Government of Namibia
Ministry of Environment & Tourism

Namibia's Country Pilot Partnership for Integrated Sustainable Land Management (CPP NAM ISLM)

A Strategic report on the situational analysis and the way forward for an integrated and systematic environmental monitoring and reporting system

CPP
Country Pilot
Partnership
NAMIBIA

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List of Abbreviations and Acronyms

AHP	Analytical Hierarchy Process
AMESD	African Monitoring of the Environment and Sustainable Development
CBS	Central Bureau of Statistics
CPP	Country Pilot Partnership
CPP-ISLM	Country Pilot Partnership for Integrated Sustainable Land Management
DEA	Directorate of Environmental Affairs
EEIS	Environmental Education and Information Systems (Unit)
EIS	Environmental Information Services
EMIN	Environmental Monitoring and Indicator Network
GIS	Geographic Information Systems
IA	Integrated Assessment
IEM	Integrated Environmental Management
ISoER	Integrated State of Environmental Reporting
LDMS	Land Degradation Monitoring System
MET	Ministry of Environment and Tourism
NCEI	National Core set of Environmental Indicators
NGOs	Non-Governmental Organizations
NSDI	Namibia's Spatial Data Infrastructure
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
SoE	State of Environment
SoER	State of Environmental Reporting
SWOT	Strengths, Weaknesses, Opportunities and Threats

1.   Introduction

The CPP Programme aims to put in place effective monitoring and evaluation systems for adaptive management at local and national levels. A detailed Land Degradation Surveillance System was developed which tracks the type and extent of land degradation across Namibia over time. The challenge that remains is to create a coordinated system that is relevant to the specific local context i.e. through indicators chosen by the resource users themselves, which can be directly applied by communities but are also sufficiently scientifically credible and rigorous to be useful for higher level evaluations.

Under previous initiatives, Environmental Monitoring and Indicator's Network (EMIN) was established by the Ministry of Environment and Tourism (MET) to provide an integrated monitoring and reporting system on strategic environmental issues and concerns in Namibia. Its membership comprised of various stakeholders concerned with the multidisciplinary approach to environmental management, sustainable utilization and conservation representing different line Ministries, non-governmental organizations (NGOs), academic institutions, and other organizations. EMIN has not been active for a number of years now and this has become a bottleneck to an integrated and systematic monitoring, reporting and early warning on pertinent environmental issues.
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It is for this reason that CPP in partnership MET has been deliberating on various strategies to revitalize and strengthen EMIN. At the March 2010 EMIN consultative meeting, a resolution was taken for a thorough scoping of the work, content and information products of existing environmental and related initiatives which have either sustained or developed in the meantime. The ultimate product of this assignment is a situational analysis and a comprehensive strategy for an integrated environmental management system for environmental monitoring and reporting process.

2.   Background to environmental monitoring and reporting

2.1.   Introduction

State of the environment reporting (SoER) has been largely the preserve of government, through MET's mandated to undertake environmental assessment and to report to government and for public information. Traditional state of the environment (SoE) reporting has the objective of providing information on the thematic environmental issues and has been useful to point out environmental trends and conditions of its key variables. It is mainly concerned about the biophysical environment and less about the human dimension except in the context of the pressures humanity exerts on the environment. SoER analysis, however, needs to be integrated with the assessment of key driving forces and policies that cause or influence the environmental trends that have been identified. Thus, although SoER analysis substantiates claims about environmental conditions, policy assessment points out the key leverage to decision-makers.

With the emergence of the concept of sustainable development – whose three main pillars are social, economic and environment – environmental practitioners responded with the introduction of integrated state of environmental reporting (ISoER), which integrates social, economic and environmental issues in the SoE analyses. In Namibia the first ISoER was released in 2007 although the process started as early as 2001 (Nakanuku *et al.* 2001). ISoER tries to show the cause-effect linkages of human and natural action on the environment, and in turn, the resultant environmental change in the state of the environment and human well-being. It means that the end result of ISoER should be more than just knowing the state of the environment. It should give policymakers and other stakeholders some guidance on how to better manage the environment. In order to achieve this, information obtained from such reports should be integrated with other social and economic data and information to assist in policy formulation for the environment. The growing interest in linking environmental, social and economic data and information within the context of sustainable development facilitates integrated analysis of the complex interactions between people and their environment. It is also essential to consider leverages required on policies to promote sustainable development. This is the concept of integrated environmental management for environmental assessment, monitoring and reporting, and it introduces new challenges to the whole process:

- It implies an acknowledgement of the environment and human interactions and the impacts they have on each other over time.
- It incorporates environmental assessment and reporting into the whole process of environmental policy planning, pulling together the impact of policies from different sectors over

time and the existing opportunities to promote sustainable livelihoods and options.

- It gives us an inventory of available resources which can be used as a starting opportunity for working towards sustainable development.

- It requires the development of appropriate measures to assess existing and changing pressures and opportunities in the environment, and achievements in reducing or containing these pressures and increasing available opportunities in a progressive movement towards sustainable development.

Integrated environmental management in the broader scope of assessment, monitoring and reporting encourages all stakeholders to constantly ask whether enough is being done in: looking out for and utilizing opportunities currently available in environmental resources, achieving sustainable development, reducing poverty, conserving and improving the state of the environment.

2.2. Environmental Monitoring and indicator Network (EMIN)

The section is to document the experiences and approaches used by the Environmental Monitoring and indicator Network (EMIN). This involves both successful and less successful aspects of this process. It aims to help in the current effort by ensuring that mistakes are not repeated, to reduce cost and to improve professional practice and efficiency.

The section is partly guided by the author's organisational memory and experience, as well as by publications and other products emanating from activities of EMIN. Visits to different organisations were also made to appreciate their consent on EMIN.

In 2001, a broad coalition of stakeholders under the leadership of MET instigated EMIN and formally launched it as a partnership network with a vision that the availability and use of information about the environment could help improve the manner in which it was managed. The vision was inspired by the rapid spread of information technology, in particular geo-information management technologies such as Geographic Information System (GIS), remote sensing and Global positioning System (GPS). It was also catalyzed by growing concerns about the quality, systematic integration and sustainability of environmental monitoring activities in Namibia, mainly the then so much desired ISoER. EMIN was placed under the custodianship of the (then) Environmental Information Services (EIS) Unit[1] of MET, and its activities were funded directly under EIS through a bilateral cooperation agreement between the Governments of the Republic of Namibia and the Republic of Finland.

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[1] Present day Environmental Education and Information Services (EEIS)

Important aspects of sustainability of EMIN and the national frameworks for ISoER were discussed during EMIN I and were seen best left as responsibilities of MET (Nakanuku *et al*. 2001). Unfortunately, there was no budget available for EMIN after the official closing of the bilateral cooperation, although according to Nakanuku *et al*. (2001) all activities of EIS, including the functioning and coordination of EMIN were to be taken over by MET after the end of the bilateral agreement cooperation.

Since its inception, three consecutive EMIN workshops were held from 2001 until 2003. Workshop proceedings have been published and well distributed. EMIN I (2001) identified ten top pressing environmental issues in the country (Figure 1), and on this basis, four (4) working groups were formed to guide the development of the National Core set of Environmental Indicators (NCEI) to feed directly into the ISoER. Through EMIN, thematic monitoring programmes in various organisations adopted the NCEI, although it was possible to include other indicators deemed important at a thematic scale (Noongo *et al*. 2002). The four working groups operated on ad-hoc basis with no written mandates or formalized membership. It is not clear how long these groups lived although by mid-2004 all of them had dissolved and no effort was made to revive them. Instead, EIS kept productive but informal consultations with individuals from all working groups.
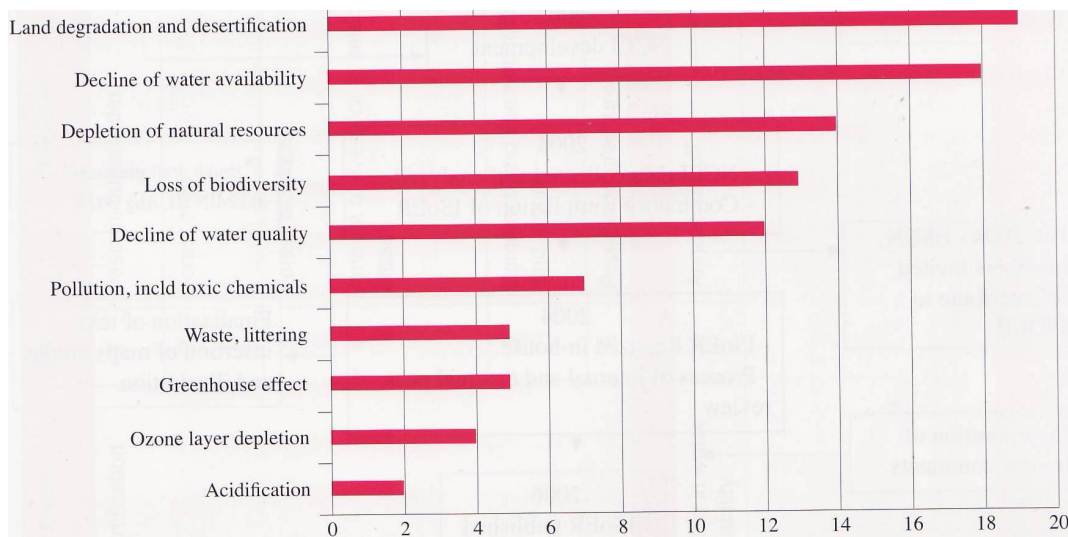
Figure 1: Namibia's top ten environmental issues in order of least importance, from bottom to top
(Nakanuku *et al.* 2001)

Launched in 2001, by 2002, EMIN had become a well recognized platform conducive to discussing and reporting on indicators and their monitoring. Further, EMIN encouraged data sharing and for this reason initiated the compilation of a spatial data sharing policy in 2002. In 2004, EMIN became inactive due to capacity challenges within the EIS unit, and a lack of committed financial resources.

In absence of EMIN, a number of new initiatives have been formed with objectives of varying correspondence to those of EMIN. While there is a wealth of environmental monitoring and data dissemination initiatives, there is presently no roadmap for an integrated environmental assessment, monitoring and reporting in Namibia. This situation hinders efforts of national integrated monitoring and early warning systems.

Table 1 is a SWOT analysis of EMIN, performed in view to point out key elements that need consideration for inclusion in the IEM strategy and to help in the current effort by ensuring that mistakes are not repeated, to reduce cost and to improve professional practice and efficiency.

Table 1: EMIN through SWOT analysis

Strengths	Opportunities
- Lead ministry identified a national stakeholder's forum established. - A diversity of professionals from various sectors and technical background that can contribute to environmental assessment, monitoring and reporting. - Expanded involvement of the private sector in the environmental and information management industry. - Supported educational facilities and programmes. - Enhanced institutional and human capacity, information collection, documentation, dissemination and retrieval. - Promoted integrated research and development in information handling, information norms and standards, library science, documentation, archives and records management - Supported comprehensive and effective training programmes for personnel involved in environmental assessment, monitoring and reporting, information systems and services. - Evolved mechanisms for environmental monitoring, evaluation and reporting. - Community awareness.	- Policies support. - Training opportunities. - Access to advanced science and technology for integrated environmental assessment and information gathering, analysis and dissemination. - Mobilization of sufficient funding to support the network and its activities. - Leverage with other initiatives of environmental monitoring and evaluation in the country. - Ability to mobilize its membership to raise resources (financial/technical) towards a given project/programme.
Weaknesses	**Threats**
- No clear strategic direction. - Apathy on the roles and mandates of working groups. - Lack of dedicated membership base. - Dependence on donor funding. - Weak institutional arrangements. - Lack of coordination between various stakeholders and line ministries.	- Donor fatigue and inadequate capital. - Political interference in its management. - Sustainability

2.3.   Development of Namibia's Integrated State of Environmental Report

Activities of EMIN led to the development of Namibia's first ISoER entitled *Vital Signs of Namibia 2004*. The ISoER was produced by MET but its compilation required close collaboration with various EMIN stakeholders. Through EMIN, the process of environmental assessment and reporting involved a number of institutions working together to achieve common goals of particular relevance, including:

-   Coordination mechanism
-   Handling of environmental data
-   Discussion and resolution of technical problem

The ISoER is wholly based on NCEIs developed through EMIN (MET, 2007). The NCEIs were prioritized by EMIN members in a plenary session. The Analytical Hierarchy Process (AHP), which is the most widely used multi-criteria analysis method of analysis, was used to select indicators. The AHP converts subjective assessment into a set of weights where pair-wise comparisons are made between criteria and indicators. The criterion for the initial selection of an indicator was data availability followed by relevance, scientific credibility and responsiveness.

Figure 2 is a representation of the whole developmental process of the ISoER. As can be seen, the publication text was ready by 2004 but final editing and printing was only possible in 2006/7. Reason for this was lack committed financial recourses for EMIN activities and products thereof. The final editing and printing was possible with financial aid from the German Government through the German Agency for Technical Cooperation (GTZ).
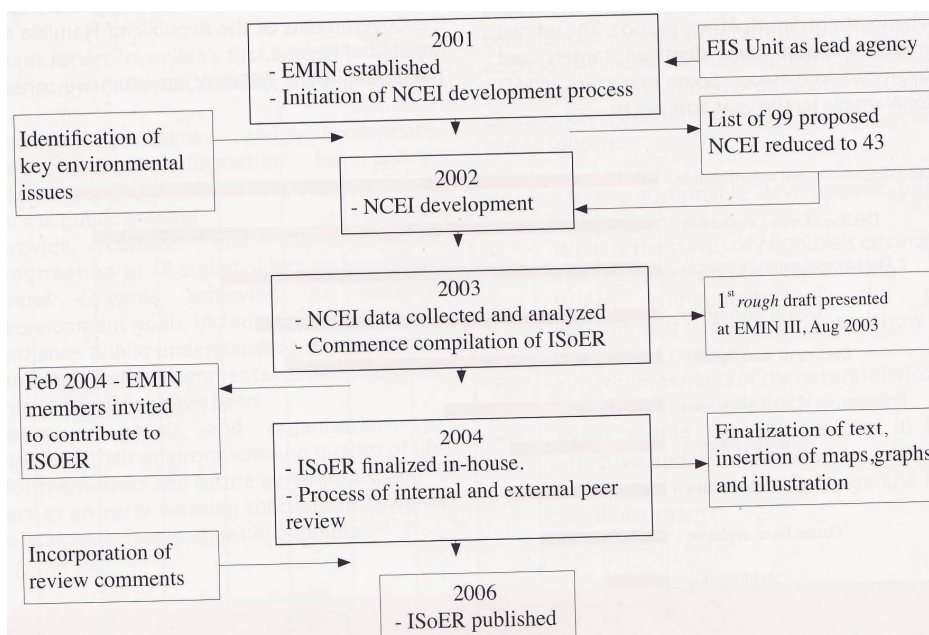
Figure 2: Development process toward the publication of the ISoER (MET, 2006)

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2.4. Key issues and lessons learned

Experiences from EMIN and throughout the process of ISoER suggest that various issues have to be addressed carefully in order to safeguard the working environmental and in a broader sense sustainability interests. These issues are related to content, procedure and process aspects. This section discusses these key issues and related lessons learned.

2.4.1. Time, flexibility and duration

The issue of time, flexibility and duration refers to procedures (for planning content), process (of interaction with stakeholders) as well as to the content of final products. Early involvement of partnerships e.g. at the planning stage of an assessment, monitoring and reporting process leaves room for innovation, but will involve risks in the process. Late involvement results in less room for innovation but also results in a less complex process with less risk. If stakeholders are involved earlier, periods will preferably become longer to warrant quality products. The challenge is to create partnerships and stakeholder forums that are adaptive to future (unforeseen) developments.

2.4.2. Roles, responsibilities and relationships of different parties

The roles, responsibilities and relationships of the various parties might change due to new partnerships and/or stakeholder platform involvement. The role of the lead agency and that of the core team (usually a government department) is normally that of coordination. So, government may have to step back from technical aspects and focus more on its role of safeguarding the quality of the process and of the end products. The weak link in this is that the core team does not benefit in capacity building and are left unable to repeat the process on their selves. The challenge is to institutional and organisational arrangements with sufficient checks and balances that use the strength of other stakeholder to benefit and capacitate others were necessary and possible. The arrangements should allow for sufficient flexibility while safeguarding weak and long-term interests.

2.4.3. Participation and transparency of process

Public participation is an essential condition. Third parties, environmental organisations and other stakeholders hold their legal rights because procedures, policies and regulations. The need for ongoing public involvement in monitoring and reporting processes is essential and yields informed results.

3. Managing an Integrated Assessment, Monitoring and Reporting Process

Integrated environmental assessment, monitoring and reporting should be looked at as a continuous process. Its organization and management must be carefully planned to allow scientists in various fields of environmental pursuits to choose the important issues for analysis in collaboration with a broad but manageable range of civil society members.

3.1. Importance of the process

Environmental assessment, monitoring and reporting process is important first and foremost because it is in itself a learning process. With a wide range of stakeholders involved from different sectors of society to influence decision making, it becomes a capacity-building process encouraging stakeholders, both individuals and institutions, to learn about the process of sustainable development and environmental protection. Through interaction to develop and produce an assessment report or a monitoring system, more and more people learn about how they can work together for the greater good. Interaction is also critical since individuals representing different disciplines, organizations, or, more broadly, different social interests may also have different though equally legitimate views on the environment and economy. This is important in all situations but is particularly important in places like Namibia where expertise and financial resources are limited. The interest in sustainable development spreads from individual sectors or ministries, to a set of stakeholders in all sectors providing a much broader base for:

- Supporting sustainable development by identifying economic, social and environmental linkages and the synergies among them. We need to first know what is happening to the environment to answer why it is happening. And we need to have a clear idea about the driving forces and root causes to talk about what we can do better or the potential consequences of inaction.

- Exploring linkages between a particular policy, the economy, society and the environment. Through a learning process, assumptions and expectations are clearly identified through the participation of a large number of stakeholders, and decision-makers will learn how to build support for their goals. Participation and cooperation of diverse interest groups throughout the reporting process are essential.

- Developing appropriate monitoring and evaluation systems. Often, a country or a region may have a specific theme as the focus of its sustainable development effort and may need a set of related monitoring and evaluation systems to achieve this theme.

- Encouraging good governance and ownership of the process. The output (e.g. report, model, system) produced using integrating approach is very important as a final document. However, the process of its production is just as important particularly in making those who produce it feel a sense of ownership of the report. The involvement of a wide range of government departments on one hand, and the private sector, industry, academia, local communities and other domestic interest groups helps to ensure that a wide range of views are considered. It also increases transparency and accountability in decision making, and helps to build consensus and to strengthen national capacities through doing. Widespread participation in the process and good governance increase the chances that the output will be taken seriously by both the public and the decision-makers.

- Bringing together the fragmented knowledge. Integrated monitoring and reporting requires bringing together information and insight that usually lay scattered across a variety of disciplines and organizations. Thus it also requires bringing together organizations and people that may not have a history of collaboration. The potential for tension along professional, bureaucratic or political lines is considerable. Trust, confidence and cooperation both between organizations and key individuals are key for success, but they can only occur over time and need facilitating.

IEM requires not only a framework, but also a strategy to help keep the analytic process together. The method most appropriate for this purpose is integrated assessment (IA). IA is an interdisciplinary and participatory process that combines, interprets and communicates knowledge from different scientific disciplines to allow a better understanding of complex phenomena (Rotmans, van Asselt and de Vries, 1997). In more detail, the steps of an IA are as follows:
- *Combining and linking* pieces of knowledge from a variety of disciplines, such as ecology, economics, geography, sociology, and so on.
- *Interpreting* viewpoints of various stakeholders, possibly including governments, non-governmental organizations, corporations and universities.
- *Communicating* knowledge to a broad audience.

3.2.   Who should manage the process and who should be involved?

These are critical questions that need to be answered early in the planning and implementation process. The organizational structure to be set up will work throughout the entire continuous process, but can be revised when deemed necessary. It is important that all involved organizations and individuals understand the need for long-term commitment.

The training manual on Integrated Environmental assessment and Reporting in Africa (2006) emphasises that there is no model in the management of environmental assessment and reporting process in Africa. But in the more successful programmes in Ghana and Uganda are good examples. A department, directorate, agency or authority in a relevant ministry champions the process.

IEM can also be viewed as a tool to aid communication between science and policy. This role is particularly important because institutionalized process can provide a network for continuing dialogue between these two fields and stakeholders, as well as society in general. To bring science and policy together, a participatory process is necessary. While participation needs to be representative; it is not practical that all sectors of society will participate to the same degree. For practical purposes the number of participants in assessment and reporting needs to be limited to keep the process manageable.

The Capacity Building for Integrated Environmental Assessment and Reporting – Training Manual (1999) and the training manual on Integrated Environmental assessment and Reporting in Africa (2006) lists four major levels of involvement in the assessment, monitoring and reporting process:

- Specialized working groups of experts, (e.g. on policy, capacity-building, data, etc.), collaborating agencies and other special interest institutions, participate in identifying key issues of concern in the various areas of their interest, in line with the various environmental initiatives in the country.

- Thematic groups (e.g. on the marine environment) and youth are consulted on issues of interest to them.

- Consultation: this is a higher level of involvement under which, at some point before the final output is finalized, opinions of stakeholders are solicited. That point is where both the specialized working groups and the thematic groups are called together for discussion. Those finalizing the outputs are expected to take into consideration the comments and advice that they get from the stakeholders that they consult.

  The broad involvement encourages scientists, policymakers and civil society to engage in assessment, monitoring and reporting discussions and debates, which is the very basis of an IEM. A network of academics for capacity-building in environmental assessment is also crucial.

  A range of other potential stakeholders to be involved can include: civil society, businesses, NGOs, media, religious organizations, trade unions, youth groups, indigenous peoples' groups, political party representatives, and unaffiliated citizens.

- Information dissemination: this is a fairly low level of involvement. Here, the public is informed of the products either about to be made or already made on the environment. They may comment and their comments may be listened to but may not influence the final outcome of the product.

3.3. Legal mandate

Environmental assessment, monitoring and reporting are complex tasks, and they will not produce the expected results unless the capacity to perform them adequately is permanently maintained. This requires that the mandates and capacities to carry out this task are considered as part of the core infrastructure of social organizations, a responsibility often of government. Moreover, each of the components participating in the process should have authorization to carry out what is expected of it. It should also have authority to demand what is expected of others for it to be able to carry out its responsibilities.

Legislation at the national level must be included in any environmental policy at all levels of monitoring and reporting. Legislation could also cover the extent of collaboration between government agencies that can contribute to the assessment, monitoring and reporting process. Sometimes, it may be fitting for the legislation to establish a special partnership among the national statistical authority, national environmental monitoring programs, and the reporting agency. Similarly, it would be appropriate for the legislation to discuss environmental monitoring and reporting among various levels of government. A national reporting agency, for example, could play a catalytic and supporting role in developing reporting at regional and local levels. In addition, the legislation could be used to encourage data sharing and harmonization of monitoirng initiatives. Finally, the legislation can set the stage for external consultation and participation, including the use of advisory bodies.

3.4. Communications strategies for assessment, monitoring and reporting

Without adequate communications, monitoring products have little or no impact, and may become yet another important product that gets filed for future reading or familiarization. Also, reports loaded with technical jargon and non-user friendly systems can be intimidating to the non-scientist or non-technical. Major messages about critical trends and policy options are often scattered through the text.

IEM need communications strategies and plans that make the highlights readily available and understandable to key audiences, a diverse group with different needs and levels of understanding of environmental issues. The people who create environment products do not have to be communications experts, but they should be able to make strategic communications decisions and guide the communications experts who prepare and deliver messages. Communications must be a part of strategic

planning if an IEM is to successfully communicate its messages. Communications is a process with its own rules and procedures.

Note the differences between the traditional and flexible communication models in Table 2. For our purposes, the flexible model is probably more useful.

Table 2: Communication planning in a traditional and flexible model (Pinter *et al.* 1999)

Traditional Model	Creating a Flexible Strategy
- Management and experts decide there is an issue.	- Management and experts decide there is an issue.
- Determine position and performance.	- Build a communications plan.
- Select the audiences.	- Create an advisory group: multi-stakeholder, collaborative, solution seeking.
- Decide what people should know.	- Set long-term goals. Refine goals.
- Select key concepts, messages and decide on form and content.	- Identify stakeholders and audiences.
- Prepare the messages.	- Determine their knowledge, beliefs, opinions, where they get information and who they trust.
- Produce materials that reflect their opinion.	- Research what communications is being done by various parties now.
- Publish, disseminate, train and lobby.	- Develop first message, based on research. Build on existing credible messages.
- Determine success without formal evaluation.	- Pre-test message. Does it make sense? Train communicators in workshops.
	- Deliver messages. Help others to deliver compatible messages.
	- Consult, survey and determine effectiveness of messages. (This testing process establishes a feedback loop).
	- Refine message, based on feedback. Modify messages.
	- Develop other messages as necessary. Retrain communicators as necessary.
	- Advise others on their messages.
	- Continue to deliver and modify messages over time.

4.   Situational analysis

4.1.   Approach and methodology

The purpose of this situational analysis is to determine the existing situation and document the baseline conditions at the time of the study. This information will then enable the project team to make informed strategic recommendations for IEM for environmental monitoring and reporting processes. The analysis followed two approaches; i) literature review and ii) structured interviews. Each approach is elaborated below.

4.1.1. Literature review

This entailed the review of relevant literature on various initiatives carrying out environmental monitoring, developing indicators, collecting environmental data and information or contributing in one way or another towards environmental assessment, monitoring and reporting. The following list provides some of the key literary sources that were reviewed (proper referencing attached);

- EMIN I, II, and III proceedings
- Integrated State of Environmental Report "Namibia's Vital signs 2004"
- Third National Development Plan (NDP3) of Namibia
- Working document on National Spatial Data Infrastructure Policy of 2009
- Land Degradation Monitoring System (LDMS) for Namibia: A report on the processes and activities toward establishing the LDMS, 2009
- MET's Strategic Plan for the period 2007/08 to 2011/12 (Strategic Theme 6: Policy, Planning, Knowledge Management and Communication)
- Environmental Management Act, 2007
- Training manual on Integrated Environmental assessment and Reporting in Africa (2006)
- The Capacity Building for Integrated Environmental Assessment and Reporting – Training Manual (1999)

The objective of the literature review was to draw on historic and current development of integrated environmental management efforts, best practices and lessons learned to adequately inform the process of the proposed strategy of this report. Given that the duration and scope of the assignment do not allow for wider consultation at national level, the literature review proved vastly useful to obtain current relevant

information. The interviews aided in contextualising concepts, challenges and opportunities to ensure the proposed strategy (section 5).

4.1.2. Structured interviews

The interviews were structured in a way to identify active thematic initiatives on environmental management and information services, to assess their work in terms of content and information products, identify similarities and differences with the mandate and operations of EMIN, and identify on-going and planned related monitoring systems in Namibia at national and local levels.

The interviews were planned and designed to scope out the situation by doing a limited number of interviews and, to compare preliminary outcomes from the interviews with literature. The questionnaire methods of interview were based on email, physical and telephonic interview. The email method yielded high result as compared to physical (i.e. office visiting) interview. This is because many interviewees preferred completing the questionnaire on their own time and emailing it back. Telephone interviews were made also, that includes follow-up calls to most targeted respondents and those that have shown resistance in completing the questionnaire. A very limited number of interviewees asked for clarity on the questionnaire, which indicated that the content of the questionnaire was clear and understood.

Ten (10) initiatives were identified and responded successfully to the questionnaire. They however whined about the short time period given for completing the questionnaire (one week only). Other reasons for whining included:
- Waste of time completing the questionnaire because the same project has been discussed with the MET without any implementation, and
- Other private companies are doing the same project with success facts.

The data from the interviews were entered into MS Excel for analysis. To analyse and use the narrative answers, the main messages related to key issues identified in this section were extracted and rated based on the number of respondents with similar answers. Results from the analysis are presented as pie charts and tables.

See the questionnaire attached to this report as Annex 1 and a list of stakeholders/ institutions interviewed/ who completed the questionnaire as Annex 2.

4.2. Results and discussion

4.2.1. The nature of existing initiatives

One of the important aspects of the situational analysis is understanding the nature of existing initiatives with regard to environmental management aspects. The questionnaire results in figure 3 revealed that close to 50% of considered initiatives are best described as environmental information and management systems/services, and another 46% are either monitoring systems or thematic working groups.
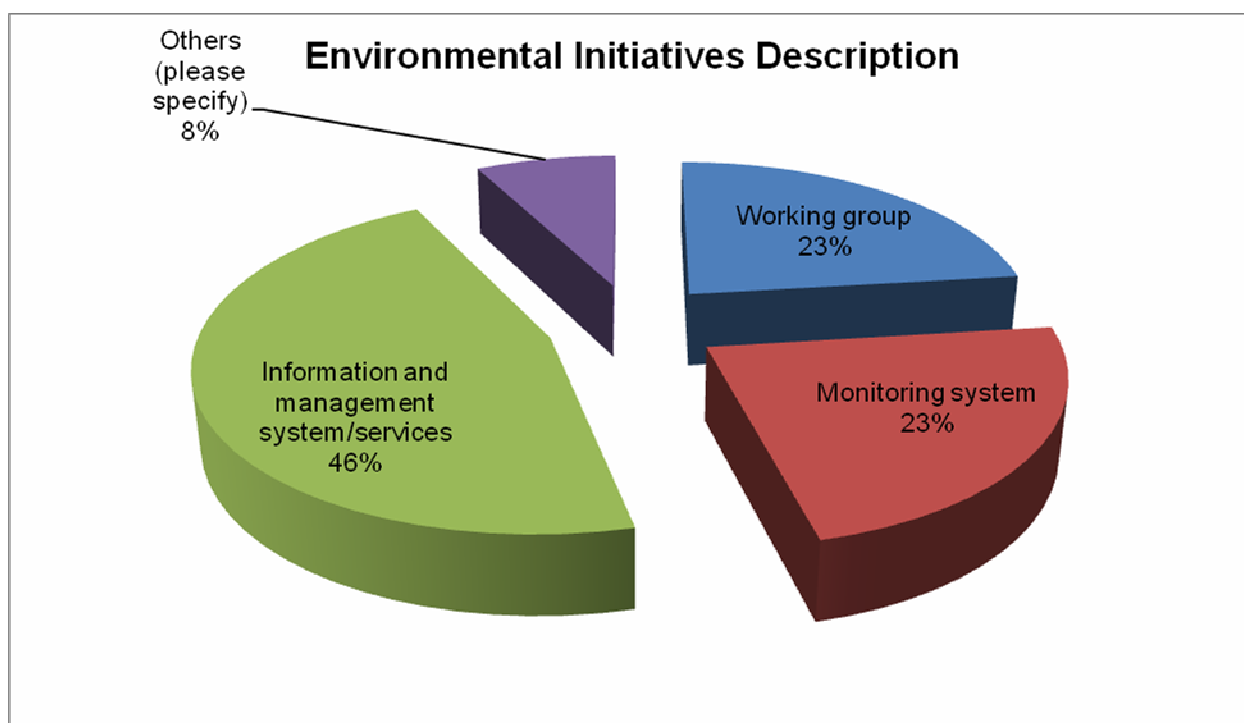
Figure 3: Categories of current environmental initiatives in Namibia

4.2.2. Initiatives' focus and objectives

Table 3 is the focuses and objectives of the various environmental initiatives, indicating the diversity of these initiates. Technical staffs involved in these initiatives are not necessarily unaware of the other initiatives, but rather there is a lack of integration, collaboration and coordination between the initiatives. Each initiative is trying to develop new instruments even on areas where clear overlap of interest between initiatives exist. Particularly, it appears that government and private sector operates in different cocoons. This is perhaps based on the historical trend where the environment and development sector has treated environmental management as a process in which government and private parties have opposing

interests. This "arms-length" in not beneficial to either of the parties, rather an open cooperation is desired. This can result in inefficiencies and missed opportunities for sharing knowledge and experiences for better alignment of effort and resources, and for establishing partnerships. There is thus a need for an avenue for integration of activities across initiatives. A methodology and action plan for implementing this process would be the major output of the proposed strategy. This would minimize duplication of effort in achieving common objectives. MET's EEIS unit which is responsible for ISoER has not been engaged in any of the external initiatives.

All government agencies have differing functions which they are required to carry out in accordance with a range of legislation, the objectives of which can at times overlap across line ministries or even across departments of the same ministry. Unless a more coordinated and aligned "whole of sector" approach is taken, this can lead to conflicting messages from and between departments, ministries and agencies in relation to environmental management and resource use and development.

The list of initiatives highlighted in the table is not comprehensive but is a good indicator of the multiplicity of efforts that are trying to create skills in the management of environmental information and the awareness of their relevance to sustainable development. While technical and technological issues are easily addressed, organizational issues are not. There are two challenges that relate to organizational issues:

- The multiplicity of sources of information that require standardizing to facilitate cooperation among the people involved in the disparate projects in this field.

  For the purpose of IEM, adjustments are required in the data collected and used by individual workgroups, to obtain overall assessments of the state of the environment. This problem links into a national concern for standardized data collection that can be used for multiple purposes. The Central Bureau of Statistics (CBS) is currently addressing these aspects through an NSDI policy.

  National Planning Commission is in the process of submitting an NSDI policy to parliament for approval. Since the cabinet went into recess until early next year, the document will only be tabled in 2011.

- The ability to integrate this information with the broader issues relevant to decision making and sustainable development. Environmental assessment, monitoring and reporting for sustainable development has to be integrated with social and economic issues.

There must be "an understanding of the development aspirations of society; the characteristics of the environment within which "development" will take place, the conflicts that could arise, and the means of resolving them as well as acceptable trade-offs" (UNEP 2003).

Table 3: initiatives' focus and objective summary

Initiative/Project	Focus	Objectives
Environmental Information Service of Namibia (EIS)	All environmental information	The EIS is a free, online information resource for Namibia.
NamInfo	Environment and more broad	To collate and disseminate environmental, social and economic related statistics.
Environmental management plan	Drilling works	To ensure environmental protection, meet legal requirements, and maintain good community relations.
Rangeland research	Rangeland research	To address rangeland deterioration, and to increase rangeland productivity.
Environmental Education and Information Service (EEIS)	Integrated environmental indicators	To produce annual (?) ISoER To make environmental information freely available in the country.
African Monitoring of the Environment and Sustainable Development (AMESD)	Monitoring of drought, agriculture, fire	To enhance monitoring for preparedness and adaptation to environmental change, including sustainable management of the environment thereby contributing to poverty alleviation in the poorest area of the Namibia.
Polytechnic project on marine remote sensing	Mapping phytoplankton blooms and sulphur events in sea	This project proposes to study historical 'bloom events' in Namibia's Exclusive Economic Zone (EEZ) that are visible as turquoise plumes on satellite images in more detail, especially with regard to their: - frequency, - seasonality, - location : origin and trajectory of most blooms, - size and changing of size of bloom events, - relation to chlorophyll a concentration.
Water quality monitoring of the central water supply dam	Water quality	To monitor the changes in trophic state on the water in the dams.
NACOMA	Marine and coastal biodiversity	The aim of the initiative is to be a cost-effective collection and dissemination mechanism for coastal and marine biodiversity.
Integrated Community-based Ecosystem Management (ICEMA)	Community Based Natural Resource Management (CBNRM) - Conservancies	To monitor natural resources in conservancies.

4.2.3. Time frames and key role players

Table 4 summaries the time frames and key players in the various initiatives. It appears that most of the initiatives tend to be project-based (70), with funding (Table 5) available for a defined period of implementation. One of the problems with project-based initiatives is their breadth, compounded by the abstract nature of sustainability. Project-based initiatives are typically championed by various individuals with financial aid by external agencies for a defined period of time. Only limited resources are availed by government, but also normally only during the period of the project duration. It is thus not surprising that sustainability is a major concern for most of the initiatives (Table 7).

Table 4: Summary of time frames and key players in various initiatives

Initiative/Project	Year of inception	Expected date of completion	Key players (at inception)	Key players (now)	Key players (in future)
Environmental Information Service of Namibia (EIS)	2008	Ongoing	NamPower and NNF	NNF, JARO Consultancy, RAISON	Remains to be seen.
NamInfo	2006	2012	CBS and UN agencies	CBS and UN agencies	Maybe CBS and line ministries
Environmental management plan	?	Ongoing	Hydrogeologists and drilling contractors	Hydrogeologists, drilling contractors and water supply staff of MAWF - DWAF.	Hydrogeologists, drilling contractors, water supply staff of MAWF - DWAF.
Rangeland research	?	Ongoing	MAWF, and Land Owners	MAWF, and Land Owners	MAWF, and Land Owners
Environmental Education and Information Service (EEIS)	2001	2004	MET and Government of Finland	MET	MET
African Monitoring of the Environment and Sustainable Development (AMESD)	2009	No idea	African Union (AU) - European Union (EU) Partnership	African Union (AU) - European Union (EU) Partnership	African Union (AU) - European Union (EU) Partnership
Polytechnic project on marine remote sensing	2006	2011, but can be continued for a long time	Polytechnic of Namibia and MFMR	Polytechnic of Namibia and MFMR	Polytechnic of Namibia and MFMR
Water quality monitoring of the central water supply dam	Since NAMWATER took over from Water Affairs in 1996	The monitoring programme is endless, unless when the dams dry out.	NamWater	NamWater	Not sure
NACOMA	Informatio	Information	Information not	N/A	N/A

	n not yet available	not yet available	yet available (hopefully MFMR & MET)		
Integrated Community-based Ecosystem Management (ICEMA)	2000	Dependent on the duration of a lifespan of ConInfo in which ICEMA is dependent for data.	MET (Jo Tagg), WWF (Greg Stuart-Hill) , Tony Robertson (consultancy)	MET (Jo Tagg), WWF (Greg Stuart-Hill) , Tony Robertson (consultancy)	Not sure

Table 5: Budgeting and funding mechanisms in place for various initiatives

Initiative/Project	Budgeting and funding mechanisms	
Environmental Information Service of Namibia (EIS)	Project development costs provided by European Investment Bank through NamPower and NNF.	Project-based
NamInfo	Government Republic of Namibia (GRN) and the UN.	Project-based
Environmental management plan	It's part of the budget for that particular project. No special budget for it.	Project-based
Rangeland research	GRN	Ongoing
Environmental Education and Information Service (EEIS)	No funding from MET, since most of the activities of the unit have been dormant since 2004, but it is hoped that they will be budgeted for under DEA/MET when activities are revived again.	?
AMESD	EC funded	Project-based
Polytechnic project on marine remote sensing	Polytechnic of Namibia	Project-based
Water quality monitoring of the central water supply dam.	Funds for monitoring are budgeted for within the organization under the section of Water Quality and Environmental Services. There are no external funds available for this programme.	Ongoing
NACOMA	Funds still to be solicited.	Project-based
ICEMA	Funds come from diverse NGOs sources.	Project-based

4.2.4. Data quality, information and products' dissemination

At present, depending on where the data is obtained from, an inference about the quality can be drawn and this remains a very subjective matter (see Table 6). Data quality remains largely a subjective matter in the absence of standards for producing spatial data, criteria to assess data quality and the lack of metadata. According to the status quo study carried out in preparation of the NSDI policy, Willemse and Nangolo (2009) the majority of stakeholders are in favour of standards for spatial data production and for

metadata to exist for all available data. These two mechanisms will improve the quality of data and will inform users (through metadata) if caution should be taken when using specific data. Data collection standards will ensure that spatial data is collected in a consistent and replicable way and thus, based on the scientific soundness of the standards, increasing the accuracy, validity and overall quality of data.

Based on Willemse and Nangolo (2009) survey, there are varying opinions among spatial data users regarding the quality of data they access and use. With limited or no metadata, it makes this judgment subjective. To eliminate or minimize subjectivity with regard to data quality, standards for producing data and metadata could be developed, ratified and implemented.

The main motivating reasons given for the application of standards;

- Consistency in quality;
- Assuring interoperability;
- Replicable approaches/ methods for data collection.

A further question asked stakeholders was who they thought should formulate and enforce such standards. Below were the results;

- NSDI Committee (comprised of government, NGOs, private companies and academia stakeholders);
- NSDI custodian/ responsible ministry;
- Ministry Lands and Resettlement (MLR); and
- The scientific community and appropriate experts.

Data standards appropriate to Namibia are being investigated for producers and if found suitable, will be developed and implemented.

The MET developed an online accessible meta-database and also an Atlas Web Server[2] which gave users access to fundamental and thematic public domain data. Both these two services are no more accessible via MET's website. While the EEIS Unit in MET could play an important role as a stakeholder in the formulisation of the NSDI, the Ministry does not have the establishment of the NSDI as a priority in their Strategic Plan for the period 2007/08 to 2011/12 (Strategic Theme 6: Policy, Planning, Knowledge Management and Communication).

The study carried out by Bayer and Reithmüller (2008) found that stakeholders identified the need for an online accessible clearinghouse where data and metadata can be downloaded. Examples highlighted during the study include the Atlas of Namibia Web Server and the City of Windhoek's web accessible GIS database.

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[2] Based on data from the Atlas of Namibia publication

During the dormant stage underwent by the EEIS unit of MET, most of its activities, especially those of environmental information services and dissemination have been informally but successfully engulfed by the Environmental Information Service of Namibia (EIS), a partnership between NamWater and NNF. This partnership is presently being implemented by NNF (administratively) and RAISON (technically). A lot has been achieved through this project since its inception in 2008; for more insight please visit their website at www.nnf.org.na/eis. EIS has also become very popular among NGOs, private companies and academia as a service responsible for environmental data dissemination at no cost (see also Table 6).

Perhaps the best way for EEIS to reclaim some of its mandates is through a public-private partnership (PPP) with EIS. PPPs are encouraged for:
-   the diversification and value addition of environmental products and services,
-   for capacity building and the transferring of skills and technology especially for the benefit of the public sector,
-   Cost savings through cooperation on data generation, processing and analysis.

4.2.5. Limitations

In order to produce an effective IEM, it is important to understand the situation in organizations (or initiatives) and, based on common challenges, constraints and needs, devise a strategy that is contextual and aimed at improving the current operational environment. To broaden available information about the present situation, stakeholders were asked to state their self-assessed limitations. Table 7 below shows the outcome.

Limiting factors that are regarded by most of the stakeholders as major problems include:
-   Absence of a national policy on spatial data access and sharing (Bayer and Reithmüller 2008, Project NAM/342 2006, Willemse and Nangolo 2009),
-   Bureaucratic inertia - resistance to change (Willemse and Nangolo 2009),
-   Poor organisational communication and coordination (Bayer and Reithmüller 2008, Willemse and Nangolo 2009),
-   Data reliability (40% of current survey)
-   Funding (70% of current survey), and
-   Sustainability (70% of current survey)

Table 6: Summary of information and products of the various initiatives

Initiative/Project	Products (e.g. GIS data, statistical information, reports…)	Dissemination mechanisms	Frequency of release	Target audience	Product quality and value	Quality validation techniques
Environmental Information Service of Namibia (EIS)	Searchable databases, GIS data, statistical databases, pdf and other digital documents, bibliographical references	Downloadable data, reports etc, viewable spatial data (on online spatial viewer) and ability to upload / share data www.nnf.org.na/eis	Updated constantly, as new information becomes available	Anyone working in the environmental field, and broader, in Namibia or southern Africa	Not known	None in place
NamInfo	Statistical information	Tables, graphs and maps	As per new data	Policy makers, researchers, government institutions, media	High	Internally controlled
Environmental management plan	No data or reports available	Tender documents	For each project	Drilling contractors and the workers	No quality measures in place, therefore its value is also questionable	None in place
Rangeland research	Rangeland vegetation data	Articles (in Agricola), Farmers days and workshops	When sufficient data is available for analysis and publication	Landowners and formers	Good	Peer review, editors remarks
Environmental Education and Information Service (EEIS)	Workshop proceedings, online free access to GIS data, ISoER	Workshops, online facilities	Nothing has happened since 2004	All environment related groups, policy makers	Quality depends on sources of primary data.	None in place
AMESD	Satellite images and products	Antenna	Continuously	Environmental/ agricultural/… managers	Very varied dataset – all with own validation mechanisms – it is impossible to list the accuracy of	Very varied dataset – all with own validation mechanisms – it is impossible to list the

					each product here	accuracy of each product here
Polytechnic of Namibia project on marine remote sensing	GIS data	Internet	Source data is available on a continuous basis, mapping will depend on availability of students	MFMR, researchers	To be determined	With MFMR in situ data
Water quality monitoring of the central water supply dam	Water quality data	The results and reports are distributed within the section and to the water supply manager of the central area	Twice a month for Von Bach Dam water quality results and once a month for Swakoppoort Dam. But the frequency of release is not fixed so it may vary as the sampling date is also not fixed.	Environmentalist, senior scientist, and water supply manager central.	High	Internally controlled
NACOMA	No information available at this point	No information available at this point	No information available at this point	No information available at this point	No information available at this point	No information available at this point
ICEMA	GIS data, survey results, count results	Through Namibian Association of Community Support Organisations (NACSO) NGOs & MET	As required	Any one interested in conservancies	Not known	None in place

Table 7: Summary of self-assessed limitations by the initiatives

Initiative/Project	Limitations
Environmental Information Service of Namibia (EEIS)	The need to inform people of the existence of the EIS, promote its value and encourage people to make use of it. Including students, EIA practitioners, government staff, consultants, decision makers and anyone else who uses – or should use – environmental information. Getting away from the mentality that data 'belong' to people (e.g. GRN data, which have been collected with public funds). Ensuring that the project is sustained
NamInfo	Sustainability, funding
Environmental management plan	Namibia water and environmental acts should be implemented for well established company to have EMS or plan. Once both acts are implemented, environmental issues will be addressed accordingly.
Rangeland research	Inadequate personnel
EEIS	Financing and commitment of individuals Sustainability, funding
AMESD	We should not have limitations getting the data (we are not generating it ourselves), disseminating and use by a broad public will be the challenge Sustainability, funding
Polytechnic of Namibia project on marine remote sensing	Enough in-situ data ; enough students Sustainability, funding
Water quality monitoring of the central water supply dam	No limitations
NACOMA	Having this initiative implementable will not be possible without input from all relevant stakeholders. Sustainability, funding
ICEMA	Long-term sustainability, funding

4.2.6. Important issues for integrated environmental management system

Respondents were also asked to list up to 5 key issues that an integrated environmental management system for ISoER must address. Their responses include:

- Promotion of informed decision-making through provision/availability of information (30% of current survey),
- Promotion of information sharing (60% of current survey)
- Getting information to put in the systems (50% of current survey),
- Making the information relevant and timorous (20% of current survey),
- Developing demand for the system (60% of current survey),
- Capture environmental management systems or plans for each organization (70% of current survey),
- Identify environmental challenges Namibia is facing right now (20% of current survey),
- Create database for all environmental challenges (20% of current survey),

- Students/staff with the required skills (able to accurately do repetitious work) (30% of current survey),
- Collaboration and sustainability (90% of current survey),
- Funds to pay the people working on such systems (90% of current survey),
- Encourage or involving the local communities in data (80% of current survey),
- Analyzing data and provide reports to the public (50% of current survey),
- Involving all stakeholders at all level (80% of current survey).

4.3. Conclusions

Namibia has a tradition of uncoordinated spatial data collection and production. Moreover, the responsibility for environmental information is scattered across organizations. This situation makes the process of environmental assessment, monitoring and reporting uneasy to coordinate.

A number of key issues for effective IEM have been identified. These issues can be broadly grouped under the following headings:
- Leadership
- Coordination and integration,
- Participation and collaboration,
- Sustainability,
- Empowerment and capacity building, and
- Data collection and management.

Table 8 is a SWOT analysis of a general situation of environmental initiatives in the country. The analysis performed in view to point out key strategic elements.

Table 8: SWOT analysis on environmental initiatives

Strengths	Opportunities
- Availability of successful initiatives for replication: EIS - Availability of multitudes of data e.g. from AMESD	- Overlap of interests between institutions. - Avenues to develop and strengthen public-private partnerships
Weaknesses	**Threats**
- Participatory approaches for sustainable behaviour - Poor sector coordination, work conducted in isolation - Poor planning at MET's ministerial level (priorities are not well identified or well addressed) - Lack of or insufficient budget to sustain initiatives - Lack of skills in data management issues - Poor social mobilisation around environmental issues - Public-private partnership is weak - Regulations and policies not yet harmonised - Lack of official NSDI policy - No centralised monitoring system in place to measure environmental situation progress - Little cooperation with University and Polytechnic (capacity building, hardware, software)	- New systems may not be promoted by key players without being tested and approved by government.

Main issues related to legislation and regulations are:

- Enforcement still weak due to lack of staff,
- Collaboration between ministries exists but still insufficient to avoid overlapping or gaps
- Lack of standards and regulations for data production and dissemination

5. Proposed Strategy

This strategy is very needs driven and sets out a direction for action. To be effective, the strategy is very much organizational centered and will need to be incorporated into various organizational processes.
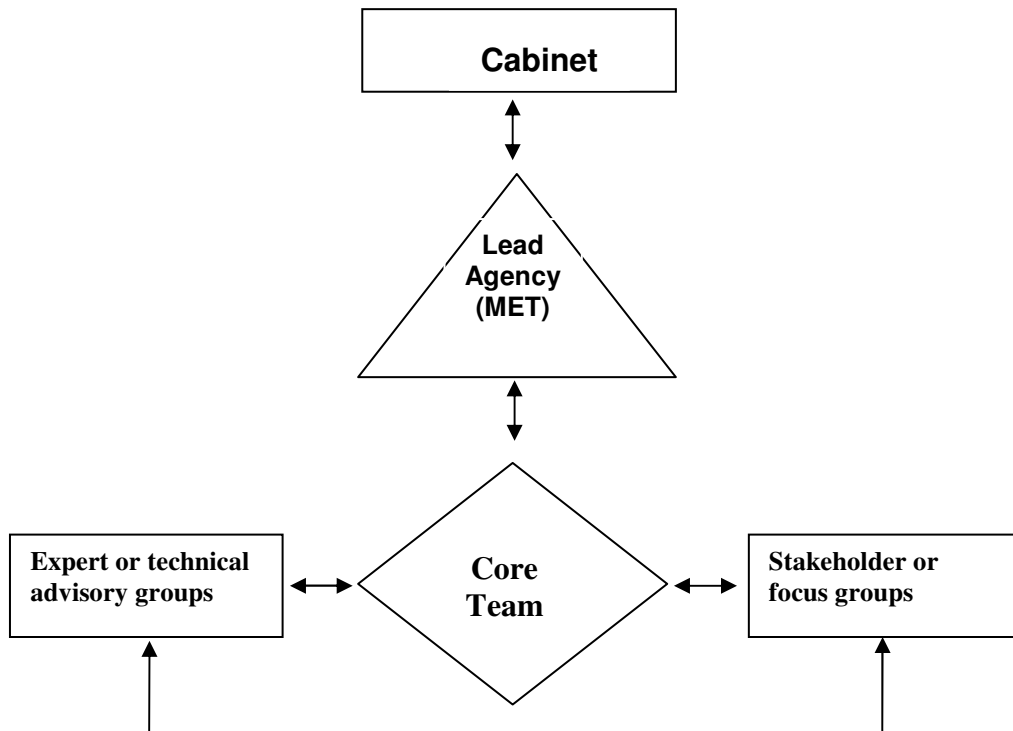
5.1. Organizational structure

Figure 4: is the proposed organizational chart to manage the assessment, monitoring and reporting process

The make up and responsibilities of these groups may be described as follows:

5.1.1. Cabinet
Is the final decision making authority in all environmental matters. It will receive its advice from the lead agency which is the MET.

5.1.2. Lead agency

- MET is the national lead agent for environmental management providing leadership for environmental coordination and consistency across the country. For assessment, monitoring and reporting purposes, it is proposed for MET to establish official focal personnel in each of the other line ministries considered more directly involved in environmental related matters.

It is proposed that the Division of Natural Resources and Data Management (under the new MET structure) take the responsibility to ensure that EEIS activities including, among others, the production of timely ISoER, sustained forum for integrated monitoring and reporting, and those of implementing this strategy have a committed budget under the MET structure.

5.1.3. Core team

Full implementation of the strategy may take some time, and will require a coordinated approach and on-going commitment by strategy partners. It is proposed that the strategy be implemented through MET, by the same unit responsible for ISoER. This core team will have the mandate and responsibility for implementation of the strategy. Experience from EMIN and the situational analysis suggest that a coordinator is also fundamental if momentum is to be maintained and strategy outcomes achieved. Therefore it is proposed that EEIS coordinator (under the current MET structure) be tasked with responsibility for coordinating the implementation, monitoring and review of the strategy. Under the new MET structure this responsibility shall lie with Deputy Director of the Division of Natural Resources and Data Management.

The core team should guide the forum discussed under the lead agency above. Further, the team is entrusted with the following responsibilities:
- To provide an effective, coordinated and flexible environment to facilitate joint actions aimed at finding solutions to specific issues of environmental assessment, monitoing and reporting.
- To promote inter-linkages, encourage timely and relevant exchange of data and information on specific issues and compatibility of different approaches to finding solutions to those common problems.

In fulfilling its mandate, the team shall aim at attaining the following objectives:

- To identify, address and resolve collectively specific problems, issues and tasks on the environmental assessment, monitoring and reporting matters requiring enhanced inter-agency cooperation in a given time-frame through securing effective and collaborative involvement of the relevant agencies and programmes and of other potential partners, as appropriate.
- To provide a forum for an early discussion and sharing of information on environmental assessment and reporting and issues in the environment and spatial data management geared at finding collectively the most effective coordinated approach to the solutions of the problems and of the tasks.
- To lead and coordinate input from strategy partners and others in implementation of the strategy actions.

5.1.4. Expert or technical advisory groups

Environmental assessment, monitoring and reporting should not be understood to be the exclusive domain of the government. Over the past years many municipalities, NGOs and other corporations have been publishing environmental assessments and developing monitoring systems. It is therefore important that institutional arrangements for assessment, monitoring and reporting are consistent with the broader institutional setting in the country.

Participants from various government departments and other organizations who have specialized knowledge and direct access to primary data should form expert groups. The groups will be thematic in nature. The number of groups will be determined by the number of environmental pressing issues in the country. For example, under the current framework of EMIN's top ten environmental issues, there will be 10 expert groups. Or if deemed necessary, some thematic issues could be combined into one expert group. For example, it might be constructive to combine "decline of water quality" with "decline of water availability" issues under one expert group. This is only recommended in cases where the groups do not become too big in number of members and when the issues are really very close and directly related. For a full participation, it is recommended that existing initiatives are part of the expert groups in their respective thematic areas. For practicality, a maximum of five to six members per group is recommended. Each group shall nominate a Chairperson for the group.

Experts should be appointed by MET' Permanent Secretary and should meet once a year on the invitation of the Chairperson, after appropriate consultations. They will operate under a Terms of Reference (ToR) drafted by the core team and endorsed by the inter-ministerial roundtable. It is important that the experts have received consent from their employers before the ToRs are

signed. Experts must also have authority to demand what is expected of others (including the core team and the lead agency) for them to be able to carry out their responsibilities

The groups will function in a results-driven, flexible and cost-effective manner, using modern telecommunication technologies whenever possible and appropriate. They will take into account work in progress under the various environmental initiatives and collaborate with those initiatives, to the extent possible, to facilitate their own work on integrated environmental assessment, monitoring and reporting. MET's EEIS will be providing the secretariat for the expert groups.

Representatives of relevant sectors of the civil society, NGOs and of private companies with a potential and specific expertise related to issues being deliberated by the expert group may participate upon the request of group members by invitation of the Chairperson of the group.

5.1.5. Stakeholder or focus group

This group is filled with representatives of a variety of organizations. Their purpose is to inform the ISoER process about social, political and other preferences, opinion and concerns and to provide decision support for complex policy issues).

4.2. Coordination and integration

Greater integration between management agencies, and a coordinated, cross- sectoral and holistic approach to environmental management will lead to more efficient and effective reporting and reporting outcomes.

If successfully implemented, the proposed organizational structure will close the current gap in integration, collaboration and coordination between the initiatives and organizations. It will further open up opportunities for sharing knowledge and experiences for better alignment of effort and resources, and for establishing partnerships.

5.3. Empowerment and capacity building

There is often considerable variation in the level of skills and knowledge between government and private companies (Rump 1996) relevant to practicalities of initiatives. Factors such as technical expertise, limitations in the extent and availability of hardware and software, can hinder

monitoring process and progress, as do difficulties in accessing relevant and constructive information and advice.

Provision of support and assistance by the lead agency and expert groups to maintain and increase the capacity of the core team is fundamental to maintaining and enhancing the monitoring process. The form this support and assistance takes will vary, but may include the provision of financial support (lead agency), expertise advice, clear, consistent and constructive information.

5.4. Data collection and management

While the content of integrated SoE analyses and monitoring systems should be determined by national policy priorities, the availability and quality of data are also important. The relationship between data and assessment, monitoring and reporting goes both ways: Data are needed to support analysis, but the monitoring and reporting process can be used to make and strengthen the case to monitor and collect data where needed (UNEP/GRID-Arendal, 1998).

Because of the wide range of issues that are likely to emerge in ISoER and in integrated monitoring systems, data needed for the analysis will be stored across the various archives of the respective data custodians. Unfortunately, some of the custodians may have never done SoE and/or monitoring and reporting and may maintain weak links to environment agencies.

There is no need for MET to house a central database carrying all available or required data for which they are not custodians of. A central database for all MET's generated databases is proposed to be housed under the custodianship of the core team. At this stage, some metadata exists for environmental data collected by various organisations up to the year 2003, but is hardly available for most of the datasets in circulation. The MET meta-database should be updated to reflect the current situation, and access to metadata should be made significantly easier. New metadata should form part of the planning for the collection of environmental data and should be generated in a timely manner and made available to the public.

Project NAM/342 2006 proposed the linking of all existing databases through a clearinghouse mechanism. A feasibility assessment for the establishment of a clearinghouse is being carried out under the umbrella of NSDI policy. It is proposed that the strategy adopts the outcome of the assessment.

Through the proposed organisational structure, it is proposed that IEM taps from the various existing initiatives through involvement of experts in expert groups. Key examples of such initiatives include those presented in the situational analysis, most especially:

The NamPower/NNF Environmental Information Services (EIS)

This initiative is intended to provide a 'one stop shop' for public environmental information in digital format and this initiative has already gone a long way in achieving this intent. Its content can be used in the first order of data collection. When assessed on November 24, 2010, the EIS contained information on 4,736 data sets. Environmental spatial data available to the public includes information on biodiversity, vegetation, protected areas, soils, heritage resources and wetlands. The EIS already includes a large volume and variety of information and new information is being added on an ongoing basis. The EIS can serve as a portal to information and sources of information. It can also serve as a platform for requests for data, information and services.

African Monitoring of the Environment and Sustainable Development (AMESD) programme

According to their website (http://www.amesd.org/), the AMESD programme addresses the need for improved environmental monitoring towards sustainable management of natural resources in five regions of sub-Saharan Africa. Namibia is one of the countries where the programme is being implemented. The overall focus is of this programme in Namibia is to enhance monitoring for preparedness and adaptation to environmental change, including sustainable management of the environment thereby contributing to poverty alleviation in the poorest area of the world. The programme is also aimed at increasing the information management capacity of Namibian institutions in support of decision makers at different levels and to facilitate sustainable access to Earth Observation, field and ancillary data, as well as to infrastructure, local capacity and services necessary to sustain long term environmental assessment, monitoring and reporting. AMESD is currently setting up operational information services through a number of beneficiary institutions. These include:

- A fire monitoring station being set up at MET Etosha Ecological Institute,
  Some of the products from the fire station will include: fire alert (detectable fire 50mx50m on MODIS at resolution of 500m), burnt areas (at 500m resolution, these will be monthly, shapefiles), fire danger (at 250m resolution, daily) and possibly colour composites to add with flood mapping (De Cauwer 2010).
- An agricultural station being set up at the Agriculture, Water and Forestry,
  Products from the agricultural service include soil and water index and estimates for crop and livestock assessments and monitoring, agricultural productivity.

- A meteorological station being set up at the Meteorological Service, and
- A satellite data receiving station being set up at the Polytechnic of Namibia.

  This service can be used for environmental monitoring and risk assessment, examples include: land degradation, drought monitoring, flood mitigation and hydrologic modeling.

The AMESD also has a component for capacity building for sustainability. EEIS and other people responsible for environmental monitoring can benefit greatly through capacity building provided through AMESD. The Polytechnic of Namibia and University of Namibia will play an important role by providing training and supporting research.

The programme expects that all beneficiary ministries directly supported under AMESD integrates this spatial data into their regular operational monitoring and reporting activities, and in their management plan.

5.5. Data quality

The ISoER 2004 (MET 2006) report identified both data availability and data quality as issues that limit environmental assessment, monitoring and reporting. Not having any relevant data is obviously a problem, but having poor quality data may sometimes cause more problems than having none at all. Quality control, therefore, should be an essential part of the integrated strategy. The NSDI policy has a provision for the investigation of standards for data producers and formulation thereof by the NSDI Committee. Once addressed, the strategy must conform to these standards.

5.6. Implementation

The actions set out within the strategy are pitched at a relatively general level, and a key step in the strategy implementation will be the development of specific action plans for the priority strategy actions.

Given the above factors, the principal first steps in implementation of the strategy are as outlined in Tables 9 and 1.

Table 9: Proposed planning steps in the implementation of the strategy

Tasks	Organizations involved	Outputs
Step 1: Establishment of a core team	DEA- MET	ISoER core team
Step 2: Establishment of an inter-ministerial roundtable	DEA- MET under guidance of the core team	Representatives officially appointed
Step 3: Consult, identify and establish a national stakeholder's forum for ISoER process	Core team, other ministries directly involved in environmental issues	First IEM for ISoER stakeholders' workshop with MET's endorsement and full stakeholders' participation
Step 4: Consult and review Namibia's top environmental issues of 2001	Core team, national stakeholders	List of key issues
Step 5: Based on the new Namibia's top environmental issues, consult, identify and appoint expert group members	DEA-MET under guidance of the core team	Expert members of all expert groups officially appointed
Step 6: Review the NCEI	Core team, Expert groups	Working NCEI
Step 7: Establish indicator's benchmarks	Core team, Expert groups	Standardized benchmarks established

Table 10: Proposed tasks, responsibilities and results in the development of ISoER

Tasks	Organizations involved	Outputs
Task 1: Engage expert groups	Core team	Draft agreements with working groups (including roles and responsibilities)
Task 2: Prepare production guidelines and assessment/report outlines	Core team and expert groups	Production guidelines and first outlines of ISoER
Task 3: Prepare first drafts and identify key issues	Core team and expert groups	First ISoER draft
Task 4:	All identified stakeholders	Comments on first draft and

National stakeholder consultations		inputs from all stakeholders
Step 5: Revise draft based on comments and inputs	Core team	Second draft
Step 6: Final revisions	Core team and expert groups	Final draft
Step 7: Editing, printing, distribution and marketing	Core team	Finished ISoER

5.7. Possible challenges

There will be obstacles to be overcome when implementing the proposed strategy. These may include:

- Perhaps the first and foremost issue is that of legitimacy from high level for organizational support and resources to implement the strategy. The strategy needs to be endorsed by METs management for financial commitment and support and by all participating organizations.

- Insufficient human resources at the core team and unclear lines of responsibilities for the expert groups will threaten the duration and effectiveness of the strategy. A common understanding is needed between partners that are directly involved in the strategy.

- Assessment of results of the strategy is important in order to review the effectiveness of measures already implemented and to assess whether changes need to be made or additional measures are required.

6.   References

Bayer, C. T. and R. Reithmüller (2008). Priorities, options and opportunities in marketing spatial data products and services of the Directorate of Survey and Mapping (DSM). Project: Support to Land Reform Project Nr: 06.2058.3-001.00, Contract Nr: 06.2058.3-001.00/81107590. Ministry of Lands and Resettlement, Republic of Namibia.

De Cauwer, V. (2010). Unpublished summary notes. AMESD Workshop, 13 -16 July 2010. Gaborone.

MET, (2006).An Integrated State of the Environment Report – Vital Signs of Namibia 2004. Edited by Nangolo E.N., Willemse N.E. and Mwiya S.Ministry of Environment and Tourms.

Nakanuku, L.O., Iinana, E., Zeidler, J., and Katjiua, M. (2001). *Environmental Monitoring and Indicators Network (EMIN)*. Proceedings of the EMIN workshop, Midgard Resort, Okahandja 11-12 June 2001. Department of Environmental Affairs, Windhoek.

Noongo, E. N., Reinikainen, T., Smit, W. and Hashiyana, E. (2002.): *Environmental Monitoring and Indicators Network (EMIN)*. Proceedings of the EMIN workshop, Midgard Resort, Okahandja 13-14 June 2002. Department of Environmental Affairs, Windhoek.

Noongo, E. N., Reinikainen, T., Willemse, N., and Smit, W. (2003.): *Environmental Monitoring and Indicators Network (EMIN)*. Proceedings of the EMIN workshop, Midgard Resort, Okahandja 13-14 June 2002. Department of Environmental Affairs, Windhoek.

Pinter, L., Cressman, D.R. and Zahedi, K. (1999). *Capacity Building for Integrated Environmental Assessment and Reporting – Training Manual*. International Institute for Sustainable Development and United Nations Environment Programme, Winnipeg. http://www.iisd.org/pdf/geomanual.pdf

Rotmans, J., M.B.A. van Asselt and B.J.M. de Vries. "Global change and sustainable development." In *Perspectives on global chang*e, edited by J. Rotmans and B.J.M. de Vries, 3-14, Cambridge: Cambridge University Press, 1997.

Project NAM/342 (2006). GIS Survey and Analysis of Present Spatial Mapping/GIS Activities.

Rump, P.C. *State of the environment reporting: Sourcebook of methods and approache*s. Nairobi, Kenya: Division of Environmental Information and Assessment, United Nations Environment Programme, Report no. TR.96-1, 1996.

UNEP (2003). *Africa Environment Information Network (AEIN): Framework for Capacity Building in Integrated Environmental Assessments and Reporting in Africa.* United Nations Environment Programme, Nairobi.
http://www.unep.org/dewa/africa/docs/en/AEIN_framework_Document.pdf

UNEP/GRID-Arendal. *Cookbook for state of the environment reporting on the Interne*t. Arendal, Norway: UNEP/GRID, 1998. <http://www.grida.no/soe/cookbook/>.

Willemse, N. and Nangolo E.N. (2009). Situational Report: Development of a National Spatial Data Infrastructure Policy. Versacon, Windhoek.

ANNEX 1: Situational Analysis Questionnaire

**SITUATION ANALYSIS QUESTIONNAIRE FOR THE
DEVELOPMENT OF A STRATEGY FOR AN INTEGRATED ENVIRONMENTAL
MANAGEMENT (IEM) for MONITORING AND REPORTING SYSTEMS**
For the

Country Pilot Partnership Programme for Integrated Sustainable Land Management (CPP-ISLM)

Introduction

The CPP Programme aims to put in place effective monitoring and evaluation systems for adaptive management at local and national levels. A detailed Land Degradation Surveillance System was developed which tracks the type and extent of land degradation across Namibia over time. The challenge that remains is to create a coordinated system that is relevant to the specific local context i.e. through indicators chosen by the resource users themselves, which can be directly applied by communities but are also sufficiently scientifically credible and rigorous to be useful for higher level evaluations.

Under previous initiatives, Environmental Monitoring and Indicator's Network (EMIN) was established by the Ministry of Environment and Tourism (MET) to provide an integrated monitoring and reporting system on strategic environmental issues and concerns in Namibia. Its membership comprised of various stakeholders concerned with the multidisciplinary approach to environmental management, sustainable utilization and conservation representing different line Ministries, NGOs, academic institutions, and other organizations. EMIN has not been active since for a while now and this has become a bottleneck to an integrated and systematic monitoring, reporting and early warning on pertinent environmental issues.

It is for this reason that CPP in partnership MET has been deliberating on various strategies to revitalize and strengthen EMIN. At the March 2010 EMIN consultative meeting, a resolution was taken for a thorough scoping of the work, content and information products of existing environmental and related working groups, and other information systems in Namibia. The ultimate product is comprehensive strategy for an integrated environmental management system for systematic monitoring and reporting system.

The purpose of this survey is **to consult and collate on the work, content and information products of existing environmental and related thematic working groups and information systems and to solicit approaches regarding an integrated environmental management information system**. This information will be used to assess the objectives the working groups vis-à-vis those of EMIN, information products, and their sustainability

It is important that as many workgroups dealing with environmental data/information complete this survey to provide adequate information for a full and proper situation assessment of the current and possibly future situation for an integrated environmental management system in Namibia. Please feel free to suggest other people in/ outside your organisation for interviewing.

Your participation is immensely appreciated

1. The respondent detail

Name of interviewee:	
Organisation:	
Contact number:	
E-mail address:	
Date of interview:	
Interviewer:	

2. Are you or is your organization involved in any environmental thematic initiative(s) e.g. environmental working group, environmental monitoring system, environmental information and management system/services, or something related?

(Tick the appropriate box)

a) Yes, I am	
b) No, I am not – but someone else in the organisation is	
a) Yes, I am – but only administratively	
b) Yes, I am – but only technically	

If b) please provide name and contact.
If c) please provide name and contact of the technical person.
If d) please provide name and contact of the administrative person.

Name:
Tel:
Email:

3. What is the name (what is it called e.g. PAN Biodiversity Information and Knowledge Management System) of this initiative and what is its primary focus area?

Name	
Focus area e.g. biodiversity	

4. Which of the following best describes this initiative?

(Tick the appropriate box)

Working group	
Monitoring system	

Information and management system/services	
Others (please specify)	

5. What are the objectives of the initiative?

Please give as much information as possible (e.g. provide reports and minutes if possible).

Objectives:

6. What is the time frame of the initiative and who were/are the key players?

Please give as much information as possible (e.g. provide reports and minutes if possible).

Year of inception	
Expected date of completion	
Key players (at inception)	
Key players (now)	
Key players (in future)	

7. **What budgeting and funding mechanisms are in place for this initiative?**

   Please give as much information as possible (e.g. provide reports and minutes if possible).

Budgeting and funding mechanisms:

8. **Describe the initiative's information products in terms of:**

   Please give as much information as possible (e.g. provide reports and minutes if possible).

Products (e.g. GIS data, statistical information, reports…	
Dissemination mechanisms	
Frequency of release	
Target audience	
Product quality and value	
Quality validation techniques	

9. **What are your self-assessed limitations (of this initiative?)**

Self-assessed limitations:

10. **Name five (5) key issues that an integrated environmental information and management system for Namibia must address?**

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11. **What other similar or related initiatives are you aware of in Namibia?**

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ANNEX 2: Situational Analysis List of Interviewees

Programme	Representative	Organization	Contact	
			Tel	Email
AMESD and Polytechnic project on marine remote sensing	Ms. Vera De Cauwer	Polytechnic of Namibia	061 252 633	vdecauwer@polytechnic.edu.na
MET Info Systems	Mr. Lesley Losper	MET - DEA	249 015	lllosper@yahoo.co.uk
Environmental Information Service of Namibia (EIS)	Dr. John Mendelsohn	RAISON	061-254 962	john@raison.com.na
	Mrs.Alice Jarvis Mr. Tony Robertson	Jaro Consultancy	081 231 9962 061 255 930	tr_aj@mweb.com.na
	Mr. Johannes Ashipala	UNDP	061 2046358	johannes.ashipala@undp.org
Nam Info				
Environmental management plan	Mr. Brian Matengu	NamWater	061-712146	matengub@namwater.com.na
Water quality monitoring of the central water supply dam	Mr. J Sirunda	NamWater	061-712198	sirundaj@namwater.com.na
Rangeland research	Mr. Leon Lubbe	MAWF	061-2087007	lubbel@mawf.gov.na
EMIN – Namibia NaEON – Namibia IUCN; ALM and CBA-Global	Dr. Juliane Zeidler	Integrated Environmental Consultants Namibia (IECN)	061 249204	j.zeidler@iecn-namibia.com
Marine and coastal biodiversity	Ms. Raili Hasheela	NACOMA	064 – 403 905	rhasheela@nacoma.org.na
	Mr. Rod Braby	MET - NACOMA	064-403905	rbraby@nacoma.org.na
ICEMA	Jo Tagg	MET/ICEMA	061-249 015	otagg@mweb.com.na

ANNEX 3: Terms of Reference

TERMS OF REFERENCE

The United Nations Development Programme (UNDP), on behalf of the Namibian Ministry of Environment and Tourism, seeks the services of qualified professionals/firms to support the implementation of the project: **Country Pilot Partnership (CPP) Programme for Integrated Sustainable Land Management**

DEVELOPMENT OF A STRATEGY FOR AN INTEGRATED ENVIRONMENTAL MANAGEMENT INFORMATION SYSTEM

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1. Background of the CPP Programme

The Government of Namibia has identified land degradation as a serious problem which demands remedial intervention, and has recognized that integrated ecosystem management strategies are needed to effectively address the underlying causes. Existing efforts on-the-ground are obstructed by a series of barriers, which undermine their efficacy. Although the government has been, and remains, fully committed to combating land degradation, insufficient capacity at systemic, institutional and individual levels, and inadequate knowledge and technology dissemination constrain the effectiveness of interventions.

The CPP is a programme of seven Ministries, namely the Ministry of Environment and Tourism, Ministry of Agriculture, Water and Forestry, Ministry of Lands and Resettlement, Ministry of Regional and Local Government and Housing and Rural Development, Ministry of Mines and Energy, Ministry of Finance, and the National Planning Commission, GEF and its Implementing Agencies, the European Union, GTZ and the NGO community aimed at overcoming barriers to combating Land degradation and its effects. The goal of the CPP is to "Combat land degradation using integrated cross-sectoral approaches which enable Namibia to reach its MDG #7: "environmental sustainability" and assure the integrity of dryland ecosystems and ecosystem services". The objectives are (i) to build and sustain capacity at systemic, institutional and individual level, ensuring cross-sectoral and demand driven coordination and implementation of integrated sustainable land management (ISLM) activities and, (ii) to identify cost effective, innovative and appropriate ISLM methods which integrate environmental and economic objectives.

Under Outcome 1.4, the CPP Programme aims to put in place effective monitoring and evaluation systems for adaptive management at local and national levels and the specific output to this Outcome is Output 1.4.2 "Information systems specific to land degradation, water resources, land use planning and sustainable development developed and applied". A detailed Land Degradation Surveillance System was developed which tracks the type and extent of land degradation across Namibia over time; in the long run this should demonstrate the achievements of the CPP Programme. Existing research and training institutions (UNAM and Polytechnic) participated in the development of these tools. The challenge that remains is to create a coordinated system that is relevant to the specific local context i.e. through indicators chosen by the

resource users themselves, which can be directly applied by communities but are also sufficiently scientifically credible and rigorous to be useful for higher level evaluations.

The Environmental Monitoring and Indicator's Network (EMIN) was established by the Ministry of Environment and Tourism to provide an integrated monitoring and reporting system on strategic environmental issues and concerns in Namibia. Its membership comprised of various stakeholders concerned with the multidisciplinary approach to environmental management, sustainable utilization and conservation representing different line Ministries, NGOs, academic institutions, and other organizations. At the third Environmental Monitoring and Indicators Network (EMIN III) workshop held in August 2003, the network refined the National Core Environmental Indicators (NCEI) and drafted the first Integrated State of the Environment Report (ISoER) and devised measures to see to it that a spatial data access and sharing policy is formulated. Nonetheless, the fact that the EMIN forum has not been active since then, has been a bottleneck to an integrated and systematic monitoring, reporting and early warning on pertinent environmental issues.

It is for this reason that the Country Pilot Partnership (CPP) for Sustainable Land Management Programme in partnership with the Ministry of Environment and Tourism is deliberating on various strategies to revitalize and strengthen the Environmental Monitoring and Indicators Network (EMIN) in Namibia. A network consultative meeting was held on 24 March 2010 with the ultimate objective of deliberating on various strategies to revitalize and strengthen EMIN. A resolution was taken at the consultative meeting to seek consultancy services in scoping the work, content and information products of existing environmental and related working groups, and other information systems in Namibia. The consultancy will also provide a strategic direction for integrating and systematically monitoring and reporting on pertinent environmental issues and concerns.

2. Objectives of the Consultancy

The overall objective of this consultancy is to develop a comprehensive strategy for an integrated environmental management information system building on the experiences from the Environmental Monitoring and Indicators Network (EMIN) and other environmental information systems:
   a) To consult and collate on the work, content and information products of existing environmental and related thematic working groups and information systems;
   b) To produce strategic report on the status quo and the way forward for an integrated and systematic environmental monitoring and reporting system;
   c) To submit a final comprehensive strategy that proposes the development and implementation of an integrated, systematic and a sustainable environmental monitoring and reporting system.

3. Scope of Work

Scope of Work	Timeline
3.1 Hold inception meeting with the CPP Secretariat to gain direction on the consultancy and submit an Inception Report outlining the consultancy updated work approach and methodology with clear activities and achievable timelines	Week 1
3.1 Undertake desk study and review technical materials and documentation related to environmental monitoring and reporting working groups and system	Week 2
3.2 Carry out the scoping of work, content and information products of the existing thematic environmental working groups and related monitoring systems in Namibia	Week 2
3.3 Consult the work, content and products of various environmental and related thematic working groups and information systems	Week 3
3.4 Liaise with different Ministries, NGOs, academic institutions, and other organizations to collect relevant information and to propose a way forward for a systematic and integrated environmental monitoring and reporting system.	Week 4
3.5 Identify other existing environmental information services in Namibia.	Week 4
3.6 Identify status quo and a direction for an integrated and systematic monitoring and reporting of environmental issues and concerns.	Week 5

4. Deliverables

a) Inception Report
b) A draft report containing strategic directions and recommendations for the systematic and integrated environmental management system for approval by the CPP Secretariat, MET, UNDP and other key stakeholders
c) A presentation on the above (b) at EMIN workshop for discussion and technical inputs
d) Final strategy report incorporating all inputs and comments received at the workshop and proceedings of EMIN workshop.

5. Qualifications and Competencies

Consultant (s) shall be legally registered and shall demonstrate sufficient capacities to implement the required activity in a satisfactory manner. **It is mandatory that all consultant (s) should attach a young graduate from Namibian academic institutions in their team as part of the CPP capacity building strategy.** The successful consultants will have:

- Masters Degree in GIS (Environmental Monitoring), Environmental Management, Geography or a relevant field.
- Four years of work experience in programme management and strategic development work.
- Proven experience in the fields of mapping, GIS, environmental monitoring, Human Geography, or Integrated Sustainable management would be a distinct advantage;
- Prior experience in working with various stakeholders in Namibia including civil society, government institutions, and international organizations;
- Excellent inster-personal and technical communication (oral, written and visual) skills with high level English language writing skills are essential;
- Data Processing Person supported by a young graduate from a Namibian institution of higher learning to perform other survey and enumerating functions.

6. Costs

Bidders are requested to provide a comprehensive budget which separately and clearly identifies both professional /Staff costs including fees, travel and allowances, and actively related expenses.

7. Work Arrangements and Duration

The consultant (s) shall work under the overall supervision and guidance of the CPP Programme Coordination Unit and will report on a regular basis. The services of the consultant (s) are need for a period of 30 working days spread between 1 August 2010 – 29 October 2010. The consultant must absolutely deliver within 1 month which includes reviews of products by key stakeholders. The contract period will be between 1 August 2010 – 29 October 2010. The last two months of the contract will be strictly for internal work between UNDP Namibia Co, CPP Secretariat and MET.