



Planning and networking for ecosystem based management of large marine ecosystems



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1. Introduction

Since 1995, the Global Environmental Facility (GEF) has included support for advancing economically developing countries toward ecosystem based management (EBM) of the goods and services of Large Marine Ecosystems (LMEs). The natural and social sciences supporting GEF financed EBM projects include time-series based metrics within the framework of five ecosystem modules: (i) productivity, (ii) fish and fisheries, (iii) pollution and ecosystem health, (iv) socioeconomics and (v) governance. Natural scientists have contributed to the development and application of indicators for the first three modules, whereas social scientists have made significant contributions to the last two listed modules (socioeconomics, governance). Information from all five modules is factored into EBM assessments in support of actions for recovering and sustaining LME goods and services.

The LME modular approach promotes the integration of natural and social sciences to advance application of EBM practice in LMEs. The approach is fully compatible with the bottom-up planning as prescribed by the GEF for projects in support of GEF International Waters focal area requiring Transboundary Diagnostic Analysis (TDAs) and Strategic Action Plans (SAPs). The processes to be carried out in prioritization of transboundary issues to be addressed in TDA formulation and in the subsequent project implementation plan (SAP) are discussed by Alfred Duda in this theme issue under the Governance section.

2. The LME project planning process

The GEF Secretariat, located within the World Bank in Washington DC, is the world's principal source of financial support for developing countries committed to improving the degraded global environmental conditions. Following the United Nations Conferences in Rio on Environment and Development in 1992, the GEF was advanced from a pilot program status to a fully funded global effort to support financing of projects for developing countries in several environmental sectors—forests, deserts, climate change, biodiversity, and international waters. Networking with the GEF is focused within the International Waters focal area for marine projects. The focal area promotes networking among United Nations (UN) agencies and marine institutions to assist developing countries in the planning and implementation of ecosystem based assessment and management projects focused on sustaining coastal ocean goods and services within the spatial domains of LMEs. The GEF provides funding to countries sharing the resources of an LME for supporting a series of transboundary

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working group meetings to complete a Transboundary Diagnostic Analysis of priority issues to be addressed for improving the conditions of the ecosystem and sustaining its goods and services. The priorities of the TDA become the subject of further planning by the participating countries to decide on a Strategic Action Plan. The financial support for reaching the objectives of the SAP is granted to the participating countries following approval by the GEF Council of Advisors. When approved, an Implementing agency and an Executing agency selected from the UN System of agencies and other qualified institutions are designated by the GEF to provide assistance to countries in operationalizing the SAP.

During the TDA and SAP process to ensure that projects are focused on management of LME goods and services from an ecosystem perspective, effort is undertaken to crosswalk the TDA and SAP process with the five modules (Carlisle, 2014). Information on the crosswalking effort is available for the Yellow Sea LME projects carried forward by the Peoples Republic of China and the Republic of Korea (UNDP/GEF, 2007) and the 16 countries participating in the Gulf of Guinea project (Honey and Elvin, 2013). Both projects included support to integrate Marine Protected Areas (MPAs), Integrated Coastal Management (ICM), and Marine Spatial Planning (MSP) practices into the projects.

3. LME global networking

During the period of the first five GEF funding replenishments (1992 to 2013), projects supporting the introduction and implementation of EBM practice were extended to 110 countries within the spatial domain of 22 LMEs and financed with \$3.15 billion in funds catalyzed by the GEF. A listing of projects and funding levels is given in Sherman (2014). In the lead-up to the 6th financial replenishment of the GEF, 2014–2018, the global network of LME project specialists engaged in scientific, technical, policy, and management actions has grown from several hundred in 1995 to several thousand in 2014. The core of the global movement towards sustainable development of LMEs (Sherman et al. 2005) includes the following five UN agencies—UNDP, UNEP, UNIDO, FAO, and IOC-UNESCO—the International Council for the Exploration of the Sea (ICES), three non-governmental institutions—WWF, IUCN, Conservation International—and five national development agencies offering international assistance focused on coastal ocean issues facing developing countries—GIZ of Germany; Norway's NORAD; Sweden's SIDA; Iceland's ICEIDA, and U.S. NOAA. Beginning in 1992 and continuing through 2013, 15 annual sessions were convened of the IOC-UNEP-IUCN-NOAA Consultative meetings on Large Marine Ecosystems (LMEs) at IOC headquarters in Paris. Reports from the first 15 years can be downloaded from www.lme.edc.uri.edu. At the 15th session, 47 LME scientists, project managers, and policy experts representing several thousand LME project practitioners participated from Africa, Asia, Latin America, Europe, North America, the Pacific, and Caribbean.

4. The way forward

For the 6th replenishment (2014–2018), 31 projects relevant to advancing EBM practice in LMEs around the globe are being supported. Among these, 11 are multidisciplinary EBM projects supported by \$1.23 billion in financial assistance from the GEF and other sources for sustaining LME goods and services. The remaining 20 projects are focused on single sector issues from an EBM perspective. Six are addressing fisheries and EBM, seven are in the pollution sector, one each on habitat, MPAs, MSPs, and socioeconomics, while three are focused on governance from an EBM perspective. The 20 single-sector projects are being supported by \$1.63 billion in GEF and other catalytic funding bringing the total amount in support of EBM within the spatial domains of LMEs for 2014–2018 to \$2.86 billion (IW:LEARN, 2015). For the period 1992 to 2018 the total is \$6.01 billion.

It is stated in the GEF 6th replenishment guidance document that “The LME approach represents an opportunity to support coordinated responses towards reducing land-based sources of marine pollution, habitat protection, as well as sustainable fisheries management across all programs” (GEF, 2014). A description is given in IW:LEARN (2015) of the projects constituting the \$2.86 billion for advancing developing countries towards EBM, applying both multidisciplinary and single sector projects by code, title, designation of implementing and executing agencies, GEF focal areas, start date, complete date, GEF grant amount, and total project cost. In addition, a description is given of the type of project in relation to ecosystem based approach or sector-by-sector approach including fisheries, pollution, habitat, coastal zone management, marine spatial planning, socioeconomics and governance that can be integrated into an EBM long-term program for sustainable development of LME goods and services.

The IW-LEARN 2014–2018 replenishment document (IW:LEARN, 2015) is intended for use by the IOC-UNESCO network of LME practitioners, the GEF World Bank, UN, and national partnering agencies, and non-governmental organizations. The projects listed in the document represent a highly significant augmentation to the global movement towards sustainable development of LMEs (Sherman et al., 2005) and towards meeting the UNCED (2012) ocean goal to “protect and restore the health, productivity, and resilience of oceans and marine ecosystems, and to monitor their biodiversity, enabling their conservation and sustainable use for present and future generations... and in doing so, to ...effectively apply an ecosystem approach and precautionary approach to the management in accordance with international law, of activities having an impact on the marine environment...” (UNCED, 2012).

On the way forward to achieving the 2012 UNCED oceans goal it will be necessary to engage a cadre of thousands of LME practitioners in an accredited program of training for professionals engaged in LME projects across the globe. The formulation

of a program syllabus is underway for implementation as a Massive Open Online Course (MOOC) titled, “Large Marine Ecosystem Assessment and Management.” The course will accommodate distance learning for 10,000 professionals and others, with the appropriate prerequisites for admission, to a one-semester graduate level course of instruction in LME productivity, fish and fisheries, pollution and ecosystem health, socioeconomics, and governance. Successful completion of the course will earn the participant a certification as an LME practitioner.

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