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UNEP Ecosystem Management Programme:

An Ecosystem Approach

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Executive summary

1. The Millennium Ecosystem Assessment analysed 24 ecosystem services – the benefits that people obtain from functioning ecosystems – and found that 15 were in global decline. Humans depend on ecosystem services for many aspects of their well-being (including food, water, health, security and others). The decline in services affects the world's disadvantaged people most strongly, but it also impedes sustainable development globally and, in developing countries, obstructs attainment of the Millennium Development Goals.

2. Responses so far, targeting specific sectors, such as water, agriculture and forests, rather than spatial units of functionally interdependent ecosystems and valuing certain services, such as food and hardwood, while ignoring others notably air quality regulation, water purification and pollination, have largely failed to arrest or reverse the decline in ecosystem service delivery. Ecosystem management, on the other hand, by taking a more holistic view of the links between ecosystem service delivery and human well being, is expected to provide a more effective response.

3. One of the six priorities of the UNEP medium-term strategy for 2010–2013 is that “countries utilize the ecosystem approach to enhance human well-being”. Centred on the functioning and resilience of the ecosystems that provide services and equitable access to these services, the UNEP ecosystem management programme endeavours to operationalize the ecosystem approach, with a view to accomplishing the following:

- (a) Countries and regions increasingly integrate an ecosystem management approach into development and planning processes;
- (b) Countries and regions acquire the capacity to use ecosystem management tools; and
- (c) Countries and regions begin to realign their environmental programmes and financing to tackle the degradation of selected priority ecosystem services.

4. The ecosystem management programme is guided by a conceptual framework that has five major interlinked elements: human well-being, indirect and direct drivers of change, ecosystem functioning and ecosystem services. Changes in ecosystem functioning can positively or negatively affect the delivery of ecosystem services. In order to identify entry points for effective interventions it is necessary to understand which direct drivers (e.g., land-use change, invasive species) and which indirect – and more diffuse – drivers (e.g., demography) are affecting ecosystem functioning and how modifying the delivery of ecosystem services can directly affect the various constituents of human well-being.

5. This analysis needs to be carried out on a variety of different scales (local, regional, global) and should differentiate between stakeholders in order to ensure equitable access to ecosystem services. Decisions on the different options for ecosystem use require a trade-off, which takes due account of the relative benefits of all the services for the various dimensions of well-being across the entire stakeholder landscape.

6. Given the mandate conferred upon UNEP, its convening power, its potential to engage with different stakeholders around commonly identified approaches and its capacity to transform these into policy-setting and implementation tools, the ecosystem management programme can be expected to influence development thinking and build capacity for the mainstreaming of the ecosystem approach in development planning. Experience gained by UNEP in the use of integrated management approaches, most often in partnership with other organizations, is a source of additional strength.

7. Given the extent to which ecosystems have become degraded and the implications of that degradation for well-being and sustainable development, in combination with the UNEP mandate and its comparative advantage and partnership potential, 11 of the 15 degraded ecosystem services were considered most relevant and need to be addressed as a priority under the ecosystem management programme. These mainly comprise regulating services (climate, water, natural hazard and disease regulation, water purification and waste treatment), often strongly affected by the overuse of provisioning services. Other United Nations agencies have specific mandates for the main provisioning services but freshwater, energy (especially the emerging issues around biofuel production) and capture fisheries were selected as key services to be targeted by the ecosystem management programme. Of the cultural services, only the recreation and ecotourism service was selected, while, of the supporting services, which underlie the delivery of all the other services but are not directly accessible to people, nutrient cycling and primary production were selected.

8. The selected ecosystem services are however interlinked and cannot therefore be treated in isolation: this might lead to a new form of sectoralization. By dealing with them in bundles of interlinked services and by reversing their decline through improved ecosystem functioning and increased resilience a sustainable contribution can be made to human well-being. For example, by focusing on a restricted set of the key services in a shared watershed, e.g., climate regulation and water regulation through the “reduced emissions from deforestation and degradation” (REDD) approach, additional benefits can be derived from other services such as fresh water (increased dry season flows), fibre, aesthetic values, natural hazard regulation (reduced flood risk), etc. Provided equitable access to these services is guaranteed, these improvements will sustainably contribute to well-being.

9. The conceptual framework that guides the ecosystem management programme allows the identification of five specific entry points for UNEP intervention, aimed at improving the delivery of country or region-specific bundles of the selected key ecosystem services. Each intervention at one of these specific entry points, e.g., capacity-building for improved land management, will require the collaboration of different disciplines and the mobilization or development of specialized expertise coordinated through a single workplan.

10. The current programme document does not identify these specific interventions at the activity level for each of the scales (global, regional, national and local) at which the ecosystem management programme needs to operate for both short-term (through interventions on the direct drivers) and long-term (through interventions on the indirect drivers) gains in ecosystem service delivery for human well-being. The specific interventions will be elaborated through the biennial programme of work and additional planning tools.

I. Introduction

11. One of the six priorities of the UNEP medium-term strategy for 2010–2013 is that “Countries utilize the ecosystem approach to enhance human well-being”. Developed through a UNEP-wide process, with inputs from key partner organizations, the present document proposes an ecosystem management programme that operationalizes the ecosystem approach, with a view to accomplishing the following:

- (a) Countries and regions increasingly integrate an ecosystem management approach into development and planning processes;
- (b) Countries and regions acquire the capacity to use ecosystem management tools; and
- (c) Countries and regions begin to realign their environmental programmes and financing to tackle the degradation of selected priority ecosystem services.

12. This programme document expands on the rationale which underlies a more holistic approach to environmental management capable of sustaining the ecosystem service delivery essential for human well-being. Sectoral and biome-based approaches have largely failed to reverse this trend. The ecosystem approach put forward here is guided by a conceptual framework—largely based on the Millennium Ecosystem Assessment—which acknowledges the interdependency of coupled ecological and social systems and recognizes the multi-dimensional aspects of human well-being. Key attributes of the approach are captured in sections on ecosystem services and human well-being, on ecosystem functioning, biodiversity and ecosystem resilience, on multiple scales and stakeholders, on synergies and trade-offs and on equity and distribution.

13. On the basis of the state of and trends in the world’s ecosystems, the UNEP mandate and its comparative advantage and partners, the ecosystem management programme identifies the strategic priorities centred on 11 ecosystem services in global decline. By centring on these priority services, not as independent products but in bundles with an emphasis on regulating services (e.g., climate, water and natural hazard regulation), a sharper focus is achieved and the impact of UNEP on the ground maximized within budgetary limits. Even in countries where the priority services are not in decline, attending to them as bundles of interdependent services will enhance ecosystem resilience, thus providing safety nets against unexpected events e.g., climate change, invasive species, natural disasters, etc.

14. The ecosystem management programme illustrates entry points for interventions by UNEP, through a few examples attached to the conceptual framework. Links to the expected accomplishments are clarified, while relations with the other key result areas of the medium-term strategy are briefly explored. The specific UNEP interventions at the activity level will be elaborated through the biennial UNEP programme of work and additional planning tools.

II. Programme rationale

15. The fourth report in the UNEP Global Environment Outlook report series – Environment for Development (GEO-4) (2007) – presents an urgent call to action to tackle global environmental challenges. Climate change, land degradation, water shortage and biodiversity loss are among the most persistent and growing problems faced by today’s world, indicating that ecosystem functioning is threatened at a level that increasingly affects human well-being. In comparison to the 1987 baseline (as identified by the Brundtland Commission), progress has been made on some relatively straightforward problems (e.g., ozone depletion and local air pollution), but social demands and practices have resulted in a continuing decline in the world’s natural wealth and its associated delivery of benefits –*ecosystem services* (see the box on p. 3 for working definitions).

16. The Millennium Ecosystem Assessment showed that 15 of the 24 ecosystem services that it assessed were in decline. The assessment demonstrated, more clearly than ever before, the importance of functioning ecosystems for sustaining human well-being and concluded that a continuing decline in ecosystem services could be a barrier to the attainment of the Millennium Development Goals in developing countries and to sustainable development for all countries. The links between environment and human well-being are complex, but many constituents of human well-being (income, food, water, shelter, health, energy, etc.) are dependent on the productivity of ecosystems and on access to ecosystem services. Declines in ecosystem services most strongly affect the well-being of the world’s

socially disadvantaged and vulnerable people. They are therefore particularly susceptible to ecosystem change. At the same time, any decline in ecosystem services undermines human well-being in all countries, developed and developing alike, and in urban and rural areas equally.

17. The traditional sectoral approach to natural system management has largely been ineffective in maintaining ecosystem productivity and biological diversity, in stopping habitat fragmentation and in halting the overall decline in ecosystem services critical for human well-being. Impacts can be felt in agriculture, forestry and fisheries and in lowered ecosystem resilience to natural and human-caused disasters resulting in increased suffering and loss of life.

18. In spite of these overall trends, there are success stories in various settings in which environmental management interventions have enhanced ecosystem processes, improved human well-being and reduced poverty.¹ Many of these successes are related to a shift from the sectoral approach to a more holistic, integrated and systematic way of dealing with issues (e.g., integrated water resources management, land-use management and integrated coastal zone management) and to stronger participation of the full range of stakeholders, including at the grassroots level, in planning and management. The success of these approaches can be traced back to the ecosystem approach underlying these various management strategies, which focuses on functional relationships and processes within and between ecosystems and acknowledges the links with social processes.

Working definitions

*An **ecosystem** is a dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit. Humans are an integral part of ecosystems. Ecosystems vary enormously in size; a temporary pond in a tree hollow and an ocean basin can both be ecosystems.*

*The **ecosystem approach** is a strategy for the integrated management of land, water and living resources that provides sustainable delivery of ecosystem services in an equitable way.*

***Ecosystem services** are the benefits that people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as regulation of floods, drought, land degradation, and disease; supporting services such as soil formation and nutrient cycling; and cultural services such as recreational, spiritual, religious and other non-material benefits.*

***Ecosystem resilience** is the level of disturbance that an ecosystem can undergo without crossing a threshold to a situation with different structure or outputs. Resilience depends on ecological dynamics as well as the organizational and institutional capacity to understand, manage and respond to these dynamics.*

***Human well-being** is the freedom of choice and action to achieve basic material for a good life, health, good social relations and security. Well-being is at the opposite end of a continuum from poverty, a pronounced deprivation in well-being.*

Sources: Convention on Biological Diversity, Millennium Ecosystem Assessment

19. Ecosystem thinking is complex, but the continuing clarification of its terminology, the availability of economic tools for the valuation of ecosystem services and an increasing body of successful case studies (e.g., CBD/SBSTTA 12)² call for a wider application of the ecosystem approach. The major challenge is mainstreaming the ecosystem approach into development planning and policy practices. For example, notwithstanding obvious interlinkages among forest cover, agricultural practices, natural wetlands and freshwater flow regimes, each of these tend to be addressed by separate programmatic approaches, from different institutions and with insufficient integration. As a consequence, both the quantity and the quality of available water are often inadequate for human well-being and ecosystem functioning.

1 Kerr et al., 2002, "Watershed Development Projects in India: an evaluation", International Food Policy Research Institute, Washington; World Resources Institute, 2005, "World Resources 2005", chapter 5, Village by village : recovering Fiji's coastal fisheries.

2 At its twelfth meeting, held in Paris, in July 2007, the Subsidiary Body on Scientific, Technical and Technological Advice of the Convention on Biological Diversity conducted a detailed review of the application of the ecosystem approach. See www.cbd.int/doc/meeting.aspx?mtg=SBSTTA-12. Case studies are available in a source book.

III. UNEP strategic approach to ecosystem management

20. Halting the decline in ecosystem services highlighted by the Millennium Ecosystem Assessment requires a radical shift in thinking about environmental management. The traditional sectoral and biome-based approaches to environmental policy setting and implementation have had limited success for a number of reasons:

- (a) Efforts to halt the decline in ecosystem services were seen primarily as conservation-driven and considered as irrelevant to development thinking;
- (b) The interdependence of ecosystem services and the multidimensionality of human well-being were largely ignored;
- (c) The different temporal and spatial scales at which the drivers of change and the declines in ecosystem services operate were rarely considered;
- (d) The fact that declines in ecosystem services affect different social groups in different ways was not acknowledged; and
- (e) Trade-offs among ecosystem services and the determinants of well-being were not explicitly considered.

21. By taking a more holistic view of the links between ecosystem services and human well-being, the ecosystem management programme proposed in this strategy can help narrow many of the gaps identified above. The programme moves away from sectorally defined units to units defined in ecological terms and analyses the natural, social and economic impacts and stressors on these units. It relies on collaborative decision-making by all relevant stakeholders and users that may, and often do, have different values, conflicting interests and capacities to understand and manage these systems.

22. Central to the proposed ecosystem management programme are the *functioning* and the *resilience* of the ecosystems that provide the services and *equitable access* to the services. Ecosystems can continue to function in less desirable states (i.e., decline in delivery of ecosystem services lowered human well-being). By building ecosystem resilience, however, the chances of this are reduced. Equitable access is a prerequisite as – by and large – an increase in human well-being often obscures decreased well-being in the disadvantaged.

23. The ecosystem management programme is guided by a conceptual framework based on the Millennium Ecosystem Assessment. A brief description of the conceptual framework and its main elements is provided below, followed by a presentation of its key attributes.

A. Conceptual framework of the ecosystem management programme

24. The ecosystem management programme conceptual framework provides a simplified schematic representation of the complex relationships between natural and social systems, seen through the lens of ecosystem services and human well-being. The millennium ecosystem assessment conceptual framework, which has four main elements (constituents and determinants of human well-being; indirect drivers; direct drivers; and ecosystem services) provides a good starting point for the ecosystem management programme (see figure 1). A direct driver (e.g., pollution from the increased

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