who have regular &amp; sustained off-farm employment</td>
<td>The indicator measures the proportion of households with less than one hectare with sustainable off-farm employment. The indicator seeks to show the importance of off-farm employment to the households. When the indicator is disaggregated into households with different scales of land tenure, the indicator can also show the income from off-farm going to landless.</td>
<td>EICV, MINAGRI, DHS</td>
</tr>
<tr>
<td>78. Frequency of solid waste transportation in areas occupied by the poor</td>
<td>The indicator refers/ measures the number of times per week (frequency) the city council/ town council collects and transports solid waste from areas occupied by the poor to the dump areas for solid wastes.</td>
<td>MINIRENA, Districts</td>
</tr>
<tr>
<td>79. % of people resettled from wetlands, steep hills or extremely dry rangelands</td>
<td>The indicator measures the proportion of population moved from prone to flooding, land slides and drought. This involves people settled in wetlands, steep hills or extremely dry rangeland, people living in areas prone to long drought areas and people living in substandard housing.</td>
<td>MINERENA, REMA, Districts</td>
</tr>
<tr>
<td>80. % of people living in substandard housing</td>
<td>The indicator measures seek to measure the proportion of poor people living in cities and towns. The indicator reflects the performance of efforts to improve housing in slum areas and to bring the slums in mainstream conditions of the better part of cities and towns (reducing slums).</td>
<td>EICV, DHS, population based surveys, city/ town reports.</td>
</tr>
<tr>
<td>81. % of schools integrating environmental programmes into school curriculum</td>
<td>The indicator measures the proportion of schools who have integrated and implementing environmental programmes such as hand washing, improved latrines, etc, into their school curriculum.</td>
<td>MINEDUC, MINIRENA, Districts</td>
</tr>
<tr>
<td>82. % of sectors integrating environmental programmes into their SSP &amp; M &amp; E</td>
<td>The indicator refers to the proportion of sectors that have mainstreamed environment programmes such as hill terracing.</td>
<td>MINIRENA, Districts</td>
</tr>
<tr>
<td>83. % of government funds allocation and spent on environment</td>
<td>This indicator measures the financial resources allocated by the government to REMA, Environment issues in Ministries and Organisations dealing with environment as part of the national budget expenditure</td>
<td>MINECOFIN, REMA, MINAGRI, MININFRA, RDB, District DDPs, and MIHIGO.</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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</tr>
<tr>
<td>84. % of Community Development Funds allocated to and spent on environmental initiatives</td>
<td>This indicator measures the financial resources allocated by the Community Development Funds (CDF) allocated to and spent on environmental initiatives.</td>
<td>CDF, REMA, MINIRENA</td>
</tr>
<tr>
<td>85. % of central and decentralized institutions with environmental regulations and guidelines functioning</td>
<td>The indicator measures the proportion of central and decentralized institutions that have mainstreamed environmental regulations and guidelines into their policies and plans and have implementing them.</td>
<td>REMA, MINIRENA, Districts.</td>
</tr>
<tr>
<td>86. % of rural land that is registered/titled</td>
<td>The indicator measures the proportion of rural land that is registered.</td>
<td>MINIRENA, LCR and Districts.</td>
</tr>
<tr>
<td>87. No. of h/holds with access to co-legal owned land rights</td>
<td>The indicator measures the number of households with registered land titled, including women and child headed households.</td>
<td>MINIRENA, LCR and Districts.</td>
</tr>
<tr>
<td>88. % of women and child headed households with land is titled</td>
<td>The indicators measure the proportion of women and child headed households who have land titles. The indicator reflects the access to land asset for production to the most vulnerable and poor section of Rwandan society.</td>
<td>EICV, MINIRENA, REMA and District reports</td>
</tr>
<tr>
<td>89. % privately held land registered/ titled</td>
<td>The indicator measures the proportion of registered/titled land that is owned privately.</td>
<td>MINIRENA, LCR REMA, and District reports</td>
</tr>
<tr>
<td>90. This measures the proportion of women with land titles relative to the total no. of people given land titles.</td>
<td></td>
<td>MINIRENA,MINAGRI and District</td>
</tr>
<tr>
<td>91. Radical and progressive terraces (ha)</td>
<td>This measures the land area (ha) that has undergone radical and progressive terracing.</td>
<td>MINAGRI, District</td>
</tr>
<tr>
<td>92. % of hilly areas which have been terraced or under soil conservation</td>
<td>The proportion of mountain ranges and hills that have undergone soil conservation, including terracing.</td>
<td>MINAGRI, MINIRENA, NLC, Districts</td>
</tr>
<tr>
<td>93. % of population adoption of carbon neutral energy sources</td>
<td>This indicator measures the proportion of population who are adopting carbon neutral energy sources such as electricity from water and solar energy, gas, etc for cooking and lighting.</td>
<td>REMA, MINERENA, Districts ,EICV</td>
</tr>
<tr>
<td>94. % of women and vulnerable groups engaged in forestry and agro-forestry</td>
<td>The indicators measures the proportion of women and vulnerable groups/households engaged and getting their livelihood in forestry and agro-forestry. The indicator reflects the contribution of women and vulnerable groups in the destruction of forestry and environmental problems such as unreliability of rainfall and land degradation.</td>
<td>MINIRENA, EICV, District reports</td>
</tr>
<tr>
<td>Name of indicator</td>
<td>What the indicator is measuring</td>
<td>Source of Available data</td>
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</tr>
<tr>
<td>95. % of natural forests protected and conserved (buffer zone) to facilitate tourism</td>
<td>This indicator measures the proportion of natural forest with buffer zones to protect and conserve 6 forested sites of about 1,000 ha/site (Mukura, Busaga, Volcanoes, Nyungwe, Makera and Akagera) to protect biodiversity and facilitate tourism.</td>
<td>ORTPN, MINIRENA, REMA and Districts</td>
</tr>
<tr>
<td>96. % of riverbanks and lakes protected by tree belts</td>
<td>The indicator measures the proportion of river banks and lakes protected from water run off, soil erosion using tree belts above river and lake banks (buffer zone).</td>
<td>MINIRENA, REMA, Districts</td>
</tr>
<tr>
<td>97. % of Infrastructure (roads, bridges, schools, hospitals, etc) protected against runoff using vegetation cover</td>
<td>This indicator measures the proportion of infrastructure (roads, bridges, schools, hospitals, etc) protected against water runoff using trees.</td>
<td>MINEDUC, MOH, Districts</td>
</tr>
<tr>
<td>98. % of area of the land protected to maintain biodiversity</td>
<td>The indicator measures the Ratio of Area Protected to Maintain Biological Diversity to Surface Area (expressed in % terms). The indicator shows the commitment of the government of Rwanda to safeguard and protect the biodiversity.</td>
<td>MINIRENA, REMA, Districts.</td>
</tr>
<tr>
<td>99. Proportion of critical wetlands under intensive agricultural use</td>
<td>The indicator measures the proportion fragile and degraded wetlands still under intensive agricultural use and lack protection.</td>
<td>MINIRENA, REMA, MINAGRI, District reports</td>
</tr>
<tr>
<td>100. % Critically degraded ecosystems mapped, assessed and rehabilitated</td>
<td>The indicator measures the proportion of critically degraded ecosystems mapped, assessed and rehabilitated by central government and districts.</td>
<td>MINIRENA, REMA, Districts.</td>
</tr>
<tr>
<td>101. Number of km of safe water infrastructure network developed</td>
<td>The indicator measures the number of km of water infrastructures constructed to supply safe and clean water. It is a proxy indicators showing the effort and commitment of the government to supply safe water to its people through developing and construction safe water infrastructure network in the country.</td>
<td>MININFRA, Districts.</td>
</tr>
<tr>
<td>102. % of farm households using Inorganic mineral fertilizer</td>
<td>The indicator measures the proportion of farm households using mineral fertilisers to improve soil fertility for crop farming to increase crop productivity per hectare.</td>
<td>MINAGRI, EICV, RADA</td>
</tr>
<tr>
<td>103. % of farm households using Organic fertilizers</td>
<td>The indicator measures the proportion of farm households using organic fertilizers to improve soil fertility for crop farming to increase crop productivity per hectare.</td>
<td>MINAGRI, EICV, RADA, Districts.</td>
</tr>
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<td>Name of indicator</td>
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</tr>
<tr>
<td>105. % of farm households using insecticides</td>
<td>The indicator measures the proportion of farm households using insecticides to fight against crop diseases to increase crop productivity per hectare</td>
<td>MINAGRI, EICV, RADA, Districts</td>
</tr>
<tr>
<td>106. % of farm households using insecticides</td>
<td>The indicator measures the proportion of farm households using insecticides to fight against crop diseases to increase crop productivity per hectare</td>
<td>MINAGRI, EICV, RADA, Districts</td>
</tr>
<tr>
<td>107. Existence of operational land registration services at district &amp; sector level</td>
<td>The indicator measures the availability of operational land registration services at district &amp; sector level. The indicator shows the extent of decentralisation of land legislation services to district and sectors.</td>
<td>MINALOC, MINIRENA, Districts</td>
</tr>
<tr>
<td>108. Local leaders trained in land dispute resolution</td>
<td>The indicator measures the capacity of local leaders to resolve land disputes through training local leaders in land dispute resolution.</td>
<td>NLC, Districts</td>
</tr>
<tr>
<td>109. Annual sensitization meetings held on land tenure</td>
<td>The indicator measures the number of sensitization meetings held on land tenure per year. The indicator reflects the degree of understanding of land tenure issue brought about by training them by holding annual sensitisation meetings on land tenure.</td>
<td>MINIRENA, NLC</td>
</tr>
<tr>
<td>110. No. of tree nurseries established (at cell &amp; sector level)</td>
<td>The indicator measures the community capacity to establish nurseries to provide seedlings for forestation and reforestation. The indicator shows the number of nurseries established at cell (umudugudu) and sector levels</td>
<td>NAFA, District reports</td>
</tr>
<tr>
<td>111. % of irrigation &amp; other water-intensive projects that have been subjected to environmental impact assessment</td>
<td>The indicator measures the proportion of the irrigation and water projects which have been subjected to environment impact assessment test.</td>
<td>MINAGRI, MININFRA, REMA</td>
</tr>
<tr>
<td>112. Invasive non-native species that are threatening to ecosystems, habitats, or species</td>
<td>The indicator measures the presence or absence of invasive non-native species that are threatening to ecosystems, habitats, or species. The identification and monitoring population trends provide early warning and improve opportunities to respond with appropriate management tactics. There are no data complete on the indicator. There is need to list all of the invasive non-native species in the country. Conduct individual population studies to identify population trends for each site identified.</td>
<td>MINIRENA</td>
</tr>
</tbody>
</table>
### Annex 8: Drive Pressure State Response Indicators

<table>
<thead>
<tr>
<th>Indicators of Driver</th>
<th>Indicators of Pressure</th>
<th>Indicators of State</th>
<th>Indicators of Impact</th>
<th>Indicators Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Intensification of agricultural activities</td>
<td>• Incidence of water stress</td>
<td>• Proportion of total land area under forest &amp; tree cover employing the poor</td>
<td>• GDP growth rate</td>
<td>• Proportion of arable land that is protected from erosion</td>
</tr>
<tr>
<td>• High population density</td>
<td>• Percentage of the poor living on marginal land such as fragile highland areas</td>
<td>• % of threaten species to total native species</td>
<td>• Share of population living below poverty line (%)</td>
<td>• Area of land protected to maintain biological diversity</td>
</tr>
<tr>
<td>• Human settlements</td>
<td>• Proportion of critical wetlands under intensive agricultural use</td>
<td>• Access to improved sanitation facilities in urban areas</td>
<td>• Economic inequality (Gini coefficient of consumption)</td>
<td>• % of irrigation &amp; other water-intensive projects that have been subjected to environmental impact assessment</td>
</tr>
<tr>
<td>• The mountainous and hilly conditionons</td>
<td>• % of dry lands and steep slopes under cultivation or livestock grazing</td>
<td>• Access to improved sanitation facilities in rural areas</td>
<td>• Share of population living in extreme poverty (%)</td>
<td>• % of the public/private programmes providing biodegradable alternatives to banned items</td>
</tr>
<tr>
<td>• Economic growth and development</td>
<td>• % of people living in substandard housing</td>
<td>• Slum areas with improved drainage</td>
<td>• Poverty incidence among people living in female-headed households (%) (not in EDPRS)</td>
<td>• Economic development</td>
</tr>
<tr>
<td>• Insufficient involvement and empowerment of people in environmental issues</td>
<td>• Proportion of critical wetlands under intensive agricultural use</td>
<td>• No. of functional safe water sources</td>
<td>• % Increase in the share of rural pop. below national poverty line</td>
<td>• Proportion of tree nurseries stocked with threatened tree species per district</td>
</tr>
<tr>
<td>• Increase in trade</td>
<td>• % of farm households using Inorganic mineral fertilizer</td>
<td>• % of farmers with access to and using inorganic &amp; organic fertilizers</td>
<td>• % Increase fall of population with less than min. food requirements</td>
<td>• % of farmers who have planted medicinal plant species</td>
</tr>
<tr>
<td>• Poverty profile</td>
<td>• % of farm households using Organic fertilizers</td>
<td>• Incidences of water-borne diseases among under-five year olds</td>
<td>• % contribution of natural resource exploitation to national economy</td>
<td>• % of area of the land protected to maintain biodiversity</td>
</tr>
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<td>Intensification of agricultural activities</td>
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<td>GDP growth rate</td>
<td>Proportion of arable land that is protected from erosion</td>
</tr>
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<td>High population density</td>
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<td>% of threaten species to total native species</td>
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<td>Area of land protected to maintain biological diversity</td>
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<td>% of the public/private programmes providing biodegradable alternatives to banned items</td>
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<td>Economic growth and development</td>
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<td>Insufficient involvement and empowerment of people in environmental issues</td>
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</tr>
<tr>
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</tr>
<tr>
<td>Increases in trade</td>
<td>% of farm households using insecticides</td>
<td>Incidences of malaria among women and young children</td>
<td>Annual fuel wood consumption as a proportion of total standing volume</td>
<td>Proportion of wetlands conserved/ sustainably used</td>
</tr>
<tr>
<td>Increases in transportation</td>
<td>Invasive non-native species that are threatening to ecosystems, habitats, or species</td>
<td>% of industries &amp; other commercial entities with waste water treatment facilities</td>
<td>Prevalence of diarrhoea</td>
<td>% of protected areas with biodiversity preservation</td>
</tr>
<tr>
<td>Global warming</td>
<td>Population growth</td>
<td>% of households with sustainable use of water for production</td>
<td>Annual death rate from malaria among under-fives &amp; pregnant women</td>
<td>No. of trainings in community based natural resources management</td>
</tr>
<tr>
<td>Rangeland carrying capacity</td>
<td>Urbanisation</td>
<td>% of households and institutions with access to solid waste management facilities in urban areas</td>
<td>% of total population who are food insecure</td>
<td>% of degraded wetlands rehabilitated</td>
</tr>
<tr>
<td>Waste management systems appropriate for the environmental conditions</td>
<td>Climate change</td>
<td>% of households and public institutions with access to solid waste management facilities in rural areas</td>
<td>% increase in per capita income among rural households</td>
<td>Ha of critical water catchments identified &amp; protected</td>
</tr>
<tr>
<td>Health and Environmental conditions</td>
<td>% of HAMS in schools and PHAST in midugudu actively functioning</td>
<td>Incidences of deaths, illnesses or loss/destruction of property due to floods, landslides or drought</td>
<td>No. of Water User Committees (WUCs) formed</td>
<td>% of water spring catchments protected according to national standard</td>
</tr>
<tr>
<td></td>
<td>% of schools with latrines as per standards</td>
<td>Incidences of malnutrition among under-five year olds</td>
<td></td>
<td>Area/ length of lakeshores and river/ stream banks protected or sustainably managed (Km² or Ha)</td>
</tr>
<tr>
<td></td>
<td>% of health centres with latrines</td>
<td>Infant mortality rate</td>
<td></td>
<td>% of farmers practicing soil conservation technologies</td>
</tr>
<tr>
<td></td>
<td>Number of public latrines with the hygienic standards in the public area</td>
<td>Soil loss( in t/ha/year)</td>
<td></td>
<td>use of rainwater harvesting/ water conservation technologies</td>
</tr>
<tr>
<td></td>
<td>% of households with rainwater catchments systems</td>
<td>Water availability</td>
<td></td>
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</tbody>
</table>
## THE DRIVE PRESSURE STATE RESPONSE INDICATORS

<table>
<thead>
<tr>
<th>Indicators of Driver</th>
<th>Indicators of Pressure</th>
<th>Indicators of State</th>
<th>Indicators of Impact</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Operational drainage systems in urban areas</td>
<td>• % GDP growth for all crops, livestock products</td>
<td>• Local Government budgets set aside for waste management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• % of local governments with byelaws or ordinances on solid waste management</td>
<td>• Per capital crop production</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Municipal &amp; solid waste management plans</td>
<td>• % of rural households with secure land tenure</td>
<td>• No. of Public-private partnerships in solid waste management initiated &amp; operational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Existence of resettlement plan &amp; approved budget for people in wetlands and steep hills.</td>
<td>• Decrease the emission of greenhouse gases in the atmosphere (CO2,CH4,NO2)</td>
<td>• No. of sensitization meetings held on environmental disasters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• % of people living in slum areas</td>
<td>• Rwanda land use per household per hectare</td>
<td>• No. of grouped settlements (midugudu) sites evaluated for environmental suitability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• No. of households who have been rendered homeless or lost property due to floods &amp; landslides</td>
<td>• % of households &amp; industries using fuel wood as a source of energy for cooking</td>
<td>• % of National (or district) budget spent on disaster mitigation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• No. of human deaths or injuries due to floods or landslides</td>
<td>• Energy use per unit of GDP</td>
<td>• Area (Ha) of steep hills &amp; mountains and rangelands protected from human activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Households rendered homeless from floods per year by income / wealth quintiles</td>
<td>• % decrease in the consumption of firewood through the use of improved cook stoves</td>
<td>• % of bare(degraded) hills planted with trees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THE DRIVE PRESSURE STATE RESPONSE INDICATORS</td>
<td>Indicators of Driver</td>
<td>Indicators of Pressure</td>
<td>Indicators of State</td>
<td>Indicators of Impact</td>
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<td>• Increases in trade</td>
<td>• % of farm households using insecticides</td>
<td>• Incidences of malaria among women and young children</td>
<td>• Annual fuel wood consumption as a proportion of total standing volume</td>
<td>• Proportion of wetlands conserved/sustainably used</td>
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<td>• Increases in transportation</td>
<td>• Invasive non-native species threatening to ecosystems, habitats, or species</td>
<td>• % of industries &amp; other commercial entities with waste water treatment facilities</td>
<td>• Prevalence of diarrhoea</td>
<td>• % of protected areas with biodiversity preservation</td>
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<tr>
<td>• Global warming</td>
<td>• Population growth</td>
<td>• % of households with sustainable use of water for production</td>
<td>• Annual death rate from malaria among under-fives &amp; pregnant women</td>
<td>• No. of trainings in community based natural resources management</td>
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<tr>
<td>• Rangeland carrying capacity</td>
<td>• Urbanisation</td>
<td>• % of households and institutions with access to solid waste management facilities in urban areas</td>
<td>• % of total population who are food insecure</td>
<td>• % of degraded wetlands rehabilitated</td>
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<td>• Waste management systems appropriate for the environmental conditions</td>
<td>• Climate change</td>
<td>• % of households and public institutions with access to solid waste management facilities in rural areas</td>
<td>• % increase in per capita income among rural households</td>
<td>• Ha of critical water catchments identified &amp; protected</td>
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<tr>
<td>• Health and Environmental conditions</td>
<td>• % of HAMS in schools and PHAST in midugudu actively functioning</td>
<td>• Incidences of deaths, illnesses or loss/destruction of property due to floods, landslides or drought</td>
<td>• No. of Water User Committees (WUCs) formed</td>
<td>• Area/length of lakeshores and river/stream banks protected or sustainably managed (Km2 or Ha)</td>
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<td>• % of schools with latrines as per standards</td>
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<td>Number of public latrines with the hygienic standards in the public area</td>
<td>• Soil loss in t/ha/year</td>
<td>• % of farmers practicing soil conservation technologies</td>
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<td>• % of households with rainwater catchments systems</td>
<td>• Water availability</td>
<td>• use of rainwater harvesting/water conservation technologies</td>
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## THE DRIVE PRESSURE STATE RESPONSE INDICATORS

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<td>Operational drainage systems in urban areas</td>
<td>% GDP growth for all crops, livestock products</td>
<td>Local Government budgets set aside for waste management</td>
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<td>% of local governments with byelaws or ordinances on solid waste management</td>
<td>Per capital crop production</td>
<td>No. of public waste management sensitization meetings held in urban areas</td>
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<td>Municipal &amp; solid waste management plans</td>
<td>% of rural households with secure land tenure</td>
<td>No. of Public-private partnerships in solid waste management initiated &amp; operational</td>
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<td>Existence of resettlement plan &amp; approved budget for people in wetlands and steep hills.</td>
<td>Decrease the emission of greenhouse gases in the atmosphere (CO$_2$,CH$_4$,NO$_2$)</td>
<td>No. of sensitization meetings held on environmental disasters</td>
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<td>% of people living in slum areas</td>
<td>Rwanda land use per household per hectare</td>
<td>No. of grouped settlements (midugudu) sites evaluated for environmental suitability</td>
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<td>No. of households who have been rendered homeless or lost property due to floods &amp; landslides</td>
<td>% of households &amp; industries using fuel wood as a source of energy for cooking</td>
<td>% of National (or district) budget spent on disaster mitigation</td>
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<td>No. of human deaths or injuries due to floods or landslides</td>
<td>Energy use per unit of GDP</td>
<td>Area (Ha) of steep hills &amp; mountains and rangelands protected from human activities</td>
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<td>Households rendered homeless from floods per year by income / wealth quintiles</td>
<td>% decrease in the consumption of firewood through the use of improved cook stoves</td>
<td>% of bare(degraded) hills planted with trees</td>
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Annex 9: Disaggregation (organisation) of indicators by themes

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<td>7. Per capita water use among poor households</td>
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<td>20. Access to Improved Sanitation Facilities (Rural)</td>
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<td>25.</td>
<td>Percentage of child caregivers and food prepares with appropriate hand washing behaviour</td>
</tr>
<tr>
<td>26.</td>
<td>% of people with knowledge of basic sanitation &amp; hygiene behaviour;</td>
</tr>
<tr>
<td>27.</td>
<td>% of HAMS in schools and PHAST in midugudu actively functioning</td>
</tr>
<tr>
<td>28.</td>
<td>% of households with hand-washing facility</td>
</tr>
<tr>
<td>29.</td>
<td>% of rural households with hygienic latrines</td>
</tr>
<tr>
<td>30.</td>
<td>% of people with knowledge and/or awareness about transmission of diarrhoea diseases.</td>
</tr>
<tr>
<td>31.</td>
<td>% of schools with latrines as per standards</td>
</tr>
<tr>
<td>32.</td>
<td>% of health centres with latrines</td>
</tr>
<tr>
<td>33.</td>
<td>Number of public latrines with the hygienic standards in the public area</td>
</tr>
<tr>
<td>34.</td>
<td>% of publics latrines with hygienic standards in the public institutions</td>
</tr>
<tr>
<td>35.</td>
<td>% Mean daily caloric availability/intake per person</td>
</tr>
</tbody>
</table>

### II. General Economic and Poverty Indicators

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>GDP growth rate</td>
</tr>
<tr>
<td>2.</td>
<td>Share of population living below poverty line (%)</td>
</tr>
<tr>
<td>3.</td>
<td>Economic inequality (Gini coefficient of consumption)</td>
</tr>
<tr>
<td>4.</td>
<td>Share of population living in extreme poverty (%)</td>
</tr>
<tr>
<td>5.</td>
<td>% Poverty incidence among people living in female-headed households</td>
</tr>
<tr>
<td>6.</td>
<td>Per capita real income among rural households</td>
</tr>
<tr>
<td>7.</td>
<td>% fall in the share of rural pop. below national poverty line</td>
</tr>
<tr>
<td>8.</td>
<td>% contribution of natural resource exploitation to national economy</td>
</tr>
</tbody>
</table>
### Disaggregation of indicators by themes

#### III. Water

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water availability</td>
</tr>
<tr>
<td>2</td>
<td>% of water resources complying with quality standards</td>
</tr>
<tr>
<td>3</td>
<td>% of rural water supply systems functional at the time of spot checks in rural and urban areas</td>
</tr>
<tr>
<td>4</td>
<td>% of rural piped water supply systems privately managed</td>
</tr>
<tr>
<td>5</td>
<td>% of rural piped water supply systems privately managed</td>
</tr>
<tr>
<td>6</td>
<td>% of provided water as a proportion of the average water consumption requirements for crop production</td>
</tr>
<tr>
<td>7</td>
<td>% of provided water as a proportion of the average water consumption requirements for livestock per year</td>
</tr>
<tr>
<td>8</td>
<td>Average time spent by women &amp; children collecting water</td>
</tr>
<tr>
<td>9</td>
<td>% of water resources complying with quality standards</td>
</tr>
<tr>
<td>10</td>
<td>Use of rainwater harvesting/ water conservation technologies</td>
</tr>
<tr>
<td>11</td>
<td>Quantity of water used per capita per day</td>
</tr>
<tr>
<td>12</td>
<td>Per capita water use among poor households</td>
</tr>
<tr>
<td>13</td>
<td>Proportion of household income spent on water</td>
</tr>
<tr>
<td>14</td>
<td>% of rural water supply systems functional at the time of spot checks in rural and urban areas</td>
</tr>
<tr>
<td>15</td>
<td>% of rural piped water supply systems privately managed</td>
</tr>
<tr>
<td>16</td>
<td>% of provided water as a proportion of the average water consumption requirements for crop production</td>
</tr>
<tr>
<td>17</td>
<td>% of provided water as a proportion of the average water consumption requirements for livestock per year</td>
</tr>
<tr>
<td>18</td>
<td>% of water spring catchments protected according to national standard</td>
</tr>
<tr>
<td>19</td>
<td>Incidences of water stress</td>
</tr>
<tr>
<td>20</td>
<td>Incidences of water-use conflicts</td>
</tr>
<tr>
<td>21</td>
<td>Proportion of watersheds protected</td>
</tr>
<tr>
<td>22</td>
<td>% of households with sustainable use of water for production</td>
</tr>
<tr>
<td>23</td>
<td>Annual recharge of underground water (Km3/ha)</td>
</tr>
</tbody>
</table>
**Disaggregation of indicators by themes**

| 25. Number of km of safe water infrastructure network developed |
| 26. Periodic water resources inventory undertaken |
| 27. Number of improved water source developed per year |
| 28. Ha of critical water catchments identified & protected |
| 29. No. of functional safe water sources |
| 30. % of water spring catchments protected according to national standard |
| 31. Area/length of lakeshores and river/stream banks protected or sustainably managed (Km2 or Ha) |
| 32. existence of an inventory of water resources in Rwanda |

**IV. Forestry**

| 1. % of forests managed through collaborative arrangements with local communities |
| 2. % of bare(degraded) hills planted with trees |
| 3. Area (in Ha) of bare(degraded) hills planted with trees & soil stabilizing grasses |
| 4. % of forestry cover in the country |
| 5. Quantity of annual household consumption that is derived from forest products |
| 6. % of women and vulnerable groups engaged in forestry and agro-forestry |
| 7. % of natural forests protected and conserved (buffer zone) to facilitate tourism |
| 8. % of riverbanks and lakes protected by tree belts |
| 9. % of infrastructure (roads, bridges, schools, hospitals, etc) protected against runoff using vegetation cover |
| 10. Reduction in annual wood consumption (million cubic metres) |
| 11. No. of collaborative forest management agreements signed & implemented |
| 12. No. of tree nurseries established (at cell & sector level) |
### Disaggregation of indicators by themes

**V. Land**

1. % of rural households with secure land tenure
2. % of existing land rights secured through land tenure regularization for effective land administration and land use management
3. % of rural households accessing credit from financial instruments using land as collateral
4. Proportion of public land set aside for forestry activities;
5. Percentage of the poor living on marginal land such as fragile highland areas
6. Proportion of critical wetlands under intensive agricultural use
7. Proportion of wetlands that is protected from intensive human activities
8. % decrease in the consumption of firewood through the use of improved cook stoves
9. % of dry lands and steep slopes under cultivation or livestock grazing
10. Proportion of wetlands conserved/ sustainably used
11. % of rural land that is registered/titled
12. No. of h/holds with access to co-legal owned land rights
13. % of women and child headed households with land is titled
14. % rights land protected to facilitate investments
15. % privately held land registered/ titled;
16. Proportion issued of land titles owned by women
17. Comprehensive land evaluation / suitability assessment report
18. % of degraded wetlands rehabilitated
19. % of wetlands inventoried
20. % of degraded wetlands rehabilitated
### Disaggregation of indicators by themes

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.</td>
<td>Area (Ha) of steep hills &amp; mountains and rangelands protected from human activities</td>
</tr>
<tr>
<td>22.</td>
<td>% of land mapping conducted to establish productivity potential</td>
</tr>
<tr>
<td><strong>VI. Agriculture</strong></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>% GDP growth for all crops, livestock products</td>
</tr>
<tr>
<td>2.</td>
<td>Annual per capita food production</td>
</tr>
<tr>
<td>3.</td>
<td>Per capita rural crop production</td>
</tr>
<tr>
<td>4.</td>
<td>Area protected against soil erosion</td>
</tr>
<tr>
<td>5.</td>
<td>% of agricultural land protected against soil erosion</td>
</tr>
<tr>
<td>6.</td>
<td>% of non-agricultural land protected against soil erosion</td>
</tr>
<tr>
<td>7.</td>
<td>Proportion of arable land that is protected from erosion</td>
</tr>
<tr>
<td>8.</td>
<td>Rwanda land use per household per hectare</td>
</tr>
<tr>
<td>9.</td>
<td>% of local communities living around critical wetlands involved in ecotourism or recreational activities</td>
</tr>
<tr>
<td>10.</td>
<td>% of household income from agriculture &amp; livestock</td>
</tr>
<tr>
<td>11.</td>
<td>% of people with less 1 Ha of land who have regular &amp; sustained off-farm employment</td>
</tr>
<tr>
<td>12.</td>
<td>Radical and progressive terraces (ha)</td>
</tr>
<tr>
<td>13.</td>
<td>% of hilly areas which have been terraced or under soil conservation</td>
</tr>
<tr>
<td>14.</td>
<td>Area of land sustainably managed against soil erosion and made productive through irrigation</td>
</tr>
<tr>
<td>15.</td>
<td>% of arable land that is protected from erosion and under irrigation</td>
</tr>
<tr>
<td>16.</td>
<td>% of farm households using Inorganic mineral fertilisers</td>
</tr>
<tr>
<td>17.</td>
<td>% of farm households using Organic fertilisers</td>
</tr>
<tr>
<td>18.</td>
<td>% of farm households using insecticides</td>
</tr>
<tr>
<td>19.</td>
<td>Sensitization meetings held on land tenure (annually)</td>
</tr>
</tbody>
</table>
### VII. Air Pollution

1. % of industries & commercial entities using cleaner production mechanisms
2. Per capital consumption of ozone-depleting substances
3. Decrease the emission of greenhouse gases in the atmosphere (CO2, CH4, NO2)
4. Presence of a functional Cleaner Production Centre
5. % of population adoption of carbon neutral energy sources

### VIII. Biodiversity

1. Area of land protected to maintain biological diversity
2. % of protected areas with biodiversity preservation
3. % of threatened species to total native species
4. No. of biodiversity-based enterprises managed by or employing the poor
5. % of area of the land protected to maintain biodiversity
6. % Critically degraded ecosystems mapped, assessed and rehabilitated
7. No. of biodiversity inventories held
8. No. of biodiversity awareness & conservation trainings held
9. Proportion of tree nurseries stocked with threatened tree species per district
10. % of farmers who have planted medicinal plant species

### IX. Energy

1. Percent of residents using traditional fuels
2. % of households & industries using fuel wood as a source of energy for cooking
3. Energy use per unit of GDP
4. Percentage of households using more efficient wood-based technologies for energy
5. Proportion population using solid fuels
6. % of household accessible to alternative energy supplies (Methane, biogas, peat, solar, electricity)
7. No. of households and enterprises with access to electricity
8. % of households using energy saving stoves
9. % of wood used as fuel by major users such as industries and community cooking replaced by peat
### XI. Waste Management Indicators

1. % of urban population that are connected to sewage systems
2. % of industries & other commercial entities with waste water treatment facilities
3. % slum areas with improved drainage systems
4. Number of recycling centres for waste water developed and operational per year
5. % of households and public institutions with access to solid waste management facilities in rural area
6. % of poor HHs with appropriate provisions for disposal of children’s faeces
7. % of km of rainwater drainage increased in urban area
8. % of households with rainwater catchments systems
9. % of public buildings with rainwater catchments
10. Operational drainage systems in urban areas
11. % of poor urban households within 200 metres of solid waste skip
12. Frequency of solid waste transportation in areas occupied by the poor

### XII. Vulnerability indicators (Natural Disaster Indicators)

1. % of total population who are susceptible or exposed to the risk of floods, landslides or drought
2. % of people living in substandard housing
3. % of the public/private programmes providing biodegradable alternatives to banned items
4. Existence of disaster preparedness plan
5. No. of Households who have been rendered homeless or lost property due to floods & landslides
6. Total value (in Frw) of property lost or destroyed by floods & landslides
7. No. of human deaths or injuries due to floods or landslides
8. Households rendered homeless from floods per year by income / wealth quintiles
**XIII. Habitat/ Housing Indicators**

1. % of people living in slum areas
2. No. of slum improvement projects implemented

**XIV. Institutional indicators**

1. % of National (or district) budget spent on disaster mitigation
2. % reduction in the period for approval period for EIA certificate per project
3. Number of projects compliant to national environmental standards
4. Annual percentage of land use complying with land use master plan
5. % of enterprises with EIA certificates
6. Increase number of projects compliant to national environmental standards and reduce approval period for EIA certificate per project
7. % of districts which have formulated & are implementing anti-erosion regulations & byelaws
8. % of irrigation & other water-intensive projects that have been subjected to environmental impact assessment
9. % Legal & regulatory framework for pollution control implemented by public, private entities.
10. % of industries which have undergone environmental audit
11. % of schools integrating environmental programmes into school curriculum
12. % of sectors integrating environmental programmes into their SSP & M & E
13. land productivity (tones of food / ha/ annum)
14. % of rural land that is registered/titled
15. No. of h/holds with access to co-legal owned land rights
16. % of women and child headed households with land is titled
17. % rights land protected to facilitate investments
18. % privately held land registered/titled;
19. Proportion issued of land titles owned by women
20. Comprehensive land evaluation / suitability assessment report
21. % of degraded wetlands rehabilitated
22. % of wetlands inventoried
23. Proportion of wetlands conserved/ sustainably used
### Disaggregation of indicators by themes

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>% of government funds allocation and spent on environment</td>
</tr>
<tr>
<td>14</td>
<td>% of Community Development Funds allocated to and spent on environmental initiatives</td>
</tr>
<tr>
<td>15</td>
<td>Local Government budgets set aside for waste management</td>
</tr>
<tr>
<td>16</td>
<td>% of central and decentralized institutions with environmental regulations and guidelines functioning</td>
</tr>
<tr>
<td>17</td>
<td>% of relevant policy, legislation and institutional frameworks established and operationalised</td>
</tr>
<tr>
<td>18</td>
<td>% of institutions having mainstreamed environment in sector policies, strategies &amp; monitoring systems at both central &amp; local levels</td>
</tr>
<tr>
<td>19</td>
<td>Existence of operational land registration services at district &amp; sector level</td>
</tr>
<tr>
<td>20</td>
<td>Sensitization on access to credit services</td>
</tr>
<tr>
<td>21</td>
<td>% of Agricultural sector budget that is spent on soil conservation activities</td>
</tr>
<tr>
<td>22</td>
<td>No. of trainings in community based natural resources management</td>
</tr>
<tr>
<td>23</td>
<td>No. of Water User Committees (WUCs) formed</td>
</tr>
<tr>
<td>24</td>
<td>% of WUCs with O&amp;M budget</td>
</tr>
<tr>
<td>25</td>
<td>% of WUCs headed by women.</td>
</tr>
<tr>
<td>26</td>
<td>No. of public waste management sensitization meetings held in urban areas</td>
</tr>
<tr>
<td>30</td>
<td>Presence of standards &amp; guidelines for industrial waste</td>
</tr>
<tr>
<td>27</td>
<td>No. of Public-private partnerships in solid waste management initiated &amp; operational</td>
</tr>
<tr>
<td>28</td>
<td>% of local governments with byelaws or ordinances on solid waste management</td>
</tr>
<tr>
<td>29</td>
<td>Trainings held on Cleaner production</td>
</tr>
<tr>
<td>31</td>
<td>Municipal &amp; solid waste management plans</td>
</tr>
<tr>
<td>32</td>
<td>Existence of database &amp; monitoring plan for hazardous wastes</td>
</tr>
<tr>
<td>33</td>
<td>Existence of robust early warning system</td>
</tr>
</tbody>
</table>
Disaggregation of indicators by themes

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>34.</td>
<td>Inventory/ database of Settlements in wetlands &amp; steep hills</td>
</tr>
<tr>
<td>35.</td>
<td>Existence of Resettlement plan &amp; approved budget for people in wetlands and steep hills.</td>
</tr>
<tr>
<td>36.</td>
<td>No. of sensitization meetings held on environmental disasters</td>
</tr>
<tr>
<td>37.</td>
<td>No. of grouped settlements (midugudu) sites evaluated for environmental suitability</td>
</tr>
<tr>
<td>38.</td>
<td>% of local-level mining operations are meeting environmental standards</td>
</tr>
<tr>
<td>39.</td>
<td>Existence &amp; implementation of pro-poor policy &amp; law on wetlands</td>
</tr>
</tbody>
</table>
Annex 10: Disaggregation of Poverty- Environment Indicators within Administrative Levels

Matrix 1: National Level Poverty- Environment Indicators

<table>
<thead>
<tr>
<th>Name of Poverty- Environment Indicators</th>
<th>The institution Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. GDP growth rate</td>
<td>MINECOFIN</td>
</tr>
<tr>
<td>2. Share of population living below poverty line (%)</td>
<td>MINECOFIN</td>
</tr>
<tr>
<td>3. Economic inequality (Gini coefficient of consumption)</td>
<td>MINECOFIN</td>
</tr>
<tr>
<td>4. Share of population living in extreme poverty (%)</td>
<td>MINECOFIN</td>
</tr>
<tr>
<td>5. Poverty incidence among people living in female-headed households (%)</td>
<td>MINECOFIN</td>
</tr>
<tr>
<td>6. Per capita real income among rural households</td>
<td>MINECOFIN</td>
</tr>
<tr>
<td>7. % fall in the share of rural pop. below national poverty line</td>
<td>MINECOFIN</td>
</tr>
<tr>
<td>8. % fall of pop. with less than min. food requirements.</td>
<td>MINAGRI</td>
</tr>
<tr>
<td>9. % contribution of natural resource exploitation to national economy</td>
<td>MINIRENA</td>
</tr>
<tr>
<td>10. Annual fuel wood consumption as a proportion of total standing volume</td>
<td>MINIRENA</td>
</tr>
<tr>
<td>11. Prevalence of diarrhoea</td>
<td>MOH</td>
</tr>
<tr>
<td>12. Annual death rate from malaria among under- fives &amp; pregnant women</td>
<td>MOH</td>
</tr>
<tr>
<td>13 % of total population who are food insecure</td>
<td>MINAGRI</td>
</tr>
<tr>
<td>14 Incidences of deaths, illnesses or loss/destruction of property due to floods, landslides or drought</td>
<td>MININTERE (Disaster Coordination Unit)</td>
</tr>
<tr>
<td>15 Incidences of malnutrition among under-five year olds</td>
<td>MOH</td>
</tr>
<tr>
<td>16 Infant mortality rate</td>
<td>MOH</td>
</tr>
<tr>
<td>17 Under 5 mortality rate</td>
<td>MOH</td>
</tr>
<tr>
<td>19 % of forestry cover in the country</td>
<td>NAFA</td>
</tr>
<tr>
<td>20 Soil loss( in t/ha/year)</td>
<td>NLC, MINAGRI</td>
</tr>
<tr>
<td>21 Area protected against soil erosion</td>
<td>MINIRENA</td>
</tr>
<tr>
<td>22 Water availability</td>
<td>MINIRENA</td>
</tr>
<tr>
<td>Natural resources and Environment</td>
<td>Agriculture and Livestock</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>1. Proportion of population with sustainable access to adequate sanitation</td>
<td>MINIRE NA</td>
</tr>
<tr>
<td>2. % of households with access to adequate sanitation facilities</td>
<td>MINIRE NA</td>
</tr>
<tr>
<td>3. % of households with sustainable use of water for production</td>
<td>MINIRE NA</td>
</tr>
<tr>
<td>4. % of total population who are susceptible or exposed to the risk of floods, landslides or drought</td>
<td>MINIRE NA</td>
</tr>
<tr>
<td>5. % of the public/private programmes providing biodegradable alternatives to banned items</td>
<td>MINIRE NA</td>
</tr>
</tbody>
</table>
### Matrix 2: Sector Level Poverty-Environment Indicators

<table>
<thead>
<tr>
<th>Sector</th>
<th>Indicator</th>
<th>MINIRE</th>
<th>MINAGRI</th>
<th>MININFRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Quantity of annual household consumption that is derived from forest products</td>
<td>NA</td>
<td>MINAGRI</td>
<td>MININFRA</td>
</tr>
<tr>
<td>7.</td>
<td>Area of land protected to maintain biological diversity</td>
<td>MINIRE NA</td>
<td>MINAGRI</td>
<td>MININFRA</td>
</tr>
<tr>
<td>8.</td>
<td>Percentage of the poor living on marginal land such as fragile highland areas</td>
<td>REMA</td>
<td>RADA</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>% of rural households with secure land tenure</td>
<td>MINIRE NA</td>
<td>RADA</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Decrease the emission of greenhouse gases in the atmosphere (CO₂, CH₄, NO₂)</td>
<td>MINIRE NA</td>
<td>RADA</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Rwanda land use per household per hectare</td>
<td>NLC</td>
<td>MINAGRI</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- MINIRE: Ministry of Rural Development and Environment
- MINAGRI: Ministry of Agriculture and Animal Resources
- MININFRA: Ministry of Infrastructures
- REMA: Rural Economic Management Agency
- RADA: Rural Development and Agricultural Agency
- NLC: National Land Use Committee
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12. % of hilly areas which have been terraced or under soil conservation</td>
<td>MINAGRI</td>
<td>12. % of km of rainwater drainage increased in urban area</td>
<td>MININFRA</td>
</tr>
<tr>
<td>12. Proportion of total land area under forest &amp; tree cover employing the poor</td>
<td>NCL</td>
<td>13. % of households using Inorganic mineral fertilizer</td>
<td>RADA</td>
</tr>
<tr>
<td>13 % decrease in the consumption of firewood through the use of improved cook stoves</td>
<td>RADA</td>
<td>13. % of households &amp; industries using fuel wood as a source of energy for cooking</td>
<td>MININFRA</td>
</tr>
<tr>
<td>14. Percentage of households using more efficient wood-based technologies for energy</td>
<td>NAFA</td>
<td>14. % of farm households using Organic fertilizers</td>
<td>RADA</td>
</tr>
<tr>
<td>15. % of irrigation &amp; other water-intensive projects that have been subjected to environmental impact assessment</td>
<td>NAFA</td>
<td>16. % of rural water supply systems functional at the time of spot checks in rural and urban areas</td>
<td>MININFRA</td>
</tr>
<tr>
<td>161. % of existing land rights secured through land tenure regularization for effective land administration and land use management</td>
<td>MINIRE</td>
<td>17. % of people living in slum areas</td>
<td>NA</td>
</tr>
<tr>
<td>17. % of non-agricultural land protected against soil erosion</td>
<td>MINIRE</td>
<td>18. % of population using hygienic and sanitation facilities</td>
<td>MININFRA</td>
</tr>
</tbody>
</table>
## Matrix 2: Sector Level Poverty-Environment Indicators

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Data Source 1</th>
<th>Data Source 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.</td>
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<td>68. % of rural households accessing credit from financial instruments using land as collateral</td>
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<td>69. Invasive non-native species that are threatening to ecosystems, habitats, or species</td>
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Matrix 3: District Level Poverty- Environment Indicators

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<th>Name of Indicators</th>
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<tr>
<td>1. No. of trainings in community based natural resources management</td>
<td>Districts</td>
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<tr>
<td>2. No. of Water User Committees (WUCs) formed</td>
<td>Districts</td>
</tr>
<tr>
<td>3. % of WUCs with O&amp;M budget</td>
<td>Districts</td>
</tr>
<tr>
<td>4. % of WUCs headed by women</td>
<td>Districts</td>
</tr>
<tr>
<td>5. % of HAMS in schools and PHAST in midugudu actively functioning</td>
<td>Districts</td>
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<tr>
<td>6. Municipal &amp; solid waste management plans</td>
<td>Districts</td>
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<tr>
<td>7. No. of grouped settlements (midugudu) sites evaluated for environmental suitability</td>
<td>Districts</td>
</tr>
<tr>
<td>8. % of forests managed through collaborative arrangements with local communities</td>
<td>Districts</td>
</tr>
<tr>
<td>9. Frequency of solid waste transportation in areas occupied by the poor</td>
<td>Districts</td>
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<tr>
<td>10. Percent of residents using traditional fuels</td>
<td>Districts</td>
</tr>
<tr>
<td>11. Incidences of water-use conflicts</td>
<td>Districts</td>
</tr>
<tr>
<td>12. Radical and progressive terraces (ha)</td>
<td>Districts</td>
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<td>15. % of districts which have formulated &amp; are implementing anti-erosion regulations &amp; byelaws</td>
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<td>12. % of hilly areas which have been terraced or under soil conservation</td>
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<td>12. Proportion of total land area under forest &amp; tree cover employing the poor</td>
<td>NCL</td>
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<tr>
<td>13 % decrease in the consumption of firewood through the use of improved cook stoves</td>
<td>13. % of households &amp; industries using fuel wood as a source of energy for cooking</td>
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<td>14. Percentage of households using more efficient wood-based technologies for energy</td>
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<tr>
<td>15. % of irrigation &amp; other water-intensive projects that have been subjected to environmental impact assessment</td>
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<td>17. % of non-agricultural land protected against soil erosion</td>
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<td>18. % of population using hygienic and sanitation facilities</td>
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<td><strong>67. Existence of operational land registration services at district &amp; sector level</strong></td>
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<td><strong>68. Sensitization meetings held on land tenure (annually)</strong></td>
<td>MINIRENA</td>
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<td><strong>69. % of rural households accessing credit from financial instruments using land as collateral</strong></td>
<td>MINIRENA</td>
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<td><strong>69. Invasive non-native species that are threatening to ecosystems, habitats, or species</strong></td>
<td>MINIRENA</td>
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### Matrix 3: District Level Poverty-Environment Indicators

<table>
<thead>
<tr>
<th>Name of Indicators</th>
<th>Institution responsible</th>
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</thead>
<tbody>
<tr>
<td>1. No. of trainings in community based natural resources management</td>
<td>Districts</td>
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<tr>
<td>2. No. of Water User Committees (WUCs) formed</td>
<td>Districts</td>
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<tr>
<td>3. % of WUCs with O&amp;M budget</td>
<td>Districts</td>
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<tr>
<td>4. % of WUCs headed by women</td>
<td>Districts</td>
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<tr>
<td>5. % of HAMS in schools and PHAST in midugudu actively functioning</td>
<td>Districts</td>
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<td>6. Municipal &amp; solid waste management plans</td>
<td>Districts</td>
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<tr>
<td>7. No. of grouped settlements (midugudu) sites evaluated for environmental suitability</td>
<td>Districts</td>
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<td>8. % of forests managed through collaborative arrangements with local communities</td>
<td>Districts</td>
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<td>9. Frequency of solid waste transportation in areas occupied by the poor</td>
<td>Districts</td>
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<td>10. Percent of residents using traditional fuels</td>
<td>Districts</td>
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<tr>
<td>11. Incidences of water-use conflicts</td>
<td>Districts</td>
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<td>12. Radical and progressive terraces (ha)</td>
<td>Districts</td>
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<tr>
<td>13. Local leaders trained in land dispute resolution</td>
<td>Districts</td>
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<tr>
<td>14. Local leaders trained in land dispute resolution</td>
<td>Districts</td>
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<tr>
<td>15. % of districts which have formulated &amp; are implementing anti-erosion regulations &amp; byelaws</td>
<td>Districts</td>
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</table>
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**List of experts interviewed**

1. Alex Mulisa: Consultant, REMA
2. David Bakora: In charge land use planning, NLC
3. Didier: Director, NLC
4. Emanuel: Planning officer, MINAGRI
5. Esperance Nyirabwiza: In charge Planning
6. Fabrice Mugabo: Coordinator, Africa Environment information Network (AEIN), REMA
7. Fiona Gatere: Consultant, MIS/M&E, MINAGRI(PAPSTA)
8. Innocent Musabwimana: Planning officer, MINIRENA
9. Joseph Nvurirwenande: In charge statistics, MININFRA
10. Kabera Emanuel: Project management officer, REMA
11. Karangwa viatere: Assistant M&E officer, MINAGRI
12. Musoni Felly: M&E officer, MINAGRI
13. Musoni Emanuel: In charge M&E, MININFRA
14. Myambi Celestin: Project officer, REMA
15. Nyamarere J. Claude: Planning officer, NAFA
16. Orestte Munyurangabo: Infrastructure Karongi District
17. Veneranda Ingabire: Expert statistics for Karongi Pilot Data collection, In charge of Data entry