



UNEP Science Strategy 2011-2013

Input to UNEP's Medium Term Strategy



SCIENCE FOR SUSTAINABILITY

© UNEP 2011

This publication may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder, provided acknowledgement of the source is made. United Nations Environment Programme (UNEP) would appreciate receiving a copy of any publication that uses this report as a source.

No use of this publication may be made for resale or for any other commercial purpose whatsoever without prior permission in writing of the United Nations Environment Programme.

Disclaimers

Mention of a commercial company or product in this report does not imply endorsement by the United Nations Environment Programme. The use of information from this publication for publicity or advertising is not permitted. Trademark names and symbols are used in an editorial fashion with no intention of infringement on trademark or copyright laws.

We regret any errors or omissions that may have been unwittingly made.



UNEP promotes environmentally sound practices globally and in its own activities. This publication is printed on 100% recycled paper using vegetable based inks and other eco-friendly practices. Our distribution policy aims to reduce UNEP's carbon footprint.

ACKNOWLEDGEMENTS

Editors and authors: Joseph Alcamo and Peter Gilruth.

Principal organizers of Science Strategy process: Susanne Bech, Norberto Fernandez, Jason Jabbour, Thierry Oliveira and Neeyati Patel.

The Science Strategy is the result of a process that began in early 2009 initiated by the Division of Early Warning and Assessment and was developed together with the UNEP Chief Scientist (upon his arrival in August, 2009).

An important contribution was made by staff from other divisions, in particular the Science Focal Points of divisions. These were: Monika Macdevette, Guido Sonnemann, Stephen Twomlow, Mia Turner, Mohamed Atani, Anantha Duraipappah, Michael Spilsbury, Bob Kakuyo, Balakrishna Pisupati, Jacqueline Alder, Edoardo Zandri, Ravi Prabhu, Alphonse Kambu, Jorn Scharlemann, Heidelore Fiedler, David Piper, Daniel Puig, Bubu Jallow and Olivier Deleuze.

Key input was also provided by experts at the Science Strategy Consultation meeting held in November 2009, in Nairobi. Participants of the meeting were: Dr. Osvaldo Sala, Professor, Brown University, USA; Dr. Claudia Peña, Director of Industrial Sustainability Research Centre of Mining and Metallurgy, Chile; Dr. Jill Jaeger, Senior Researcher, Sustainable Europe Research Institute, Austria; Dr. Atiq Rahman, Executive Director, Bangladesh Centre for Advanced Studies, Bangladesh; Dan Tunstall, Director, International Cooperation, World Resources Institute, USA; and Tony Simons, Deputy Director General, World Agroforestry Centre, Kenya. Dr. Marc Gramberger moderated the meeting.

Design and Layout: Neeyati Patel and Audrey Ringler

TABLE OF CONTENTS

FOREWORD	i
SUMMARY	ii
PART 1	1
INTRODUCTION	2
1.1 <i>Impetus for a science strategy</i>	3
1.2 <i>Working at the science-policy interface</i>	3
1.3 <i>Purpose and goals of the Science Strategy</i>	4
1.4 <i>Capacity building as an important cross-cutting element of the Science Strategy</i>	5
PART 2	7
PRIORITY ACTIONS OF THE STRATEGY	8
<i>Goal 1: Emerging Issues</i>	8
<i>Priority Actions for Goal 1</i>	8
Action 1.1 <i>Implement a Global Environmental Alert Service (GEAS)</i>	8
Action 1.2 <i>Establish a UNEP-sponsored Foresight Process</i>	9
<i>Goal 2 Sustainability Scenarios</i>	11
<i>Priority Actions for Goal 2</i>	12
Action 2.1 <i>Build solution-oriented, sustainability scenarios as part of UNEP projects</i>	12
Action 2.2 <i>Build solution-oriented, sustainability scenarios in member states</i>	13
Action 2.3 <i>Institutionalize scenario analysis at UNEP</i>	13
<i>Goal 3: Sustainability Science</i>	14
<i>Priority Actions for Goal 3</i>	14
Action 3.1 <i>Carry out “reverse” integrated assessments</i>	14
Action 3.2 <i>Reach out to new stakeholder group – science & research ministries in member states</i>	15
Action 3.3 <i>Play “honest broker” among scientific community in supporting the climate and biodiversity negotiations</i>	16
<i>Goal 4. Scientific Competence</i>	17
<i>Priority Actions for Goal 4</i>	17
Action 4.1 <i>Increase impact of UNEP scientific assessments</i>	17
Action 4.2 <i>Increase the impact of UNEP publications</i>	18
Action 4.3 <i>Establish new strategic scientific partnerships</i>	19
Action 4.4 <i>Strengthen scientific competence of UNEP staff by providing goals and incentives</i>	20
Action 4.5 <i>Improve the coherence of inputs to UNEP science committees</i>	21
PART 3	23
TOWARDS IMPLEMENTING THE STRATEGY	24
ANNEXES	27
Annex I: <i>Current (2010-11) science-related activities at UNEP</i>	28
Annex II: <i>Landscape of ongoing assessments with UNEP's participation (updated 04 August 2010)</i>	31

FOREWORD

Science is at the foundation of UNEP's work and so its Science Strategy aims to lay out a clear pathway for strengthening this cornerstone in the service of member states. The new Science Strategy advances four clear goals towards this direction.

First, UNEP will enlist the best science to identify the most critical of the global environmental issues facing society over the coming years. It will keep the world abreast of "environmental events" as they happen, and bring together leading scientists and experts in relevant fields assist in anticipating developments that may be on or just over the horizon.

Second, UNEP's Science Strategy will evolve its work on scenarios to boost support for sustainable development and accelerate a transition to a low carbon, resource efficient Green Economy that also addresses poverty eradication.

Third, UNEP will not only deepen its engagement with the scientific community but will be more proactive in putting the challenges of sustainability higher on the international research agenda, including by strengthening and further developing its partnerships within the UN family and scientific umbrella organizations. The Strategy will actively harness UNEP's convening strengths to bring together researchers to analyze and recommend actions able to address persistent and emerging issues at the frontiers of science and policy.

Finally, UNEP will strengthen its own capacity to work at the science-policy interface by improving its procedures for assessments, improving the credibility and impact of its publications by enhancing their coherence and scientific rigour, and setting up more strategic partnerships with the scientific community.

Achieving these goals requires a long-term commitment by UNEP's divisions and the support of its member states and partners.

It will also require that the Strategy is fully integrated into the Medium-Term Strategy and planning and programming of UNEP's work. Reinforcing, revitalizing, renewing and re-visioning UNEP's critical work on the science-policy interface represents a new, challenging but also exciting phase for UNEP.



Achim Steiner,
UN Under Secretary-General, UNEP Executive Director
February, 2011

SUMMARY

The Science Strategy addresses the need to strengthen the scientific base of UNEP and to reinforce its work on the science-policy interface. The Strategy has four overarching goals covering the areas of “emerging issues”, “sustainability scenarios”, “sustainability science”, and “scientific competence”. The first three of these areas are outward-looking, and the fourth addresses the internal situation of UNEP. The four goals are:

1. **Anticipating the future:** UNEP takes the lead in the UN system in identifying emerging environmental issues.

To make progress towards this goal, two actions will be taken: First, UNEP will implement a *Global Environmental Alert Service* for keeping the world informed in a timely fashion about critical environmental developments. Second, it will sponsor a regular *Foresight Process* for ranking the most important emerging issues and conveying this information to a wide audience.

2. **Designing the future:** UNEP becomes a major global player in developing “solution-oriented”, sustainability scenarios.

This goal will be accomplished by building solution-oriented, sustainability scenarios as part of various projects in the POW. UNEP will also assist member states to build scenarios as part of the GEO-5 follow-up, and set up a cross-divisional Scenario Team to support the development of scenarios both internally and externally.

3. **Catalyzing needed science:** UNEP takes a lead in formulating and advocating a worldwide sustainability science agenda that meets the critical needs of sustainable development.

The actions for achieving this goal are: (1) carrying out “reverse” integrated assessments” in order to identify key questions from the policy arena that should be dealt with by the scientific community; (2) making contact with Science & Research ministries in order to expand the area of the science-policy arena in which UNEP operates; and (3) playing an “honest broker” role in supporting climate and biodiversity negotiations.

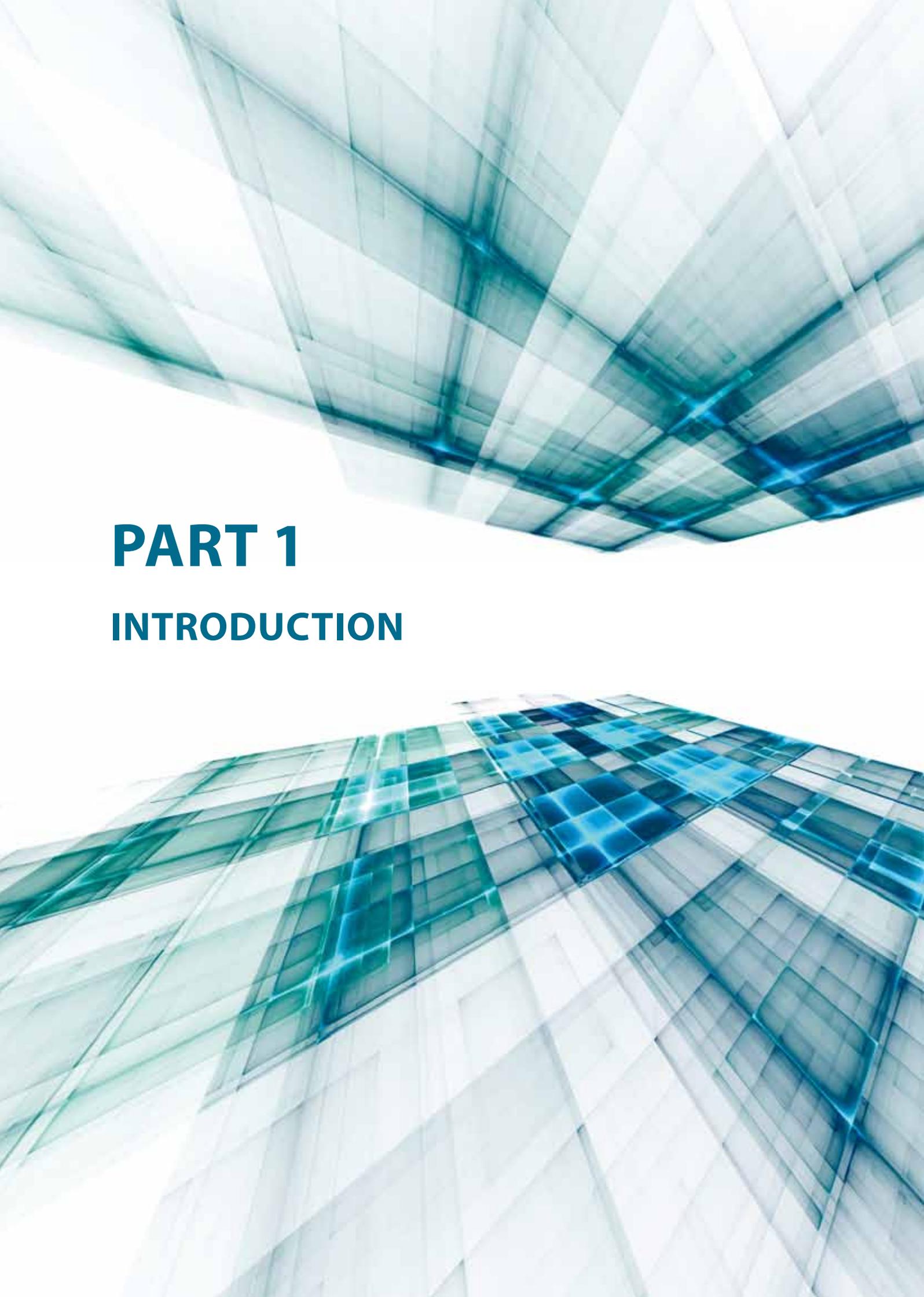
4. **Bolstering UNEP's scientific weight:** UNEP equips itself scientifically to accomplish more at the science-policy interface and to strengthen itself as the “leading global environmental authority”

To accomplish this goal UNEP will (1) increase the impact of its scientific assessments and publications by improving their coherence and scientific rigor, (2) establish new scientific partnerships, (3) strengthen the scientific competence of its staff by providing goals and incentives for them to engage with the scientific community, and (4) improving the coherence by which science is used in the various scientific advisory committees in the UNEP family.

Capacity building to serve UNEP's government clients will play a large role in the Strategy especially in Goals 1 to 3: This will include training experts in developing countries on how to carry out foresight studies and how to develop sustainability scenarios. It will also include conducting “reverse integrated assessments” with partners in developing countries to identify the key environmental policy issues in these countries that require scientific research.

The Science Strategy will be implemented chiefly **by embedding it in the Programme of Work** of various divisions rather than executing it as a stand-alone, top-down activity.

Summing up, achieving the four goals of the Science Strategy will greatly enhance the role of science in helping UNEP carry out its mission.



PART 1

INTRODUCTION

INTRODUCTION

As the principal body for the environment in the UN system, UNEP has a mandate to keep the global environment under review.¹ UNEP provides the world with an important environmental early warning service, and monitors, assesses and reports on the state of the global environment. Science plays an important role in this mandate by supporting UNEP's global, regional and national responsibilities, both normative and operational. Indeed the number of science-related activities at UNEP is large. (Annex I). Since the international community expects UNEP to produce credible, policy relevant reports on the state of the environment, the scientific underpinning of its work is crucial to its mission.

Herein we present a Science Strategy that aims to reinforce the scientific underpinning of UNEP's work. We begin by presenting the impetus for this strategy provided by UNEP's governing institutions and Medium Term strategy, and then review how UNEP's work at the science-policy interface influences the Strategy. Following this, we present the goals and priority actions of the Strategy, and the general scope for implementation.

¹ Functions and responsibilities of UNEP are outlined in UN General Assembly Resolution 2997 (XXVII) of 15 December 1972. UNEP's mission is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations. <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=43>.

1.1 Impetus for a science strategy

Several of the decisions of UNEP's Governing Council (GC) emphasize the importance of the scientific basis of the organization's work as well as the need to promote capacity within Member States to link science to policy. These decisions included the Global Ministerial Environment Forum decision 21/21, paragraph 9 of Governing Council decision 23/1 II, among others.

UNEP responded to these decisions by developing the UNEP Science Initiative and governments have been actively involved in its consultation phases since 2001. At the twenty-fifth Governing Council, governments reconfirmed ...

"... the need to strengthen the scientific base of the United Nations Environment Programme, within its mandate, including through the reinforcement of the scientific capacities of developing countries and countries with economies in transition in the area of protection of the environment".²

The Governing Council of UNEP also highlighted the importance of considering the complementarities between the scientific initiatives of UNEP and the scientific advisory and assessment mechanisms of multilateral environmental agreements.³

In another development relevant to science at UNEP, governments at the UN General Assembly Meeting of 2005 recognized that a strengthened coherence of the United Nations system was necessary for achieving internationally agreed development goals, including those contained in the Millennium Declaration.⁴ In this context, they recognized that environmental science and technology were vital for the attainment of development goals.

And in 2009, governments reiterated the need for strengthened environmental scientific knowledge and assessment – in particular strengthening the scientific capacity of UNEP, including its assessment, monitoring and early warning activities.⁵

But the impetus to strengthen its science base comes not only from UNEP's governing institutions but from its own Medium Term Strategy (MTS) which states that the UNEP should aim to be

"The leading global environmental authority that sets the global environmental agenda, that promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system and that serves as an authoritative advocate for the global environment."

To be the "leading environmental authority" and "authoritative advocate" requires a high level of scientific competence, while "setting the global environmental agenda" means that UNEP also has to be active in influencing the international scientific agenda concerned with global environmental change.

The MTS also emphasizes the important role of science by saying that UNEP should ...

"... become a more effective, efficient and results-focused entity, through ... ensuring its interventions are founded on sound science".

In sum, both its governing institutions and MTS make it clear that science plays an important role in the mission of UNEP, and that this role needs to be strengthened.

1.2 Working at the science-policy interface

In crafting a Science Strategy it is important to consider that much of UNEP's work is neither embedded in the world of science nor in the world of policy, but at the interface between the two. It follows that the Science Strategy should address the role of UNEP on this interface.

How exactly does UNEP operate on the science-policy interface? The simplest explanation is that UNEP ensures the flow of knowledge from basic and applied research to policy action, development

² Ibid. 25/1/II paragraph 6.

³ Ibid. 25/1/II paragraph 8.

⁴ UNGA (2005). 60th Session of the UN General Assembly, 24 October 2005, Resolution adopted by the General Assembly 60/1. 2005 World Summit Outcome.

⁵ UNEP (2009). Strengthening the Scientific Base of the United Nations Environment Programme. Decision 25/1/II. Decisions adopted by the twenty-fifth session of the Governing Council/Global Ministerial Environment Forum. Advance copy.

and ultimately societal benefits. Importantly, it also encourages the flow of information from the policy arena back to the scientific community. In particular, UNEP works at the science-policy interface in four ways:

1. *UNEP identifies new scientific issues of impending importance to the policy community*

Although the environmental science landscape is complex and often fractious, UNEP has the task of reviewing the latest findings and bringing them to the attention of decision makers in a systematic manner. For example, DEWA identifies new issues in the UNEP Yearbook and the Climate Change Science Compendium, and DTIE has identified new issues of importance regarding chemicals in the environment. Topics recently brought to the attention of decision makers include the issue of black carbon as both a contributor to global warming and air pollution; and ocean acidification and how it may curtail the ability of the ocean to moderate global warming.

2. *UNEP uses scientific methods and tools to illuminate policy challenges and present policy options to policymakers based on best scientific understanding.*

For example, UNEP has used remote-sensing analysis to identify critical changes in the Mau Forest (Kenya) and Lake Faguibine (Mali), economic modelling to illuminate pathways to a green economy, and scenario analysis to develop sustainability scenarios as part of the GEO process.

3. *UNEP assesses the state of scientific knowledge about an issue and communicates it to policymakers.*

Not only does UNEP use scientific methods to illuminate particular problems, but it uses a particular method – integrated assessment – to sum up a large body of knowledge and communicate it to policymakers and stakeholders. It does so in order to keep the global environment under review through such products as the Global Environment Outlook, the Climate Compendium and the blue carbon assessment. Connected with its assessment work, UNEP also instigates dialogues between scientists and policymakers to promote mutual learning and understanding. A recent example is the series of “Science-Policy Dialogues” held in Asia and Africa.

4. *UNEP convenes scientists to work on problems identified by the policy community.*

While a large part of UNEP's work has to do with translating science for policymakers sometimes it also goes in the other direction in that it also helps policymakers communicate their research needs to scientists. Examples are the Millennium Ecosystem Assessment follow-up, the Global Environment Outlook process, and the activities of the Resource Efficiency Panel (see Annex II). As another example, UNEP has convened scientific experts to assess the “emissions gap” between emission reduction commitments and emission limits as part of ongoing international climate negotiations.

1.3 Purpose and goals of the Science Strategy

Taking into account the need to strengthen the science base of UNEP and the ways in which UNEP operates at the science-policy interface, we now present a Science Strategy for UNEP. The main purpose of the Strategy is to strengthen the science base of UNEP, building on past efforts. The Strategy can be viewed as part of UNEP's continuing dialogue with governments on how to build and strengthen scientific capacity in UNEP and at the national level.

The Science Strategy gives high priority to promoting the flow of information across the science-policy interface within the communities that UNEP operates. This will be accomplished by scanning knowledge sources for potential environmental threats and solutions, looking at future environment and development scenarios that could inform current thinking, influencing the sustainability science agenda, and applying scientific assessment methods to bring the best expertise together to inform the global community on environmental challenges.

We call the Strategy “Science for Sustainability” because sustainability science is a central theme. We define sustainability science as a problem-oriented, applied science that provides the scientific knowledge for enabling and advancing environmental sustainability. Sustainability science is particularly important from UNEP's point of view because it:

1. *Promotes a "systems view" of the environment.* (e.g. understanding the ocean and coastal zone operates as an important system for regulating climate.)
2. *Focuses on scientific questions that underpin immediate and urgent policy issues.* (e.g. the science behind actions to conserve biodiversity.)
3. *Works towards solutions for achieving environmental sustainability.* (e.g. green economy initiatives for clean, resource-conserving production of manufactured goods).

The Science Strategy addresses both external goals of UNEP, i.e. how it operates with the rest of the world, and internal goals, i.e. how it can improve its own performance with regards to science. Goals 1, 2, and 3 are mostly outward-looking, whereas Goal 4 pertains mostly to internal issues.

The four main goals of the Strategy are:

1. **Anticipating the future:** UNEP takes the lead in the UN system in identifying emerging environmental issues
2. **Designing the future:** UNEP becomes a major global player in developing "solution-oriented", "sustainability" scenarios.
3. **Catalyzing needed science:** UNEP takes a lead in formulating and advocating a worldwide sustainability science agenda that meets the critical needs of sustainable development.
4. **Bolstering UNEP's scientific weight:** UNEP equips itself scientifically to accomplish more at the science-policy interface and to strengthen itself as the "leading global environmental authority"

How do these goals intersect with UNEP's work at the science-policy interface, as described above?

Goal 1, "emerging issues", reinforces UNEP's work task at the science-policy interface of identifying "new scientific issues of likely importance to the policy community"

Goal 2, "sustainability scenarios", help UNEP identify new scientific issues because ideas about new issues are a common by-product of scenario exercises.

Sustainability scenarios are also an example of a "scientific method to illuminate a policy problem or identify solutions to a policy problem". Through scenario building UNEP also "convenes scientists to work on problems identified by policy community." Finally, scenario building is an important technique for "assessing and communicating the state of scientific knowledge about an issue to policymakers."

Goal 3, "sustainability science", includes many Priority Actions that strongly support UNEP's work on "convening scientists to work on problems identified by the policy community".

Finally, Goal 4, "scientific competence", strengthens UNEP's "use of scientific methods to illuminate a policy problem or identify solutions to a policy problem", and supports UNEP's efforts to "assess and communicate the state of scientific knowledge about an issue to policymakers."

In sum, the four goals of the Science Strategy will reinforce UNEP's work at the science-policy interface.

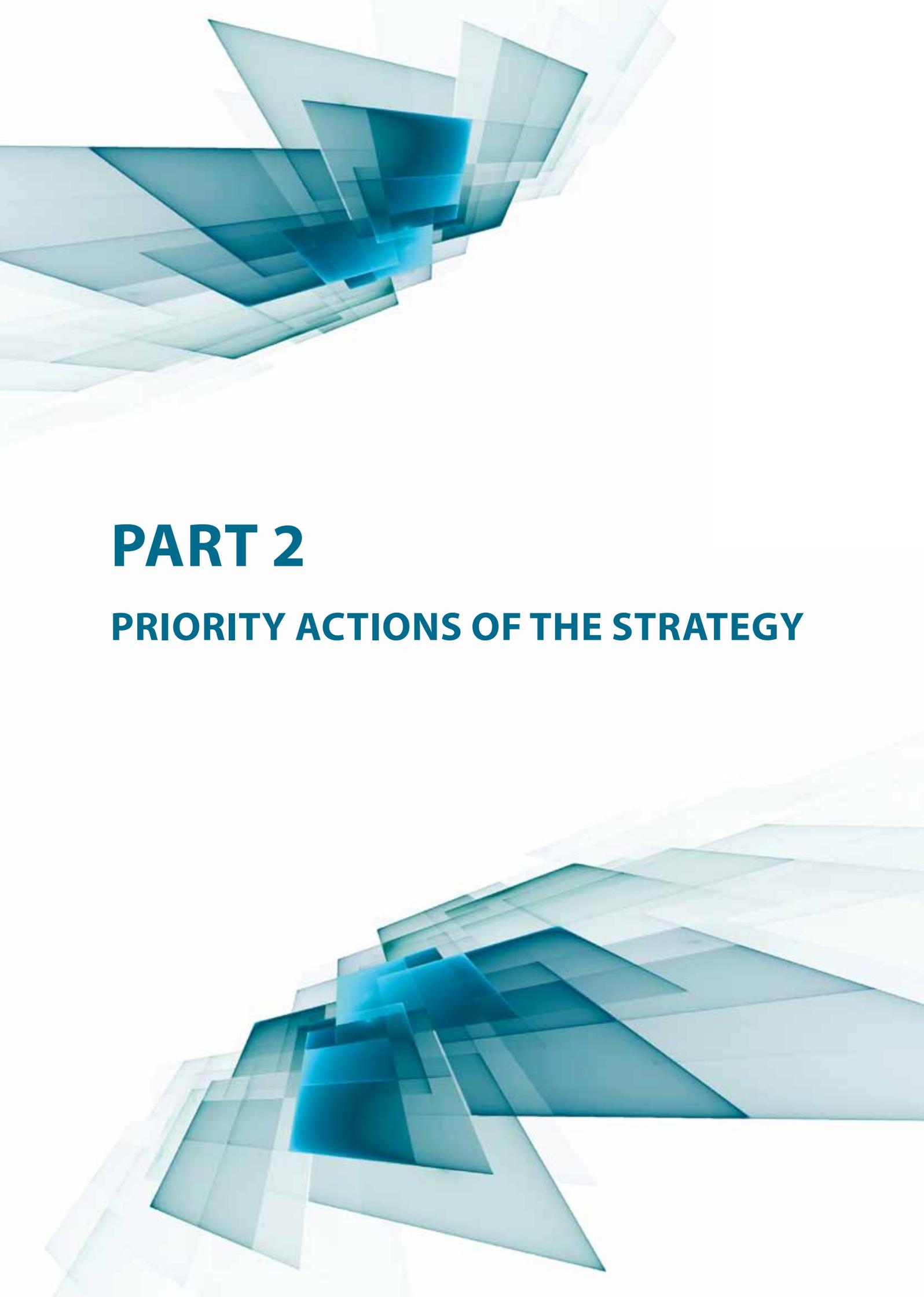
1.4 Capacity building as an important cross-cutting element of the Science Strategy

Capacity building is an important theme running through the Science Strategy. The Science Strategy supports the Bali Strategic Plan (UNEP/GC.23/6/Add.1) which calls for (developing) countries to "create and share key scientific data and knowledge on the environment as critical inputs to sustainability analysis and keeping the global state of environment under review." The premise is that keeping the environment under review (e.g. Goals 1 and 3 specifically) is not UNEP's task alone, but rather a shared responsibility that UNEP supports. The Science Strategy will promote this sharing of data and knowledge by encouraging the following practices as part of its menu of activities to which support national partners:

- open data access to allow wide participation of players,
- improved access to on-line publications,

- promotion of data standards as a prerequisite for data interoperability,
- building communities of practice and networks, wherein data providers and users can develop environmental applications to meet needs for sustainability planning,
- inclusion of social and economic data sets and linking to physical environment and human dimensions
- promotion of tools such as UNEP-wide training platforms (MENTOR), internship programmes on "working at the science-policy interface" for young ministerial officials, Virtual Scientific Mentoring Programme, Roundtable science-policy events, etc.

The following pages describe a range of capacity building activities such as training experts in developing countries to carry out Foresight Studies (Goal 1), working with developing countries to develop sustainability scenarios (Goal 2), and conducting "reverse integrated assessments" with partners in developing countries to identify the key environmental policy issues in these countries that require scientific research (Goal 3).

The background features abstract, overlapping geometric shapes in shades of light blue and white, creating a sense of depth and movement. The shapes are layered, with some appearing more prominent than others, and they seem to be part of a larger, complex structure.

PART 2

PRIORITY ACTIONS OF THE STRATEGY

PRIORITY ACTIONS OF THE STRATEGY

Goal 1: Emerging Issues

Anticipating the Future: UNEP takes the lead in the UN system in identifying emerging environmental issues

As the UN organization with the mandate to keep the global environment under review, UNEP has an opportunity to be the lead UN organization in alerting the world to emerging environmental issues. To do so it must enhance its ability to provide regular updates to its member states and community about what it believes are topics about to emerge on the global environmental scene.

But identifying emerging issues also fulfills internal needs of UNEP – new topics need to be considered every two years in its Programme of Work; the annual UNEP Yearbook has to be on top of the latest environmental issues; and UNEP's Global Environmental Outlook (GEO) has to provide its readers with information about policy options and alternatives based on emerging issues and emerging environmental science and policy.

To achieve a UN-wide leadership role in identifying emerging issues and to fulfil its internal need for this information, we propose a new two-tier approach:

Part 1. Implementing a Global Environment Alert Service (GEAS). This service will send alerts at frequent and regular intervals about critical events and new issues having to do with the global environment. The alerts will take the form of a monthly Global Environment Alert Bulletin which will be widely distributed to UNEP's member states, staff, and community. For these alerts UNEP staff will continuously "scan the horizon" and draw on Earth observation data, the scientific literature, and scientific conference results.

Part 2. Establishing a regular UNEP-sponsored Foresight Process. This will be a systematic procedure for canvassing top experts in order

to identify and rank emerging issues according to various importance criteria. The Foresight Process will be repeated every two years and its outputs will be broadly distributed to its member states, within the UN family, and to other external audiences. It will also provide direct input to UNEP's POW planning process, various scientific advisory committees in the UNEP family, the GEO process and to the annual Year Book. The Foresight Process will rely strongly on the views of the scientific community at large.

Through this two-tier approach UNEP will greatly strengthen its role in identifying and communicating emerging issues – On one hand the *Global Environment Alert Service* will provide a continuous flow of information to the world about the latest environmental events of importance. On the other hand the *Foresight Process* will build on expertise from a large global network of experts and every two years carry out a critical review and ranking of emerging issues.

These two approaches are very complementary and greatly enhance UNEP's ability to stay on top of emerging issues and to take a leadership role internationally in alerting the world and its own community about these issues.

Priority Actions for Goal 1

Action 1.1: Implement a Global Environmental Alert Service (GEAS)

Objectives and Tasks

The purpose of the GEAS is to provide the UNEP community and its network with near real-time information about critical environmental events and issues. A bi-weekly Environmental Alerts Bulletin will be produced and widely distributed through email and through web-site posting.

The GEAS will have the following main components:

a. Environmental Hazard Alerts

Data and information will be automatically streamed through GEAS from earth monitoring and observing systems as well as from other sources at both local

and global scales. UNEP will screen and analyze the data for event detection, prioritization and scientific credibility. It will package the information into formats appropriate to a broad range of users and actively disseminate it for timely decision making through Emails, web services and web based real-time maps.

b. Environmental Hotspot Alerts

Through GEAS, UNEP and partners will provide a comprehensive, visual presentation of scientifically verifiable information on changes in the global environment – both the good and the bad – acquired and assessed through state-of-the-art remote sensing technology. The objective is to document visual evidence of global environmental change resulting from natural processes and human activities and the interaction between them. The change studies will contain photographs, satellite images, maps and narratives that provide insight into the many ways the environment has changed and continues to change.

c. Environmental Science Alerts

Using GEAS, UNEP and partners will systematically search various scientific literature databases and science news services for peer-reviewed, policy-relevant environmental science articles. These findings will be condensed into short reports or briefing notes designed to support environmental decision making. These short reports and briefing notes will be delivered through the GEAS subscription service based on user profiles tailored to specific regional and thematic interests.

d. Other Alerts

The system will be able to expand to include other types of environmental information that can easily be collected and disseminated through the alert delivery system. Such examples could include information such as major environmental policy developments.

Expected Products and Results

- A regular Environmental Bulletin distributed frequently and widely to external and internal audiences, containing critical new information about environmental hazards, environmental hotspots, and new environmental science.

- Substantially bolsters UNEP's role as an important source of current environmental information.

Action 1.2: Establish a UNEP-sponsored Foresight Process

Objectives and Tasks

While the GEAS will provide timely, urgent information about environmental events and issues, the purpose of the UNEP Foresight Process is to provide every two years a careful, authoritative ranking of the most important emerging issues having to do with the global environment. The first objective of the Foresight Process is inform the UN and the global community as the key source of information about emerging issues. A second objective is to identify emerging issues that should be considered in the planning of UNEP's program of work.

At the core of the process will be an Expert Panel consisting of distinguished members of the science and policy communities recruited from developing and industrialized countries because of their knowledge of key environmental and related issues. The Expert Panel will also include the Chief Scientist and other members of senior management at UNEP. The Expert Panel will make an initial selection of issues, based partly on a survey of issues of UNEP staff. The initial selection will then be reviewed by hundreds of scientists as part of an electronic Delphi consultation. Scientists from developing countries will be associated with the Delphi process as part of UNEP's capacity building efforts. Based on the results of this consultation, the Expert Panel will select and rank a final set of issues. The foresight process will take a total of one year, and be repeated every two years so that it fits into the planning of UNEP's biennial Programme of Work. Institutionally, the process will be embedded in DEWA, consistent with its early warning function.

Once the Foresight Process is completed, a special effort will be taken to disseminate its results to the outside world and within UNEP through briefings, reports and workshops (see below "Expected Products and Results").

It is important to make clear what the foresight process will and will not do. Its principal aim is to create a vigorous and consistent procedure for identifying and ranking emerging issues and making this information available to a wide external and internal audience. Currently, new issues within the UNEP community are identified *ad hoc*. The proposed foresight process will increase the confidence of UNEP that it has identified the most important emerging issues. The emphasis here is on *increase the confidence of* because such a process cannot guarantee that the most important issues will be identified. Nevertheless, it will clearly provide added value to the current approach.

But there are also things the foresight process will *not* do. – The process is not meant to hinder the creativity of individuals or divisions within the UNEP community from themselves identifying issues that they consider new and important. Instead it is meant to complement the effort of individuals. In a similar vein, the foresight process should not be the only source of input in deciding on new issues for UNEP to work on.

As part of UNEP's capacity building effort, workshops will be held in developing countries to train government and NGO experts on how to carry out their own foresight exercises. Such exercises would be a valuable tool for environment and science ministries to help them anticipate important national issues related to the environment. For NGOs, a foresight exercise can provide information very useful for their setting of priorities.

Expected Products and Results

External Audiences (among others):

- Briefings:
 - at UN meetings such as the Global Ministerial Environmental Forum (GMEF) as input to discussion of future issues for UNEP and global environmental community;
 - to the Global Environmental Facility Council

- as direct input to discussions on the future programming of GEF resources, and to the Scientific and Technical Panel of Global Environmental Facility (GEF) – as input to scientific advice to GEF
- to Resource Efficiency Panel of DTIE
- Semi-annual UN conference on emerging thematic issues, e.g. tipping points.
- To reach a broad external audience, publishing of a series of in-depth reports describing particular emerging issues identified by the foresight process.
- Capacity building: Training experts in developing countries on how to carry out foresight exercises as part of POW activities.

Internal Audiences (among others):

- Briefings:
 - of senior UNEP managers as input to preparation of POW
 - of Yearbook staff as input to selection of issues and planning of UNEP Annual Yearbook
 - meetings with GEO-5 staff as input to Emerging Issues component of GEO-5
- Distribution of Emerging Issues report.

Box 1. A UNEP Foresight Process

The entire process will take one year and be repeated every two years to correspond with the POW planning cycle. It will include the following steps:

- 1) *Background Document on Emerging Issues* – UNEP staff⁶, especially the Science Focal Points, canvass the UNEP community for opinions about important emerging issues. Based on this canvass, UNEP staff prepare a brief report – “Background Document 1” – as background document for the first expert panel meeting. One source of information will be the alert bulletins produced by the Global Environmental Alert Service.
- 2) *First Expert Panel Meeting* – The expert panel will consist of a combination of outside and internal experts. At their first meeting the panel will decide on a preliminary list of emerging issues and topics based on their own expertise and Background Document 1. Cooperation with SCOPE and/or ICSU should be considered here for identifying experts and for the Delphi Electronic Consultation in the next step. In addition, these organizations could provide valuable input to the selection and ranking of issues.
- 3) *Background Document 2 for Delphi Electronic Consultation* – UNEP staff prepares Background Document 2 for the Electronic Delphi Consultation (brief essays on issues identified at Expert Panel Meeting 1).
- 4) *Electronic Delphi Consultation* – UNEP staff or consultant organizes an electronic Delphi consultation of up to 300 scientists. During this consultation scientists will be asked to comment on, and rank, the preliminary list of issues. Participants will receive the Background Document 2 described above so that they understand the issues under consideration.
- 5) *Evaluation of Delphi Results* – UNEP staff evaluate the Delphi consultation results.
- 6) *Second Expert Panel Meeting* – The Panel discusses the results of the Delphi consultation and agrees on and ranks a final list of issues.
- 7) *Reporting* – Briefings are held within and outside UNEP with key committees and organizations. UNEP staff summarizes findings in an Emerging Issues document aimed at a wide audience.

⁶ Here “UNEP staff” means DEWA staff working together with the Chief Scientist’s Office and the cross-divisional Science Focal Points

Goal 2: Sustainability Scenarios

Designing the Future: UNEP becomes a major global actor in developing “solution-oriented, sustainability” scenarios

UNEP can strengthen its important role as advocate of long term environmental sustainability by commencing a major effort to build sustainability scenarios. This effort would be a valuable add-on to the assessments, capacity building and other activities currently used by UNEP to fulfil its mission.

Although UNEP already uses scenarios in many studies, the goal here would be for UNEP to

intensify its scenario building efforts and to become a world centres for *solution-oriented, sustainability* scenarios. Examples of sustainability scenarios are “Sustainability First” from GEO-4, “Techno-Garden” from the Millennium Ecosystem Assessment, and “Values and Lifestyles” from the World Water Vision Exercise.

What is the added-value of building sustainability scenarios? Scenarios are a powerful tool for organizing and communicating large amounts of complex information about steps to solving environmental problems. They illustrate how alternative policy pathways may, or may not, achieve an environmental target. They are a device for helping policymakers and others to “think big” about an environmental issue, and for getting stakeholders involved in the development of public policies.

Sustainability scenarios have provided valuable input to the policy process in many different parts of the world. For example:

- The Caribbean Sea Assessment produced scenarios that showed that a policy of "niche" tourism would help avoid a collapse of fish stocks and loss of tourists expected under business-as-usual type of scenarios.
- The study "India Urban" produced a sustainability scenario "Low External Input Sustainable Activities (LEISA)" which illustrated how cities in south western India could increase the well being of their inhabitants and conserve ecosystem services through a combination of adaptive management to promote traditional wisdom, ethical trading, recycling jobs and agro-employment in cities and villages to reduce emigration.
- The "Great Transitions Scenario", developed with UNEP's help as part of the Rwanda State of Environment and Outlook Report, pointed out the policy steps leading to "social regeneration" and natural resources management with popular participation of all stakeholders.

These are just three of the many sustainability scenarios that have helped policymakers and stakeholders around the world visualize the steps needed for achieving both increased well being for people and environmental sustainability.

This Goal has three priority actions. The first is to build solution-oriented scenarios in various projects at UNEP. These scenarios will bolster and enhance these projects by providing an effective vehicle for explaining how various policies can be achieved. The second is to assist UNEP member states in developing their own sustainability scenarios as a follow-up to GEO-5 and the Poverty and Environment Initiative. The third action is to "institutionalize" scenario building at UNEP by setting up a Scenario Team for supporting scenario exercises and capacity building.

Priority Actions for Goal 2

Action 2.1: Build solution-oriented, sustainability scenarios as part of UNEP projects

Objectives and Tasks

The purpose of this Action is to build sustainability scenarios as part of a variety of planned UNEP projects in the POW of 2010 and 2011. The building of scenarios in various divisions will be supported by a Scenarios Team described in Action 2.3. UNEP will build scenarios as part of its planned activities in the POW for 2010 and 2011.

The following scenario exercises will be carried out⁷:

- a. *Scenarios of Global Resource Efficiency (DTIE)* – These will be global scenarios that describe sustainable management of resources. The first set of scenarios will describe the future metals economy of the world, and how recycling and other actions can slow the depletion of these commodities and minimize their environmental impacts. Later, scenarios of other resources will be developed.
- b. *REDD Scenarios (DEPI)* – These will be national and global scenarios illustrating various options for implementing REDD+ policies and their impact on deforestation, afforestation, greenhouse gas emissions, and carbon uptake from the atmosphere.
- c. *GEO-5 Scenarios (DEWA)* – This will be a global "Challenge" scenario illustrating the importance of long-term transformative change (changing consumption patterns, increasing production efficiency, reducing production losses) on mitigating global environmental problems.

⁷ These scenarios will have different objectives but common methodological features that can be supported by UNEP coordination:

- Depend on modelling calculations
- Likely to include storyline development
- Must cope with uncertainties
- Likely to be normative, in that they will start with point in the future and work backwards.

Expected Products and Results

As described above, the main products would be various sets of scenarios that would be produced as part of the output of the POWs of DTIE, DEPI and DEWA:

- Scenarios of the world metals economy
- Scenarios of REDD+
- Scenarios of GEO-5

Action 2.2: Build solution-oriented, sustainability scenarios in member states

Objectives and Tasks

The objective of this Action is to assist member states in building sustainability scenarios in order to help them envisage a strategy for sustainable development. These scenarios will be built as part of the GEO-5 follow-up and as part of the Poverty and Environment Initiative and other ongoing activities. The main point of this Action will be capacity building.

a. GEO-5 Follow-up

One of the main thrusts of GEO-5 is to assist stakeholders in different regions in identifying policy actions for achieving international environmental goals and targets. As a follow-up to GEO-5, UNEP will help member states (in particular, national agencies and NGOs) to develop normative scenarios that lay out the steps for implementing the policy actions identified in GEO-5. These will be scenarios that explain how to sustainably manage water resources, forests, agriculture and other facets of the environment on the national or local level.

This work will be largely carried out by the Regional Offices of UNEP supported by the Scenario Team described in Action 2.3. DGEF can also be an important partner of this task.

b. Poverty and Environment Initiative (PEI)

Another component of this Action is to help member states (also national agencies and NGOs) build normative scenarios that provide a national and/or local vision of how to alleviate poverty and promote environmental sustainability. Depending on demand from member states, this effort could be an integral part of the Poverty and Environment

Initiative (PEI) and other one-UN activities and will allow member states to add scenario analysis to their procedures for national development planning. It will also be linked to the Millennium Ecosystem sub-global assessments and other UNEP-related activities.

UNEP Regional Offices will play a role in implementing this work, supported by the Scenario Team described in Action 2.3, with participation of DGEF.

Expected Products and Results

- Capacity building in member states on building solution-oriented, sustainability scenarios.
- New sustainability scenarios are produced at the national and local level as follow-up to GEO-5.
- New sustainability scenarios are produced at the national and local level to help implement the Poverty and Environment Initiative.

Action 2.3: Institutionalize scenario analysis at UNEP

Objectives and Tasks

The purpose of institutionalizing scenario analysis is to provide support for developing sustainability scenarios in UNEP projects (Action 2.1) and in member states (Action 2.2).

This Action involves the following:

- Establishing a *UNEP Scenarios Team* to provide scenario building support.

An important point here is continuity – It is important that a relatively stable group of internal and external experts work together to support UNEP-related scenario activities and develop a methodology that can be broadly used.

The Team will ...

- Provide training on scenario methodology
- Assist in planning scenario exercises
- Support running of scenario exercises
- Develop guidelines for developing qualitative storylines.
- Develop an external network of modelling teams to support the development of quantitative scenarios.

- Work with UNEP Collaborating Centres to set up the *first global clearinghouse of global and regional environmental scenarios*. This clearinghouse will be a valuable information source for developing countries interested in developing their own scenarios or for policy analysts interested in studying some aspect of the global environment. It will help UNEP become a major world centre for sustainability scenarios.

The Team will consist of ...

- one person each from DTIE, DEWA, DEPI, and possibly DGEF, DELC, and DCPI with 25% of their time committed to scenario-related activities, with initial support from the Chief Scientist
- 2 external consultants (total 0.5 person year / year)
- one person from DEWA, with 25% of his/her time committed as UNEP-wide focal point for scenario-related activities in the POW.
- the Chief Scientist will help initiate the team and be involved in the first phase of its work.

Expected Products and Results

- UNEP raises its profile in the UN community by becoming a main centre for developing and communicating visions of an environmentally sustainable world.
- UNEP sets up Scenario Team that effectively supports scenario-building within UNEP's POW and in member states.
- UNEP produces guidelines for qualitative scenarios.
- UNEP sets up the first clearinghouse of global and regional environmental scenarios.

Goal 3: Sustainability Science

Catalyzing needed science: UNEP takes a lead in formulating and advancing a worldwide sustainability science agenda that meets the critical needs of sustainable development with the "green economy" as a means to implement it.

Whereas the flow of information in Goals 1 and 2 is from science to policy, the flow is reversed in Goal 3. Here UNEP serves as a funnel for ideas from policymakers to scientists and actively influences the global science agenda. UNEP becomes a proponent of "sustainability science", defined in the Introduction as a problem-oriented, applied science that provides the scientific knowledge for enabling and advancing environmental sustainability.

In fulfilling this goal, UNEP will reach out to a new stakeholder group and user community – the science & research ministries of member states. UNEP will also play an increasingly important role in the global research landscape and becomes more energetic in convening the scientific community to support the climate and biodiversity negotiations.

Priority Actions for Goal 3

Action 3.1: Carry out "reverse" integrated assessments

Objectives and Tasks

The objective of this Action is to influence the global science agenda by carrying out "reverse integrated assessments". These are processes by which policymakers identify key questions from the policy arena that require scientific research, and then communicate these questions to the scientific community. These could be questions, for example about future climate impacts needed to select appropriate climate adaptation policies, or about scenarios of biodiversity needed to implement post-2010 biodiversity policy goals.

They are called “reverse integrated assessments” because the flow of information – from the policymaking community to the scientific community – is opposite to that of conventional integrated assessments.

These assessments consist of two sets of workshops. During the first set, policymakers and stakeholders identify key policy questions requiring scientific research. Such questions might have to do, for example, with the science behind the design of biodiversity conservation areas, or scientific information needed to decide on coastal adaptation to climate change, or the science behind averting impacts of extreme climate events. These are just a few examples of policy issues requiring better scientific understanding. At the second set of workshops, policymakers will convey these questions to the scientific community. These workshops will be aimed at a large external audience, and could be co-sponsored with scientific organizations such as the International Union of Science (ICSU) and/or the Earth System Science Partnership (ESSP).

These assessments will not be a “stand alone” activity of UNEP, but will be embedded into the various projects of the Programme of Work for 2010-11 and beyond. For example, they could be embedded (i) into the GEO process to provide new ideas on what future GEOs should cover; (ii) into the IPBES process to inform participants about the policy-relevant questions that IPBES should address; (iii) into the activities of the Resource Efficiency Panel of DTIE to inform panel members about key policy issues requiring their attention; (iv) or into the Millennium Ecosystem Assessment follow-up to identify research needs to support policies for ecosystem management.

Through these assessments UNEP will be able to greatly increase its influence over the scientific agenda, and in a way that furthers the needs of sustainable development and the green economy.

Expected Products and Results

- Semi-annual reports aimed at external audiences describing “Research needs for coping with urgent global change policy questions”. Findings from these reports will also be considered in the UNEP work programme planning processes (see also Foresight – Priority Action 1.2)

- High-level conference with national science & research ministries on “the sustainability research agenda for the next decade” (with UNESCO)
- Increased influence of UNEP on the global change science agenda
- A significant expansion of the science-policy arena in which UNEP operates

Action 3.2: Reach out to new stakeholder group – science & research ministries in member states

Objectives and Tasks

Up to now the key governmental stakeholder group of UNEP has been environment ministries. But the reverse integrated assessments described in Action 3.1 will produce outputs of interest to a new potential stakeholder group – *science and research ministries* in the member states.

These ministries are becoming increasingly important actors in the global sustainability landscape because they manage a large portfolio of applied research projects with many practical applications. By reaching out to these ministries UNEP will expand the size of the science-policy arena in which it operates and gain a new and important set of users of its output.

The objective of this Action is to make high-level contacts and begin working with science and research ministries in member states. The purpose of these contacts will be:

1. To launch a series of national-level “reverse integrated assessments”. These assessments will be co-organized by UNEP regional offices and science ministries. These assessments will serve as a platform through which national/local policymakers will be able convey research needs to their scientific community. This activity will contribute to capacity building because UNEP will train personnel from science ministries in developing countries to conduct reverse assessments.
2. To inform these ministries about UNEP’s scientifically-relevant outputs (e.g. emerging

issues, scenario results, and key policy issues requiring scientific research - see next point).

3. To organize new partnerships with these ministries in carrying out parts of UNEP's Programme of Work.

This Priority Action will be done in cooperation with UNESCO.

Expected Products and Results

- A series of national reverse integrated assessments in which UNEP plays an important role in helping policymakers in member states convey research needs to their scientific communities.
- New national partnerships in carrying out parts of UNEP's work programme.
- A significant expansion of the science-policy arena in which UNEP operates and a broader audience for UNEP's output.
- New recruitment pools for possible employment within UNEP.

Action 3.3: Play "honest broker" among scientific community in supporting the climate and biodiversity negotiations

Objectives and Tasks

UNEP is currently playing an "honest broker" role among scientists in connection with international climate negotiations. It has convened top scientific experts and is collecting their different views (and areas of agreement) about key questions concerned with the negotiations and conveying these views to policymakers. The questions are: What is the effectiveness of emission pledges given various loopholes? What are emission limits for staying within a 1.5° or 2.0° temperature target? What is the gap between emission pledges and limits? This information will be communicated to a wide audience of climate delegates and stakeholders, particularly from developing countries. In this way it increases the access of developing countries to important scientific information. This activity is embedded in other climate-related activities in DEPI, DELC, and DTIE.

Through the honest broker role UNEP takes advantage of its ability to convene the scientific community, and reinforces UNEP's unique place at the science-policy interface. It helps UNEP's fulfil its objective ...

"(to help) country policymakers and negotiators, civil society and the private sector (to) have access to relevant climate change science and information for decision-making." (Medium Term Strategy).

The purpose of this Action is to continue and expand the honest broker role of UNEP in the climate negotiations and extend it to biodiversity negotiations. Two main actions are proposed:

First, UNEP should move to the next phase of its honest broker role in the climate negotiations by convening the scientific community to estimate the potential of various mitigation measures to close the "emissions gap". This information would be very welcome by policymakers involved in the negotiations.

Second, UNEP should play a similar honest broker role in international biodiversity negotiations. It should do so by convening the scientific community to address the substantive and contentious scientific issues behind the post-2010 international biodiversity goals. The implementation of these goals is among the most important policy issues in the current biodiversity arena. Among the contentious issues: the threshold for "excess" nutrient pollution, the definition of "sustainable" management of agriculture and forests; the definition of subsidies "harmful to biodiversity". As honest broker of the scientific community UNEP could make a valuable contribution to achieving the post-2010 biodiversity goals.

Expected Products and Results

- Reports to policymakers on key issues about the "emissions gap"
- Report on key scientific issues behind post-2010 biodiversity goals.
- UNEP plays an honest broker role in the climate negotiations and helps satisfy its mission to provide access to climate change science and information for decision-making
- UNEP wins new standing as a key convener of the scientific community in addressing urgent policy questions in both the climate and biodiversity arenas.

Goal 4: Scientific Competence

Bolstering UNEP's scientific weight: UNEP equips itself scientifically to accomplish more at the science-policy interface

The main purpose of the Science Strategy is to strengthen the science base of UNEP, and to do so it is necessary to reinforce the scientific capabilities of its staff and associated institutions. Hence, this Goal has five Priority Actions. The first two are to improve the scientific aspects of UNEP assessments and UNEP publications, respectively. The third is to equip UNEP scientifically by building new strategic partnerships with science organizations. The fourth is to provide incentives to UNEP staff to become more engaged with the scientific community, and the fifth is to make the scientific input to its advisory committees more coherent. Collectively, these actions will yield more scientifically capable staff and institutions at UNEP.

Priority Actions for Goal 4

Action 4.1: Increase impact of UNEP scientific assessments

Objectives and Tasks

The Medium Term Strategy assigns a key role to UNEP's assessments by saying that

"Keeping the environment under review through scientifically credible monitoring and assessments is a foundation upon which UNEP will build to deliver on the Medium-term Strategy's six cross-cutting thematic priorities."

Although integrated assessment is a keystone of UNEP's work, it is still a relatively new methodology and its rigour can be improved. Furthermore, the current global assessment landscape is very complex, as seen by the proliferation of assessments at UNEP and elsewhere. The result is a bewildering cacophony of assessments of different sizes, shapes and methodologies, as shown in Annex II. On one hand, some of this diversity is justified because

assessments need to be tapered to a specific purpose. On the other, it also makes it difficult to compare assessments and learn from experience, to maintain quality control, and to decide on the type of assessment needed for a particular study. Hence, the purpose of this action is to improve the quality, and therefore the impact, of assessments through two approaches – improving their coherence and improving their scientific rigour.

a. Improving the coherence of UNEP assessments:

The coherence of assessments will be improved by developing a taxonomy of UNEP assessments. This taxonomy will specify objectives, styles and requirements of particular categories of assessments. Specifying objectives of particular categories will make their added value easier to understand.

The gain here will be:

- Easier selection of the appropriate assessment for the task at hand.
- Identification of benchmark and expectations for the assessment which makes quality control easier
- Easier presentation of UNEP's body of assessment work.
- Better comparability of assessment studies leads to learning by experience;
- Improvement of credibility of studies; and
- Capacity to draw on various assessments for higher level, synthetic assessments such as the GEO series.

b. Improving the scientific rigor of assessments:

Improving the scientific rigour of UNEP's assessments will involve two main tasks.

First, the application of a consistent and appropriate methodology to each category of assessment. It is clear that post-disaster-needs assessments and GEO assessments require different methodologies. The methodology should include: fixed categories of the environment to be assessed in each study; standardized indicators; and a fixed procedure for conducting the assessment.

The second task is to apply a consistent, rigorous and appropriate review process for each category of assessment. To improve credibility, UNEP

can co-organize these reviews with a reputable scientific network such as the Earth Systems Science Partnership (ESSP), or the Scientific Committee on Problems of the Environment (SCOPE).

The added value of improving the rigour of UNEP's assessments will be to:

- Enhance their credibility.
- Strengthen their objectivity.
- Help elevate the scientific reputation of UNEP.
- Make findings comparable between assessments which would help UNEP and others to improve the assessments and identify lessons transferable to other assessments.

Expected Products and Results

- Introduction of standardized methodologies for UNEP's different types of assessments boosting their credibility, learning effect and transferability.
- Better quality control of UNEP's assessments by categorizing them and applying appropriate quality control.

Action 4.2: Increase the impact of UNEP publications

Objectives and Tasks

Disseminating publications is a central way for UNEP to achieve its mission. Through publications it informs the world community about global environmental issues, assesses the state of knowledge, and makes the world community aware of policy options for dealing with environmental problems.

Currently not all publications are subject to formal scientific review, and there is a lack of consistent UNEP-wide procedures for scientific review when it is employed. Moreover, the scope of publications differs so much that it is difficult to identify the appropriate level of scientific control needed for a particular publication. Taken together these factors undermine the scientific credibility, and hence the impact, of UNEP publications.

The purpose of this action is to improve the credibility and impact of UNEP publications by improving their coherence and scientific rigour.

a. Improving the coherence of UNEP publications

A straightforward way of making UNEP publications more coherent is to sort them into a small number of understandable categories. For example they can be divided according to purpose or according to audience. The added value of this categorization is that it allows UNEP managers to judge the level of scientific content in the publication and hence the appropriate level of scientific control (see next point).

b. Improving scientific rigour through an appropriate level of scientific review

There are two simple strategies for enhancing the scientific rigour of UNEP publications and both will help increase their scientific quality, credibility, and objectivity.

First, guidelines and standards should be adopted and enforced for manuscripts, especially those with high scientific content. This includes guidelines for citations, for bibliographic referencing, for graphics and for other manuscript objects. The objectives of these guidelines and standards are to enhance the scientific objectivity and transparency of the work.

The second strategy is to ensure that publications receive a thorough and appropriate scientific review. We say "appropriate" because the type of review should depend on the category of publication; some categories will require stricter scientific control than others. Hence a specific review procedure will be assigned to a particular category or group of categories of publications. (The number of different procedures should be limited to two or three in order to avoid making the publication process too complicated.)

Although it is difficult to speculate on the details of the different review procedures before publications are categorized, we anticipate that each procedure will have some common elements:

- The number of reviewers will usually be 1 to 3 depending on the publication category.
- A procedure is needed to ensure that reviewer comments are taken into account.
- A set of rules must be agreed upon for signing off on manuscript revisions.

As in the case of assessments, UNEP could enhance the credibility of its scientific reviews by co-organizing them with a reputable scientific network such as the Earth Systems Science Partnership

(ESSP), or the Scientific Committee on Problems of the Environment (SCOPE).

c. Employ a Science Editor

A Science Editor is needed in DCPI to coordinate the scientific quality control of publications. The duties of this editor would be to:

- Work with an interdivisional task force, involving the Chief Scientist and Science Focal Points, to develop an appropriate categorization of publications, guidelines and standards for manuscripts, and scientific review procedures (points a and b above).
- Decide on the type of scientific review required for a particular publication.
- Organize the scientific review of particular publications.
- Ensure that comments from reviewers are incorporated into manuscripts.
- Ensure that formatting guidelines are complied with.
- Sign off on the scientific quality of the final publication.
- Work with other DCPI staff to ensure that appropriate UNEP publications reach wide audiences.

Expected Products and Results

- Introduction of UNEP-wide procedures for scientific review of publications
- Better quality control of UNEP's publications by categorizing them and applying appropriate scientific review procedures.
- Increased credibility of UNEP's publications
- Broader appeal of publications

Action 4.3: Establish new strategic scientific partnerships

Objectives and Tasks

UNEP is not a research institution, but achieves its scientific objectives through partnerships with networks (e.g. GCOS, GOOS, GTOS, African Association for Remote Sensing of the Environment), and collaboration centres (e.g. World Conservation Monitoring Centre), and by participating in intergovernmental processes (e.g. IPCC scoping meetings, the Science and Technical Advisory Panel of GEF).

Indeed, UNEP maintains its profile in the scientific community largely through partnering with science networks. Many of these partnerships will continue to be important for UNEP to achieve its objectives. However, with the refocusing of the organization along six new priority themes and its subsequent restructuring, UNEP also needs to develop new partnerships.

The purpose of this Action is to expand UNEP's current set of partnerships so that it can maintain access to the scientific knowledge needed to carry out its Programme of Work.

Considerations for new partnerships include:

- They provide expertise needed to fill knowledge gaps (e.g. social science networks, interdisciplinary sciences) or to deepen existing expertise (e.g. atmospheric sciences, science of chemicals in the environment).
- They provide access to a new users community for UNEP's work.
- They strengthen the credibility of UNEP activities e.g. assist in new procedures for reviewing UNEP's assessments and publications (see Actions 4.1 and 4.2).

a. High priorities for new partnerships

With the above considerations in mind, the following new partnerships would bring added value to achieving UNEP's POW and should be given priority by the relevant divisions.

- Establishment of a Programme of Research on Vulnerability, Impacts and Adaptation of Climate Change (PRO-VIA) which would provide an urgently needed platform for the research community to exchange knowledge, assemble findings, and identify gaps and research needs, and communicate these to policymakers. It will provide UNEP access to the scientific expertise needed to implement national plans for climate adaptation, and create a new important interface between the science and policy of climate change.
- Cooperation with the Earth Systems Science Partnership (ESSP) on the scientific review of UNEP products. The ESSP is the umbrella organization of the four principal global change research organizations (Diversitas, IGBP, IHDP, WCRP) and provides excellent access to the global change research community. It is proposed to begin the cooperation by co-

organizing the scientific review of GEO-5 with ESSP. Next steps could be to co-organize the scientific review of UNEP publications and assessments with ESSP.

- Cooperation with the International Council of Science (ICSU) and/or the Scientific Committee on Problems of the Environment (SCOPE) for identifying emerging issues. It is proposed to broaden UNEP's ongoing cooperation with these organizations to include their participation in the UNEP Foresight Process for identifying and ranking emerging issues and communicating these issues to stakeholders. (Action 1.2)
- b. Other partnerships for consideration

Apart from the above list, there are many other partnerships worth considering by pertinent divisions or subprogrammes. The following is a short list of options according to subprogramme:

- Ecosystems Management: UNEP's support of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) opens the door to strengthening partnerships with science networks such as ESSP/Diversitas,
- Harmful Substances and Hazardous Wastes (Chemicals): Potential partners for capacity building in data and indicators and science gaps for chemicals include the Society for environmental toxicology and chemistry (SETAC) and the Environmental Health and safety Programme of the OECD. Examples for partnerships at the national level include the National Environmental Assessment Bureau of the Netherlands (PBL).
- Disasters & Conflicts: Potential partners include the Integrated Research on Disaster Risk (IRDR) of the International Union of Science (ICSU)
- Resource Efficiency and Clean Technology: New partnerships initiated by DTIE/RISOE for Energy assessments include the US National Renewable Energy Laboratory, Clean Network (UNEP, UNDP, UNIDO, others), ECN (Netherlands), in addition to traditional partners such as TERI.
- Climate Change: Potential partners include the International Institute of Applied Systems Analysis regarding new approaches to mitigation of climate change and the honest

broker role among scientists in the climate negotiations (Action 3.4); and the Energy Modelling Forum concerning costs of mitigation options; and the START secretariat on capacity building in the area of climate change mitigation and adaptation

- Environmental Governance: new regional partnerships will be needed to identify policy solutions to speed up realization of internationally agreed environmental goals.

Expected Products and Results

- Expanded access to scientific expertise needed to carry out Programme of Work.
- UNEP raises profile in scientific community by becoming a major partner in joint activities with scientific networks.
- UNEP recognized by scientific community as major useful partner by serving as conduit to policymaking community
- Strengthened review process of UNEP's products and, hence, increased credibility of these products.

Action 4.4: Strengthen scientific competence of UNEP staff by providing goals and incentives

Objectives and Tasks

The purpose of this action is to encourage a core number of UNEP staff to make the necessary effort to maintain and deepen their scientific competence so that they can successfully carry out their work at the science-policy interface and serve at the forefront of increasing the role of science in UNEP's POW. To do so, the following is proposed:

- Improve access of staff to scientific publications through an on-line system such as "OARE" (Online Access to Research in the Environment).⁸
- Provide incentives and/or targets for publication, participation in scientific committees, presentations at conferences, and overall stronger involvement of UNEP staff in scientific community.

⁸ OARE is an international public-private consortium coordinated by the United Nations Environment Programme (UNEP), Yale University, and leading science and technology publishers enables developing countries to gain access to one of the world's largest collections of environmental science research. To-date over 2000 environmental institutions in developing countries have access to over 3400 peer-reviewed scientific journals

- Realign ePAS to incorporate achievement of scientific goals.
- Review current vacancies to strengthen scientific capacity at UNEP. Add scientific qualifications to limited number of vacancies per subprogramme per division.
- Consider allotting time explicitly within each division for science-related activities to strengthen the scientific competence of staff. One model – the “20% - 25% principle”: one in five professional staff are encouraged to spend one-quarter of their time on engaging with the scientific community through participation in scientific committees, presentations at conferences, preparation of publications and similar activities.
- Can UNEP divisions provide more scientific input to these committees?
- How can the scientific committees best take advantage of the Priority Actions of the Science Strategy, e.g. the identification of emerging issues through the Foresight Process, the setting of research agendas through reverse integrated assessments, and the analysis of policy options through sustainability scenarios?

The purpose of this Action is to improve the coherence by which science is used in the various scientific advisory committees in the UNEP family.

To do so the following steps will be taken through the UNEP divisions:

Expected Products and Results

- Increased capability of staff to stay current with latest scientific information and methods.
- Enhanced capability of staff to apply scientific information and methods to Programme of Work.
- Improved retention of staff with good scientific qualifications.

Action 4.5: Improve the coherence of inputs to UNEP science committees

Objectives and Tasks

UNEP faces the task of sharing knowledge in a coordinated manner among a wide range of science advisory committees associated with the greater UNEP family – These include the various scientific committees of the multilateral environment agreements as well as the GEF Science and Technology Panel and the Resource Efficiency Panel of DTIE (Table 1). Up to now these different committees have grown “organically” to meet the needs of their parent institutions. While this makes sense, it is also believed that they have not taken full advantage of the scientific knowledge and networks available through the UNEP family. Key questions are:

- Can some scientific input be shared among the committees?

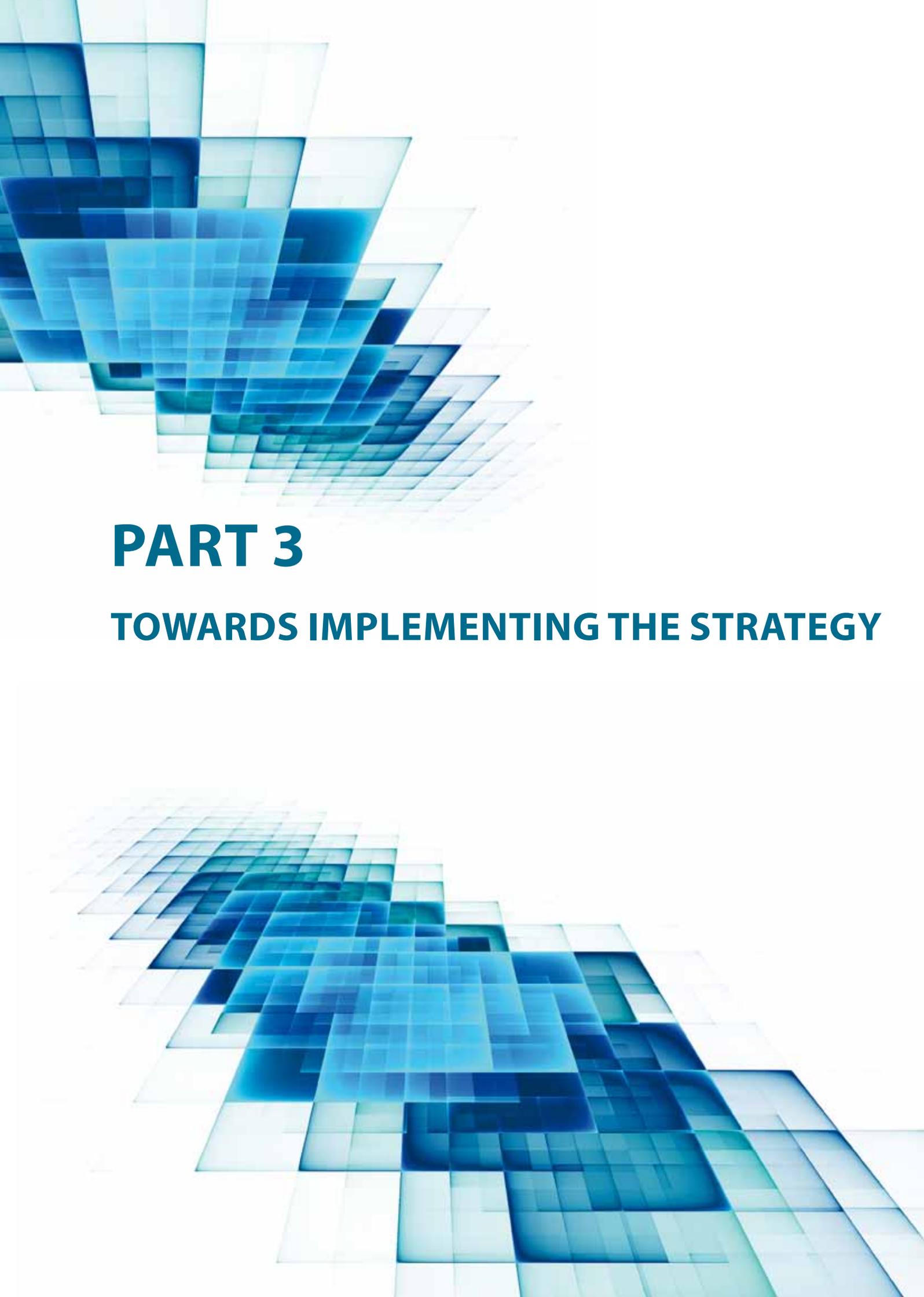
1. All scientific advisory committees in the UNEP family will be surveyed to determine the kind of scientific input delivered to these committees, the source of this input and the method by which it is delivered.
2. Members of the committees and their parent institutions will be interviewed to determine the needs for new scientific inputs.
3. The scientific committees will be compared to identify potential synergies in sharing scientific knowledge.
4. A strategy for harmonizing and enhancing scientific input to these committees will be prepared.

Expected Products and Results

- An assessment of how scientific knowledge is used by the various science advisory committees in the UNEP family.
- A strategy for sharing scientific knowledge and inputs among the various science advisory committees in the UNEP family.
- UNEP increases its input to the science panels of various multilateral environmental institutions and thereby increases its influence on their programming activities.

Table 1. Scientific advisory committees in UNEP family

UNEP-related Institution	Scientific Advisory Committee	Role of Committee
Secretariat to the Convention on the Conservation of Migratory Species of Wild Animals (CMS)	Scientific Council	Makes recommendations to COP on such issues as research on migratory species, specific conservation and management measures, the inclusion of migratory species in the Appendices and designation of species for Concerted or Cooperative Actions under the Convention. Gives advice on projects' eligibility for funding under the Small Grant Programme of CMS.
Secretariat of the Convention on Biological Diversity (CBD)	Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA)	Provides assessments of the status of biological diversity and types of measures taken in accordance with the provisions of the Convention. Responds to questions from COP.
Secretariat to the Convention on International Trade in Endangered species of Wild Fauna and Flora (CITES)	Animals and Plants Committees	To fill gaps in knowledge regarding species of animals and plants that are (or might become) subject to CITES trade controls. Provide scientific advice and guidance to COP, working groups and Secretariat. Undertake periodic reviews of species. Advise when certain species are subject to unsustainable trade and recommend action. Draft resolutions on animal and plant matters for consideration by COP.
Secretariat of the Basel Convention (SBC)	Technical Working Group	To elaborate 'Technical Guidelines' for Environmentally Sound Management of Wastes subject to the Basel Convention.
Ozone Secretariat (Protection of the Ozone Layer)	Assessment Panels for Scientific, Environmental, Technology, and Economic Assessments	Scientific Assessment Panel assesses status of and other scientific aspects of ozone layer depletion. Technology and Economic Assessment Panel (TEAP) provides technical information related to alternative technologies to eliminate use of Ozone Depleting substances (CFCs, Halons etc), that harm the ozone layer. The Environmental Effects Assessment Panel assesses various effects of ozone layer depletion.
The Stockholm & Rotterdam Conventions	Chemicals Review Committee	Makes recommendations on the inclusion of banned or severely restricted chemicals, on the inclusion of hazardous pesticide formulations. Prepares draft decision guidance documents for chemicals. Makes recommendations on removal of chemicals and revision of decision guidance documents.
African-Eurasian Waterbirds Agreement (AEWA)	Technical Committee	Makes recommendations to Meetings of the Parties (MOP) concerning Action Plan, implementation of Agreement and research. Prepares a report on its activities. Carries out other tasks from MOP.
Scientific and Technical Advisory Panel (STAP) of Global Environment Facility (GEF)	Scientific and Technical Advisory Panel	Provides scientific advice to GEF and reviews scientific quality of GEF proposals.
International Panel for Sustainable Resource Management	International Panel for Sustainable Resource Management	Provides scientific assessments of policy relevance on the sustainable use of natural resources and their environmental impacts over the full life cycle. Contributes to a better understanding of how to decouple economic growth from environmental degradation.
United Nations Framework Convention on Climate Change (UNFCCC)	Subsidiary Body for Scientific and Technological Advice (SBSTA)	Regularly undertakes work on methodological and scientific matters as they relate to the Convention and the Kyoto Protocol process.
United Nations Secretariat of the Convention to Combat Desertification (UNCCD)	Committee on Science and Technology	Collects, analyses and reviews relevant data. Promotes cooperation in the field of combating desertification and mitigating the effects of drought through appropriate sub-regional, regional and national institutions, and in particular by its activities in research and development, which contribute to increased knowledge of the processes leading to desertification and drought as well as their impact.
Ramsar Convention on Wetlands	Scientific and Technical Review Panel (STRP)	Provides scientific and technical guidance to the Conference of the Parties, the Standing Committee, and the Ramsar Secretariat.

An abstract graphic design featuring a grid of semi-transparent blue squares. The squares are arranged in a way that creates a sense of depth and movement, with some squares appearing to be in the foreground and others receding into the background. The colors range from light, airy blues to deep, rich blues. The overall effect is modern and technological.

PART 3

TOWARDS IMPLEMENTING THE STRATEGY

TOWARDS IMPLEMENTING THE STRATEGY

Here we present an initial scoping of the implementation of the Strategy rather than a complete plan. The Strategy will be implemented in a decentralized fashion, with the aim to integrate most Priority Actions into the existing and planned Programme of Work of UNEP divisions. Table 2 provides a preliminary outline of responsibilities for implementing the Strategy.

The role of various groups in implementing the Strategy:

- a. Divisions and subprogrammes will integrate most components of the Strategy into their Programme of Work.
 - b. The Chief Scientist's Office, supported by DEWA will:
 - c. The Science Focal Points will:
 - Convene regularly under the chairmanship of the Chief Scientist and provide advice on implementation of different Priority Actions.
 - As part of the Foresight Process, be responsible for canvassing their divisions about emerging issues. (see Action 1.2)
 - Participate in Task Forces on increasing the impact of UNEP assessments and publications.
- Act as a catalyst of Priority Actions by working with the divisions and subprogrammes to incorporate Priority Actions into their Programme of Work.
 - In some cases, lead the first phases of Priority Actions, e.g. coordinate the first Foresight Exercise, and lead various temporary Task Forces (e.g. the Task Force on increasing the impact of UNEP assessments.)
 - In a few cases, provide ongoing leadership of some aspects of the Strategy, e.g. by chairing the ongoing Group of Science Focal Points.

Table 2: Provisional list of responsibilities for implementing First Phase of Science Strategy, 2010-11. This document tabled at Senior Management Team meeting, November, 2010.

Goals and Actions from Science Strategy	Tasks by Division
Goal 1. Emerging Issues Action 1.1 Implement a Global Environmental Alert Service	DCPI: Review of bulletins for quality control, publish bulletins on UNEP website. DELC: Science Focal Point provides possible inputs for bulletins. DEPI: Science Focal Point provides possible inputs for bulletins, role of user of bulletins for possible priority setting. DEWA: GEAS coordination -- lead role in pulling bulletin information together from across divisions and publishing, establishing conduit from GEAS bulletins into foresight process (see Action 1.2), and producing bulletins. DGEF: Role as user of bulletins for possible priority settings. DRC: Science Focal Point provides possible inputs for bulletins, especially for regions. DTIE: Science Focal Point provides possible inputs for bulletins, role of user of bulletins for possible priority setting.
Goal 1. Emerging Issues Action 1.2 Establish a UNEP-sponsored Foresight Process	DCPI: Assist in design of web service. DELC: Through Science Focal Point, provide views on emerging issues in first phase of foresight process, as well as other inputs. DEPI: Through Science Focal Point, provide views on emerging issues in first phase of foresight process, as well as other inputs. DEWA: Management of foresight process. DGEF: Through Science Focal Point, provide views on emerging issues in first phase of foresight process, as well as other inputs; assist in integrating results of foresight process into GEF programming (STAP). DRC: Through Science Focal Point, provide views on emerging issues in first phase of foresight process, as well as other inputs. DTIE: Through Science Focal Point, provide views on emerging issues in first phase of foresight process, as well as other inputs. Chief Scientist: Chair of scientific committee during first foresight exercise.

Goals and Actions from Science Strategy	Tasks by Division
Goal 2. Sustainability Scenarios Action 2.1 Build solution-oriented, sustainability scenarios as part of UNEP projects	DELC: Participate in Science Focal Point meetings, as needed. DEPI: Build scenarios as part of REDD activities. DEWA: Build scenarios as part of GEO-5 report. DTIE: Build scenarios of the world mineral economy as part of the Resource Efficiency Panel. Chief Scientist: Provide technical advice to scenario building efforts.
Goal 2. Sustainability Scenarios Action 2.2 Build solution-oriented, sustainability scenarios in member states	DEPI: Science Focal Point helps prepare plan for integrating scenario analysis into PEI activities at country/regional level. DEWA: GEO-5 team works with regional science contacts to incorporate scenario analysis in GEO-5 follow-up; in particular scenarios for implementing local/regional policies to meet global targets. DGEF: Role in integrating sustainability scenarios into project work to be implemented within countries. DRC: Science Focal Point helps prepare plan for integrating scenario analysis into PEI and GEO follow-up at country/regional level. DTIE: Role in integrating sustainability scenarios into project work to be implemented within countries.
Goal 2. Sustainability Scenarios Action 2.3 Institutionalize scenario analysis at UNEP	DEPI: Part-time of one person serves on UNEP-wide Scenario Team. DEWA: Part-time of one person serves on UNEP-wide Scenario Team. DGEF: Draw on expertise of Scenario Team in project development. DRC: Lead political and administrative liaison in targeted countries DTIE: Part-time of one person serves on UNEP-wide Scenario Team. DCPI: Part-time of one person serves on UNEP-wide Scenario Team. Chief Scientist: Home of interdivisional Scenario Team; planning Scenario Team; design sustainability scenarios approach to UNEP's POW.
Goal 3. Global Sustainability Science Action 3.1 UNEP carries out "reverse" integrated assessments	DELC: Contribute to selection of topics for reverse assessments. DEPI: Build into the IPBES process to identify research needs to support policies for ecosystem management; contribute to selection of topics for reverse assessments. DEWA: Build into GEO process to provide new ideas on what future GEOs should cover; contribute to selection of topics for reverse assessments; build into identification of research issues through PRO-VIA. DTIE: Build into Resource Efficiency Panel assessments to inform panel members about key policy issues requiring their attention; contribute to selection of topics for reverse assessments. Chief Scientist: Working with the divisions, establish guidelines for conducting reverse assessments; catalyze reverse assessments during first two years.
Goal 3. Global Sustainability Science Action 3.2 UNEP reaches out to new stakeholder group – science & research ministries in member states	DEPI, DEWA, DGEF, DRC, DTIE: Invite science/research ministries to participate in project design, development and execution; carry out reverse assessments with science/research ministries. Chief Scientist: Identify new partnerships with Sci&Research ministries.
Goal 3. Global Sustainability Science Action 3.3 Play "honest broker" among scientific community in supporting the climate and biodiversity negotiations	DCPI: Assist in outreach functions for new products. DELC: Expand honest broker role for scientific community regarding climate negotiations. DEPI: Engage in honest broker role for scientific community regarding post-2010 biodiversity goals. DEWA: Expand honest broker role for scientific community regarding climate negotiations. DTIE: Expand honest broker role for scientific community regarding climate negotiations. Chief Scientist: Catalyze and supports honest broker role for scientific community regarding climate negotiations and post-2010 biodiversity goals.
Goal 4. Scientific Competence Action 4.1 Increase impact of UNEP scientific assessments by improving the coherence scientific rigor of these assessments	Interdivisional Task Force on Publications: Chief Scientist and Chief of Scientific Assessment Branch of DEWA co-chair interdivisional task force of Science Focal Points to develop new guidelines and policies for UNEP assessments as described in Action 4.1 DCPI: Science Focal Point participates in Task Force DEPI: Science Focal Point participates in Task Force DEWA: Science Focal Point participates in Task Force DTIE: Science Focal Point participates in Task Force DGEF: Science Focal Point participates in Task Force DRC: Science Focal Point participates in Task Force

Goals and Actions from Science Strategy	Tasks by Division
<p>Goal 4. Scientific Competence Action 4.2 Increase the impact of UNEP publications by improving their scientific rigor</p>	<p>DCPI : Recruitment of Science Editor, role in developing guidelines.</p> <p>Interdivisional Task Force on Assessments: Chief Scientist and Science Editor co-chair task force of Science Focal Points to develop new guidelines and policies for UNEP publications as described in Action 4.2</p> <p>DCPI: Science Focal Point participates in Task Force DEPI: Science Focal Point participates in Task Force DEWA: Science Focal Point participates in Task Force DTIE: Science Focal Point participates in Task Force DGEF: Science Focal Point participates in Task Force DRC: Science Focal Point participates in Task Force</p>
<p>Goal 4. Scientific Competence Action 4.3 Establish new scientific partnerships</p>	<p>DELC: Developing new scientific partnerships, e.g. in connection with environmental governance and other topics. DEPI: Developing new scientific partnerships, e.g. in connection with disasters and conflicts and other topics. DEWA: Providing support for PRO-VIA (Programme of Research on Vulnerability, Impacts and Adaptation of Climate Change) in its first phase. Cooperation with the Earth Systems Science Partnership (ESSP) on the scientific review of UNEP products, in particular GEO-5. Build on GEO-5 collaborating center network to extend to potential new partners in economics, etc. DGEF: User of partnership services in project design and development. DRC: Facilitate partnerships in developing countries. DTIE: Providing support for PRO-VIA (Programme of Research on Vulnerability, Impacts and Adaptation of Climate Change) in its first phase. Developing other scientific partnerships, e.g. in connection with climate change, resource efficiency and other topics. Chief Scientist: Providing support for PRO-VIA (Programme of Research on Vulnerability, Impacts and Adaptation of Climate Change) in its first phase; Cooperation with the Earth Systems Science Partnership (ESSP) on the scientific review of UNEP products, in particular GEO-5.</p>
<p>Goal 4. Scientific Competence Action 4.4 Strengthen scientific competence of staff by providing goals and incentives for them to engage with the scientific community</p>	<p>Interdivisional Task Force on Increasing Scientific Capacity: Chief Scientist chairs task force of Science Focal Points to develop plan for implementing Action 4.4, to be approved by SMT.</p> <p>DCPI, DEPI, DEWA, DTIE, DGEF, DRC: Science Focal Points participate in Task Force.</p>



ANNEXES

Annex I: Current (2010-11) science-related activities at UNEP

Sub-programme	Scope of Science	Focus of UNEP's interventions	Partners
Disasters and conflicts	Improving the understanding of environmental risks and vulnerabilities in disaster risk reduction and post-conflict response and providing early warning to minimize the adverse effects of disaster and conflict on human life and the environment and integrating environmental considerations into recovery programmes to minimize the negative impact of such events on degraded environments.	<ul style="list-style-type: none"> • Provide early warning on environmental risks, environmental data and expertise on sustainable management of trans-boundary and shared natural resources related to relevant initiatives led by the United Nations; • Assess vulnerabilities and risks of critical ecosystems and communities to help to integrate the findings into national decision-making, planning and preparedness and recovery practices – including science-based rapid assessments; • Consolidate methodologies on post-conflict and disaster management, including documenting them, managing and sharing knowledge, and providing training for experts both within and outside UNEP; • Development of theoretical frameworks and establishing academic linkages for post-conflict and disaster management; • Contribute to global policy development by mainstreaming environmental lessons learned and best practices into relevant conflict and disaster policy and planning processes at the global level. 	<ul style="list-style-type: none"> • European Commission Joint Research Center, Regional Disaster Information Center (CRID), Asian disaster Preparedness Centre (ADPC), Disasters group of the Global Earth Observing System of Systems (GEOSS); • University of Geneva, University of Maryland-Department of Geography and Earth System Interdisciplinary Center, WWF Humanitarian Partnership Programme, University of the West Indies-Jamaica, University of Columbia-Earth Institute; • ReliefWeb, national Inter-governmental mechanisms, UN agencies and programmes: OCHA, Inter-Agency Standing Committee (IASC), International Strategy for Disaster Reduction (ISDR), International Federation of the Red Cross and Red Crescent Societies; • UNEP-WCMC and GRID centres in Geneva, Sioux Falls and Nairobi, UN Institute for Training and Research (UNITAR)–Operational Satellite Applications Programme (UNOSAT), IUCN.
Sub-programme	Scope of Science	Focus of UNEP's interventions	Partners
Ecosystem management	To improve the scientific understanding of direct and indirect drivers of ecosystem change that affect ecosystem functioning and the services they deliver (in priority ecosystems), and their implications for human well-being, and their inter-linkages, and to transform that understanding into policy setting and implementation tools (science-policy interface).	<ul style="list-style-type: none"> • Highest priority for intervention is in six ecosystems: climate regulation, water regulation, natural hazard regulation, energy, freshwater and nutrient cycling. • Another five were identified at a second tier of priority: water purification and waste treatment, disease regulation, capture fisheries, primary production and recreation and ecotourism. <ul style="list-style-type: none"> - Assessment and monitoring in priority ecosystems (e.g., indicators, research and access to knowledge) – including development of methodologies, baseline data for ecosystem status; - Capacity-building and Technology Support for assessments, monitoring and early warning (e.g. national level capacity for assessing biodiversity critical to ecosystem functioning and resilience; coastal and marine ecosystems) to support mainstreaming of the ecosystem approach in development planning processes. - Risk management; - Management Tools (e.g., conservation/protection, restoration, sustainable management – scientific validation of tools) - Ecosystem economics (e.g. payments for ecosystem services, incentives and financing mechanisms, valuation, equity and fairness principles). 	<ul style="list-style-type: none"> • IUCN, WWF, the Nature Conservancy, the World Resources Institute, the CGIAR, IPCC, the Inter-Governmental Science-Policy Platform on Biodiversity and Ecosystems Services and Issue-Based Modules for Coherent Implementation of Biodiversity Related Conventions. • Universities, relevant research centres, SwedBio, national research councils. • Scientific and technical panels of the global Earth observing systems: GTOS and GOOS (Global Terrestrial and Ocean observing systems); Global Earth Observing System of Systems' Ecosystems, Biodiversity and Water groups; • Scientific and technical panels of the UN agencies and programmes and multilateral agreements (e.g. MEA SBSTTA, UNESCO's International Hydrology Programme, Man and the Biosphere Programme, Intergovernmental Oceanographic Commission; Convention on Biological Diversity, Ramsar Convention Scientific and Technical Review Panel (STRP), FAO's Scientific Advisory Committee and relevant subsidiary bodies. • UNEP centres and collaborating centres: UNEP-WCMC, UNEP/Danish Hydraulics Institute Centre for Water and Environment and UNEP/Risoe Centre on Energy and Climate • Conservation of Migratory Species of Wild Animals (CMS), the Convention on the International Trade in Wild Species of Flora and Fauna (CITES), the Convention on Wetlands of International Importance, Particularly as Wildfowl Habitat, the regional seas conventions, the Framework Convention on Climate Change and the Desertification Convention.

Sub-programme	Scope of Science	Focus of UNEP's interventions	Partners
Environmental Governance	To strengthen the scientific base for environmental governance to keep the state of the environment under review on a regular basis through authoritative assessment processes and identification of emerging issues in order to support sound science based decision-making at the national and international level.	<ul style="list-style-type: none"> • Produce assessment reports and summaries on important and emerging environmental issues to the Governing Council and other governmental and intergovernmental bodies. • Develop coherent assessment and reporting network from the global to the national level. • Technical cooperation to support developing countries in addressing the environment at the national and regional levels including support Governments to develop, and strengthen their capacity for environmental data and knowledge management (and access to information) and assessment. • Strengthening of partnerships with Governments and relevant organizations, including universities and research institutions to facilitate wider appreciation of the existing internationally agreed environmental objectives and develop capacities in environmental science, monitoring, assessments and reporting through training and education. 	<ul style="list-style-type: none"> • Scientific bodies of the MEAs e.g. UNFCCC, CBD, Basel, Rotterdam and Stockholm Conventions; • Network for Environment and Sustainable Development in Africa, CEDARE, ILRI, WRC, Indian Ocean Commissions, IOC-UNESCO, IIASA, FAO, ISRIC, GEOSS, IMAE, CEUTA, CIESIN, WRI, START, SCOPE; • UNDP Human Development Report group, GEF-STAP; • International and regional organizations e.g. SPREP; • Universities and research institutions in developing countries and CEITs (including GEO collaborating centres), UNEP collaborating centres of excellence; • Group of environmental scientists (individual scientists), Earth observation and environmental data experts, expert communities and resources of Global Earth Observing Systems and processes; • Chief Executives Board (CEB), Environmental Management Group (EMG), UN Development Group (UNDG), scientists and experts of the UN Country teams, Commission on Sustainable Development.
Sub-programme	Scope of Science	Focus of UNEP's interventions	Partners
Resource Efficiency	To strengthen the scientific and knowledge base for designing policies, frameworks and tools which promote RE and reduce impacts of consumption and production, especially with respect to the full life cycle of products.	<ul style="list-style-type: none"> • To develop a systematic approach towards monitoring driving forces as well as applying impact assessment methodologies and criteria for selecting specific products, sectors and resource flows. • Identification of emerging trends and early warning on topics linked to RE-SCP (e.g. biofuels, land use/land change, food security) • Assessments to identify areas where resource scarcity is becoming severe and where efficiency gains, recycling and restoration opportunities exist. • Scientific assessments on the sustainable use of resources over the product life cycle, including information about the availability of supplies, extraction processes, and the environmental impacts of selected goods and services (including support to the International Panel for Sustainable Resource Management and the related International Life Cycle Panel. 	<ul style="list-style-type: none"> • Scientific and technical partners of UNEP's International Panel for Sustainable Resource Management and International Life Cycle Panel; • UNEP RISOE Centre on Energy, Climate and Sustainable Development, Swiss Federal Institute of Technology (ETH-Z); • UNIDO-UNEP National Cleaner Production Centres (NCPCs); • UNEP/Wuppertal Institute - Centre on Sustainable Consumption and Production; • Global Reporting Initiative; • the Energy and Resources Institute (TERI), the University of the West Indies (Energy Department); • Scientific data/indicator support centres and networks: GRID centres, UNEP-WCMC.

Sub-programme	Scope of Science	Focus of UNEP's interventions	Partners
Harmful Substances and Hazardous Waste	Sound science to support global assessments, early warning and monitoring of chemicals of concern, to support the development of policy frameworks (legal or voluntary).	<ul style="list-style-type: none"> • Improve knowledge of chemical's use, trading release, transport (environmental and trade), and fate (e.g. POPs, Hg, Pb and Cd assessments) • Provide technical and scientific advice on substitution of harmful substances with alternative methods and chemicals; • Identification, compilation and provision of best available techniques and best environmental practices (including development of guidelines) regarding the management and disposal of harmful substances and hazardous waste; • Collection and analysis of scientific data for assessment and management of harmful substances and hazardous waste at national and regional level, including the wider socio-economic cost; • Develop regional specific early warning and policy advice based on sound science; • Facilitate de scientific knowledge and analytical capacity to manage wastes in an environmentally sound manner, and to support improved controls of trans-boundary movements of harmful substances and hazardous waste. 	<ul style="list-style-type: none"> • The International Council of Science (ICSU), the Scientific Committee on Oceanic Research (SCOR); • Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), UNEP's Global Programme of Action; • ICSU-Scientific Committee on Problems of the Environment (SCOPE); • Scientific bodies of the chemical MEAs.

Annex II: Landscape of ongoing assessments with UNEP's participation *(updated 04 August 2010)*

	Millennium Ecosystem Assessment (MA) follow-up strategy	Global Environment Outlook (GEO)	Regular Process for Assessment of the Marine Environment (GRAMÉ)	International Panel for Sustainable Resource Management	Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)
Scope	Sub-global assessments. Translate findings to policy by building capacities at national level to undertake assessments, economic valuation and trade-off analysis.	Integrated environmental assessments, with analysis of state and trends of the environment (global and sub-global levels) and an outlook component for scenarios of major environmental issues for possible policy options.	Global reporting and assessment of the marine environment, including socio-economic aspects, both current and foreseeable.	Scientific assessments of environmental and socio-economic impacts of global resource use; Policy neutral advice for sustainable resource management.	Scientific assessment of state and trends of biodiversity and impacts on ecosystem services, with capacity building element.
Scientific independence	Credible (peer reviewed) Legitimate (multi-stakeholder) Governance structure (under UNEP).	Relevant (Upon request by UNEP GC) Credible (peer reviewed) Legitimate (Intergovernmental and multi-stakeholder) Governance structure (under UNEP).	Relevant (Upon request by UN GA) Credible (peer reviewed) Legitimate (Intergovernmental and multi-stakeholder).	Relevant (Steering Committee). Credible: (targeted peer review). Legitimate (Intergovernmental and multi-stakeholder) Governance structure (under UNEP).	Follows IPCC model (proposed). Highly relevant and credible. Governance structure (tbd). Legitimate: Intergovernmental (Multistakeholder – tbd)S), with capacity building element. of biodiversity and impacts on ecosystem.
Common and shared knowledge base	Limited to partners of the MA-follow-up.	Limited to GEO regional and thematic collaborating centres.	[WG recommended to consider issue in 2010].	Limited to resource use by economic sectors.	Follows IPCC model (proposed). If GA approved, will be decided in first plenary.
Regular and timely assessments	Sub-Global assessments (ad hoc).	Global (every five years); Regional, sub-regional, national, sub-national and thematic assessments (ad hoc).	Provide regular assessments at global and supra-regional levels including cross-cutting thematic issues.	Assessments undertaken at the sectoral level (ad hoc).	Follows IPCC model (proposed). If GA approved, will be decided in first plenary.
Support policy implementation	UNEP to use results through country level PEI mainstreaming processes.	UNEP GC, regional environmental fora, national environmental legislation, priority setting.	Reports to the UN GA. Will support decision-making by States and relevant regional and international organizations.	Findings of the assessment feed into resource efficiency policy making.	Follows IPCC model (proposed), with primary focus on scientific assessments.
Capacity building	Funds national capacity-building through PEI processes.	Integrated environmental assessment Training Package support sub-global capacity building coordinated through UNEP Regional Offices.	GRAMÉ to promote capacity building and transfer of technology for developing States.	Creates opportunities for capacity building.	Departs from IPCC model with proposed strong component on capacity building.



www.unep.org

United Nations Environment Programme
P.O. Box 30552 - 00100 Nairobi, Kenya
Tel.: +254 20 762 1234
Fax: +254 20 762 3927
e-mail: uneppub@unep.org
www.unep.org

