

**Inception Workshop and First Project Steering Committee Meeting of the Global
Foundations for Reducing Nutrient Enrichment and Oxygen Depletion from Land-
based Pollution in Support of Global Nutrient Cycle
Manila, Philippines, 27-29 March 2012**

A. Introduction

- i) The Inception Workshop and First Project Steering Committee (PSC) Meeting for the GEF project entitled, Global Foundations for Reducing Nutrient Enrichment and Oxygen Depletion from Land-based Pollution in Support of Global Nutrient Cycle, was co-organized by the United Nations Environment Programme (UNEP) and the PEMSEA Resource Facility (PRF). The Department of Environment and Natural Resources (DENR) of the Philippines hosted the meeting
- ii) The meeting was held at Crowne Plaza Hotel, Manila, Philippines from 27 to 29 March 2012.
- iii) The meeting was attended by 13 international participants representing key international organizations and scientific and research institutions and 29 participants from the Philippines representing various agencies and offices with projects and programs in Manila Bay, including the private sector and the academe. The PRF served as the Secretariat for the meeting.
- iv) The provisional agenda for the meeting is attached as Annex 1. The list of participants is attached as Annex 2.

B. Opening of the Meeting

- v) Atty. Analiza Rebuelta-Teh of DENR welcomed the participants and expressed appreciation to the project's partners for taking concrete steps to initiate the project after its launching during the recently concluded GPA/Inter-governmental Review Meeting, which was held in January 2012 in Manila. Usec. Teh proposed key items for discussion in support of the implementation of the Manila Declaration, as adopted in the GPA/IGR-3 meeting by the governments and where the country partners agreed to support the development of the Global Partnership on Nutrient Management (GPNM). Usec. Teh highlighted that the Philippines, through the implementation of the Sustainable Development Strategy for the Seas of East Asia (SDS-SEA), is supporting the Manila Declaration, noting that the SDS-SEA and the Manila Declaration both adopt an integrated management framework. Finally, Usec Teh articulated DENR's support to the project through provision of counterpart support.
- vi) Mr. Kaj Sanders of MIE emphasized that the project provides opportunity to raise awareness on nutrient management. Mr. Sanders underscored, in particular, the importance of on-the-ground experiences in nutrient management in Manila Bay to the GPNM. He expressed optimism that the workshop will achieve its objectives with the involvement of the various partners and stakeholders present

- who will collectively search for solutions to help address the problem of nutrient enrichment and oxygen depletion in Manila Bay.
- vii) Dr. Anjan Datta, Programme Officer of UNEP recalled that the governments took critical decision on nutrient management during the GPA/IGR-3 meeting through the adoption of the Manila Declaration. Building on the political commitment generated from the IGR, Dr. Datta expressed optimism that the project will gain support from the various stakeholders. He urged the participants to deliberate on the project and move as a unified body in identifying clear actions on how the project will proceed in the most efficient manner.
- viii) Prof. Raphael P.M. Lotilla, Executive Director PRF, affirmed the significance of the meeting in advancing the work that has been initiated particularly in Manila Bay. Prof. Lotilla welcomed the opportunity for building partnerships not only at the local level but also at the global level, taking note of the presence of international experts in providing their perspective in managing Manila Bay and in partnering with the local experts from the Philippines. Prof. Lotilla assured the meeting that the PRF fully supports the endeavor.

C. Inception Workshop

1. The Inception Workshop was co-chaired by Atty. Analiza Rebuelta-Teh, Undersecretary and Chief of Staff of DENR and Mr. Kaj Sanders, Senior Policy Advisor of the Ministry of Infrastructure and the Environment (MIE), Netherlands.
2. Usec. Teh of DENR presented the objectives of the meeting. She advised that the meeting was divided into two parts, the inception workshop and the PSC meeting:
 - a) The inception workshop will focus on the project objectives, strategy and outputs and provide major stakeholders in the management and rehabilitation of Manila Bay the opportunity to provide inputs in the execution of the project.
 - b) The PSC meeting aims to provide the different project component implementers an opportunity to discuss the different components of the Global Foundations project, the interlinkages, and work schedules, as well as finalize the project work plan and budget.

Introduction of the Global Foundations Project

3. In his introduction of the project, Dr. Datta established the rationale for the project by providing key facts and figures on the extent of hypoxic/eutrophic conditions in coastal areas at the global scale and the implications with regard to loss of ecosystem services. It was estimated that the loss of ecosystem services is valued at USD 200 billion/year. Dr. Datta emphasized that the partnership project aims to contribute in achieving a “blue ocean” and “green field”.
4. Dr. Datta provided details on the project outcomes and outputs for each of the 4 components, their linkages, the project budget, the sources of co-financing, the various partners involved and the governance structure.

5. The 4 components of the project were identified as:
 - a) a strong and vibrant global partnership in nutrient management;
 - b) development and application of quantitative modeling approaches for nutrient loadings and their impacts in coastal waters at the global, regional and local scales;
 - c) development of a policy toolbox; and
 - d) execution of a nutrient reduction pilot project in the Manila Bay watershed.
6. The project will benefit from the collective effort of various partners particularly from the concerned government agencies and scientific institutions in the Philippines, India, USA and the Netherlands, the scientific community, the industry, the NGOs and CSOs, from regional projects and UN agencies.
7. Dr. Datta reinforced Usec. Teh's statement concerning the government's commitment to support the Global Nutrient Cycle Project through the implementation of the Manila Declaration. Dr. Datta further stressed that the selection of Manila Bay as the pilot site is significant because the declaration was signed in Manila during which the Government of the Philippines, represented by DENR, served as host of the GPA/IGR-3.

Overview of Manila Bay

Preliminary assessment of hypoxia in Manila Bay

8. Dr. Gil Jacinto of the UP-Marine Science Institute presented the results of a preliminary assessment of hypoxia and eutrophication in Manila Bay. Dr. Jacinto explained that hypoxia is the condition of very low levels of dissolved oxygen (<2.8mg/L) in the water column while eutrophication is the enrichment of nutrients in water bodies.
9. Manila Bay, identified as one of the pollution hotspots in the East Asian Seas region, is home to about 26 million people and receives about 250,000 t of BOD/year. Manila Bay has a catchment area of 17,000 km², an average depth of 17 m and influenced largely by two major river systems, i.e., Pasig and Pampanga Rivers. The results presented covered dissolved oxygen (DO) and nutrients (NH₃, NO₃, PO₄ and SiO₄) concentrations measured in 31 stations in the bay during the northeast (cool, dry season) and southwest (rainy) monsoons of 2010 (February and July) and 2011 (February and August). Although the conditions vary seasonally, the preliminary results showed a seemingly worsening hypoxic condition of the bay, with the hypoxic layer increasing from approximately 9m in July 2010 to about 19 m in August 2011. Coinciding with the low levels of DO, elevated concentrations of nutrients (i.e., NO₃, PO₄ and SiO₂) were also observed in the midsection of the bay. It was highlighted however that such initial results need to be further validated by a more frequent sampling strategy, and results of modeling and pollution tracing studies. Nonetheless, the assessment provides a benchmark against which impacts of management interventions (e.g., MBEMP, Manila Bay Coastal Strategy, Manila Third Sewerage Project, Supreme Court continuing mandamus, etc.) can be evaluated.

Stakeholder's remarks

10. The following stakeholders provided views on the proposed project objectives and expectations in the context of Manila Bay rehabilitation:
 - 10.1 Ms. Risa Halagueña, representative of the Supreme Court of the Philippines informed the meeting that the role of the Supreme Court, through the Manila Bay Advisory Committee (MBAC), is to oversee the implementation of the Supreme Court's Decision, which was passed in 2008, requiring 13 government agencies to implement the Operational Plan for the Manila Bay Coastal Strategy (OPMBCS). Under the *writ of continuing mandamus*, the government agencies are required to submit quarterly progress reports to the Supreme Court indicating the progress made in rehabilitating Manila Bay.
 - 10.2 Ms. Halaguena elaborated on the main causes of degradation of Manila Bay, which include the presence of informal settlers that directly discharge their wastes into the waterways and solid and liquid wastes generated from land- and sea-based activities. For solid waste management, 9 out of the 17 local government units (LGUs) in Metro Manila have solid waste management plans (SWMP) in place. However, only 1 LGU has a SWMP that has been approved by the National Solid Waste Commission. Ms. Halaguena cited a number of constraints and challenges in the implementation of the Supreme Court decision. These include mechanisms for institutional collaboration and coordination, raising awareness on the costs of environmental problems to facilitate engagement of the public in the rehabilitation of the Bay and limited capacity on the part of the mandamus agencies. Ms. Halaguena reiterated that the Supreme Court is positive that the nutrient reduction project would facilitate cooperative efforts in the rehabilitation of Manila Bay, particularly in generating best practices that the LGUs can emulate.
 - 10.3 Dr. Elisea Gozun, Presidential Advisor for Climate Change and member of MBAC of the Supreme Court cited that, in view of limited funding and technical capacity of the mandamus agencies and LGUs involved in the rehabilitation of Manila Bay, prioritization of issues and problems and identifying achievable targets should be undertaken. According to Dr. Gozun, solid waste management is the focus of current efforts since it is visible. There appears to be limited understanding on the contribution and impact of sewage and agricultural sources to the pollution problem in the bay.
 - 10.4 Dr. Gozun pointed out that Manila Water and Maynilad, the two water concessionaries responsible in providing safe water and sanitation services, only cover a significant portion of Metro Manila and the provinces of Rizal and Cavite. Beyond these areas, the water districts of the respective LGUs should be brought into the picture. Furthermore, in view of the 3-year terms of office of local chief executives, a mechanism must be put in place to allow for long-term planning. Pressure groups are useful to ensure that the political leaders act.
 - 10.5 Ms. Adelina Santos-Borja of the Laguna Lake Development Authority (LLDA) examined the dynamics of Laguna Lake relative to its connection with Pasig River and Manila Bay, hence establishing the basis for LLDA's involvement in

the project. Ms. Borja opined that the interconnection of the 3 water bodies warrants the integration and coordination among the various projects and programs. She also sees the project as an opportunity to establish and strengthen partnerships, for instance with Chilika Lake Development Authority to facilitate knowledge sharing in addition to capacity development of LLDA.

- 10.6 Mr. Ramon Alikpala of the Metropolitan Waterworks and Sewerage System (MWSS) reaffirmed MWSS' commitment to reach its 100% sewerage coverage for areas covered by the two water concessionaires by 2037, as indicated in the MWSS Master Plan. Mr. Alikpala indicated that the achievement of the said target, however, will rely on a number of factors such as the availability of land where the wastewater facilities can be built. Mr. Alikpala called for stronger support from the LGUs by helping identify areas within their jurisdictions where the wastewater facilities can be situated. As an alternative, MWSS is also looking at different technology options to address the land constraints. Mr. Alikpala also informed the meeting that aside from ensuring water quality, MWSS is also facing the challenge of ensuring water quantity to satisfy the increasing demand for water usage by various sectors. He cited that there is an increasing interest among commercial and industrial establishments to tap Manila Bay as a potential water source. Apparently, desalination is cheaper than connecting to either of the two water concessionaires' water supply lines. He suggested that aside from sewerage problem, this matter should also be looked into.
- 10.7 Mr. Nilo Tamoria, Regional Executive Director, DENR National Capital Region cited that over 80 percent of nutrients being discharged into Manila Bay are coming from domestic sources, particularly from Metro Manila. He likewise raised concern that the contribution from the agriculture sector in the nutrient loading of the bay is not well accounted for. Interventions can be effective as long as their implementation is done in a coordinated manner.
11. Following the presentations by the major stakeholders in Manila Bay area, a general discussion ensued. The following information was shared during the discussion:
 - a) PEMSEA, in coordination with LLDA and PRRC, has undertaken a study to quantify nutrient loadings from domestic, agriculture, forestry and industrial sources covering the Laguna de Bay-Pasig River-Manila Bay watershed.
 - b) An assessment of nutrient loading from croplands has been completed by the Bureau of Soils and Water Management (BSWM) of the Department of Agriculture. Assessment of nutrient loading from livestock and poultry and aquaculture activities is ongoing.
 - c) There is a need to integrate health and sanitation concerns into the management of Manila Bay.
 - d) The management of Manila Bay should be viewed from a wider perspective of sustainable development, and not solely on the basis of individual programs and projects. In this way, proposed and future activities can be designed to better contribute to improving social, economic and environmental conditions in the Bay area.

- e) Research activities should include economic valuation, ecosystem modeling and monitoring, and ensure that the results generated are useful to policy- and decision-makers.
- f) The participation of local communities and stakeholder groups (i.e., farmers, fishers, traders, industries, etc.) should be encouraged.
- g) Communication must be promoted at all levels, including down to the grassroots level.
- h) Building partnerships is a key to fulfilling the objectives of the project, taking into consideration the varying perspectives of the various partners and stakeholders groups.

Overview of ongoing programs and projects

Sewerage and sanitation master plan in Metro Manila

12. Ms. Leonor Cleofas of MWSS presented the Sewerage and Sanitation Master Plan for Metro Manila. Ms. Cleofas highlighted that, as part of the commitment and compliance to the Supreme Court continuing mandamus, MWSS has extended the contracts of the two concessionaires from 2015 to 2037 with the condition to accelerate and double the investments for sewerage and sanitation and to support the development of new water sources. By 2037, both concessionaires should have 100% percent sewerage coverage for the Metro Manila area, as well as the provinces of Rizal and Cavite.
13. Ms. Cleofas informed the meeting that the two water concessionaires are investing over 3 billion USD. The challenges cited include tariff implications due to the huge investments, willingness and capacity to pay, land constraints for the wastewater facilities and policy gaps on water pollution, particularly in reference to pre-treatment standards and revised effluent standards for nutrients.

Operational plan for the Manila Bay Coastal Strategy

14. Mr. Noel Gaerlan of the Manila Bay Coordinating Office (MBCO) provided an overview of the programs, projects and activities that the MBCO is coordinating in relation to the implementation of OPMBCS, particularly in compliance to the Supreme Court continuing mandamus. The initiative and accomplishments in the following clusters: a) Liquid Waste, b) Solid Waste, c) Informal Settlers and d) Habitat and Ecosystem were highlighted.

Assessment of nonpoint source pollution from croplands of Manila Bay system

15. Dr. Edna Samar from the Bureau of Soils and Water Management (BSWM) of the Department of Agriculture presented the results of the assessment which aimed at gathering baseline data for the estimation of the pollution loading for croplands into the Manila Bay system. Eighteen (18) water and twenty five (25) soil sampling sites were established at four (4) sub-watersheds (i.e., Pampanga River Basin, Pasig River Basin, Bataan watershed and Cavite watershed) that span the Manila Bay system. The parameters measured to estimate loading included nutrients (nitrate and phosphate), heavy metals (lead, chromium, nickel, copper and zinc), pesticides residues (organochlorine, pyrethroid, organophosphates) and coliform (total and fecal coliform). Of the estimated total

- agricultural areas of 817,750 ha in Manila Bay, 813,943 ha are classified as croplands.
16. Results of the assessment indicated that the concentrations of NO₃, NH₄-N and TP and heavy metals in soil and water samples are within limits/criteria while pesticide residues are below the lower limit of quantification. Total and fecal coliform in water in some sites exceeded allowable levels for Class SB water classification. For the anthropogenic sources, nutrient loading from croplands included commercial fertilizers and pesticides (insecticide, herbicide, fungicide, molluscicide, and nematocide). The average use of N & P was found to be below the recommended rates. Of the estimated nutrient use of 52,102 MT, it was estimated that 29,491 MT or 51% represent loading into the environment.
 17. Although the level of current fertilizer application in the Manila Bay watershed is considered to be below the recommended rate, it was suggested that the project needs to include the key stakeholders, (i.e., farmers and farmer groups, etc.) in order to raise awareness and understanding on efficient use of fertilizers and increased food production. Dr. Samar indicated that a considerable number of farmers welcome new technologies to increase productivity and improve efficiency. Furthermore, their involvement would allow the project team to understand better their perspective and attitudes and the way the farmer groups are organized.
 18. In the context of the project and the estimation of the total pollutant loading in the Laguna Lake-Pasig River and Manila Bay watershed, the results of the BSWM assessment would be very useful for the refinement of the outputs generated from the total pollutant loading (TPL) initiative being undertaken by LLDA, PRRC and PEMSEA.

Pasig River Rehabilitation Program

19. In his presentation, Engr. Richard Penaflo of the Pasig River Rehabilitation Commission (PRRC) highlighted the multistakeholder approach and community participation in the rehabilitation of the river, particularly along key “esteros” or tributaries that are draining into the Pasig River. The presentation initially showed the sad state of the tributaries and the sequential efforts of various players in rehabilitating selected “esteros”, which are intended to serve as pilot sites for other areas of the river.
20. Massive public awareness campaigns and community participation were conducted in coordination with the media. In addition, the establishment of the River Warriors, consisting of volunteer groups to sustain the rehabilitation and conservation efforts through the conduct of continuous awareness campaign and monitoring of the community activities, has been considered an innovative way of involving various sector groups in the process.
21. In addition to the national agencies, PRRC was able to engage the private sector group through their CSR programs, to develop clean-up activities along the esteros.

22. The Pasig River Master Plan covering the period 2012-2016 was presented showing the spatial and temporal coverage of the rehabilitation efforts along the 27-km stretch of the Pasig River System, including Manila Bay, until 2016.

Laguna Lake Environmental Management Program

23. The presentation from Ms. Adelina Borja indicated that LLDA's environmental programs take into consideration the inter-linkages of the 3 bodies of water, Laguna Lake, Pasig River and Manila Bay.
24. Within the Laguna Lake, the two major environmental problems identified included siltation and pollution. Environmental programs that are being implemented to address these concerns included:
 - a) Regulation of effluent discharge through the environmental user fee system involving issuance of permits and clearances, surveillance and monitoring of business establishments and enforcement of applicable regulatory measures;
 - b) Regulation of aquaculture activities;
 - c) Solid waste management in collaboration with the local government units within the lake's watershed;
 - d) Implementation of river rehabilitation program with the involvement of the River Councils in 24 sub-watersheds in the lake and complementing the efforts of the Pasig River Rehabilitation Commission relative to Pasig River;
 - e) Reforestation and afforestation activities; and
 - f) Water quality monitoring.
25. An innovative way of communicating the results of the water quality monitoring in a non-technical manner was developed for the benefit of the various stakeholders of the bay. Such mechanism is called the Water Mondriaan, which uses the primary colors to represent the different water quality parameters being measured under the water quality program.
26. Under the Global Foundations Project, LLDA sees the opportunity for enhancing capacity and possible collaboration with Chilika Development Authority, particularly in the development of the ecosystem report card.

Total pollutant loading (TPL) in Laguna Lake-Pasig River-Manila Bay watershed

27. Mr. Emitterio Hernandez of LLDA presented the initial results of the application of a waste load model in the Laguna Lake-Pasig River-Manila Bay watershed. The waste load is estimated based on the emission factor and emission variable principle for each of the relevant pollutant sources. The model calculated the total BOD, total N and total P loadings for the 58 sub-basins in the watershed for the years 2008 and 2010, and projected loadings for 2015 and 2020. Results showed that domestic sources account for about 80-90 percent of total BOD, N and P loadings in the watershed areas. The industrial and commercial sector were shown as the second major pollutant source (>10 to about 20 percent) while the agriculture and forestry sectors account for less than 10% of the total pollutant loadings.

28. Initial results of pollutant load calculations for the Marilao-Meycauayan-Obando river basin were also presented. High BOD, N and P loading were observed in the Valenzuela, Meycauayan North and Caloocan sub-basins.
29. The waste load estimations will be further refined to consider the impact of management interventions (e.g., existing and planned sewage treatment plants). Water quality model for the Manila Bay and Pasig River and waste load models for the other major river systems in the bay will also be developed.
30. The emission factors used in the development of the model were based on per capita loading as cited in literature. The waste load production per capita or population equivalent is subdivided into grey water discharge (domestic wastewater from washing and bathing) and black water or waste loads from toilets. In particular, 10g BOD/capita/day from grey water generation and 20 g BOD/capita/day from black water was used
31. The modeling results for Laguna Lake have been validated with water quality monitoring data. However, this is yet to be undertaken for the expanded Laguna Lake-Pasig River-Manila Bay watershed model. The need for monitoring data that will validate and provide a feedback mechanism for the refinement of models was stressed.
32. It was further emphasized that the development of modeling scenarios need to take into account the required capital investments, operating costs and the cost-benefit with respect to the overall target of rehabilitation of water quality in Manila Bay and its watershed areas.

Nutrient management in India

33. Dr. N. Raghuram, co-founder of the Indian Nitrogen Group (ING), provided a brief background on the efforts of ING in the nutrient assessment and management in India. Established in 2006, the ING consists of about 200 members from partner government agencies, academe, research institutions, industries and other stakeholders. The ING conducts policy and scientific researches, as well as advocacy on nutrient management through publications and conferences. ING presented estimates of N and P fluxes in major river systems in the east coast of India, totaling to about 61,272 million g/yr of N and 51,719 million g/yr of P. The presentation also covered results of the algae research in the Indian coast, assessments of the Odisha coast, Mahanadi and Chilika Lake, and the nitrogen pollution assessments of groundwater and river systems in India. Other activities identified included: the standardization of methodologies on nutrient assessment, mapping of the nutrient (N and P) flows, including sources and sinks in India and the development of a framework for the national assessment of nutrient cycles.

Open Discussion

34. Based on the presentations, the meeting participants provided the following insights and comments:
 - a) Utilize available platforms such as the LLDA Decision Support System and build on what has been established.

- b) Existing donor-based projects of the government should be taken into consideration in terms of determining where the project's limited resources should be channeled and where it can make a difference.
- c) Establish partnerships to promote sharing of data and information, expertise and resources.
- d) Identify appropriate mechanisms for maintaining and sustaining the partnership.
- e) Link targets with required actions and management interventions to achieve the targets.
- f) The project should be viewed in the context of sustainable development, where sewerage and sanitation is one of the issues to be addressed along with other concerns (e.g., food security; poverty reduction; climate change impacts; etc.).
- g) In order to get the attention of policy makers and politicians, the social, economic and environmental benefits of the project should be clearly communicated.
- h) Develop messages that elicit response calls for targeted communication. Utilize the social media to reach out to a wider audience.
- i) Manila Bay was recognized as a multi-sector and multi-use resource thus warranting a different management approach.

D. Project Steering Committee Meeting

35. Mr. Kaj Sanders of MIE, the Netherlands, chaired the PSC meeting. For the presentation of the 4 project components, Mr. Sanders requested the component leaders to address 3 key aspects, i.e., doability in terms of prioritization and timing, relevance of outputs and linkages with other components and adequacy of budget.

Project Component B

36. Dr. Henrik Enevoldsen of IOC UNESCO presented Component B, which focuses on developing and applying quantitative modeling approaches to estimate and map sources and contributions of different nutrient sources to coastal nutrient loading and their effects; indicating when nutrient over-enrichment problem areas are likely to occur; and estimating the magnitude of expected effects of further nutrient loading on coastal systems under a range of scenarios.

37. The component consists of 7 sub-projects and the expected outputs are as follows.

- a) overview of existing tools for source-impact analysis;
- b) global data bases on nutrient loading, occurrence of harmful algal blooms and hypoxic areas, and on coastal conditions, nutrient sources and effects;
- c) nutrient impact modelling to provide source-impact analysis at global/regional scales and in relation to Manila Bay watershed, enabling predictive capability/assessment of effects/and development of regional models and maps;
- d) summary models and analysis tailored to assist policy making;
- e) training of regional and national scientists/policy experts in source impact modelling, and

- f) source impact guidelines/user manuals for integrated assessment and nutrient criteria to assist policy makers.
38. The meeting noted the following during discussion:
- a) The time required to complete the modeling should be clarified since it has implications on the outputs of the other components of the project.
 - b) Since the end users of the project are the policy and decision makers, there should be an effort to fast track the completion of outputs to enable the evaluation of impacts of the recommended interventions in the 3rd year.
 - c) A medium-term scenario can be considered where the modeling may still proceed using available data. The first order output can be a “guesstimate”. Higher resolution estimates can be generated later depending on how much data will be gathered to run the model to their full potential.
 - d) It was established that about 70 percent of the pollutants entering Manila Bay originate from two major sources, i.e., Pasig River and Pampanga River. It was suggested that the modeling focus on these two river systems as well as Manila Bay as priority. First order estimates could be utilized in the other river systems in the Bay area, where data may be lacking, given the limited time and budget for the project. Over the longer term (i.e., beyond the 3-year life of the project) higher resolution estimates can be generated as more data become available.. A scoping exercise to select priority areas can be considered.
 - e) The project should be open to new ideas including possible adjustment in the design and sequencing of activities to fit the local context and for consideration in future investments.

Project Component C

39. Mr. Chuck Chaitovitz of GETF presented Component C, which focuses on the development of a “policy toolbox”, through which the decision-makers will have informed and interactive access, to cost effective, replicable tools and approaches to develop and implement nutrient reduction strategies.
40. The 7 sub-projects under this component are expected to deliver the following outputs:
- a) global overview and inventory of technological/policy options to reduce nutrient over-enrichment;
 - b) in depth case studies of technology/policy options, including analysis of cost effectiveness and success;
 - c) synthesis report providing review of regulations, measures, etc. to reduce nutrients;
 - d) replication and up-scaling strategies;
 - e) consolidated policy toolbox (bringing together above outputs) containing detailed summaries of policy options, technology measures and their achievements, costs, socio-economic impacts, infrastructure required;
 - f) application of source-impact analysis from Component B to the Policy Toolbox to illustrate and communicate method for integrated approach to investments and decision making on nutrient reduction, and

- g) regional and national scientists and policy experts, particularly from developing countries, trained in using the above outputs in order to develop nutrient reduction strategies.

41. The meeting noted the following during discussion:

- a) The policy toolkit is useful for technical people but it should leverage the kind of reaction that the project is intending to elicit from policy makers.
- b) Agents of change at the local level must be considered (e.g., political terms of local chief executives, etc.) in determining the optimal design of the project to ensure that the project outputs would benefit its intended end users.
- c) The project should take advantage of the political momentum created in the recently concluded IGR meeting and the subsequent adoption of the Manila Declaration in pushing the project forward. The selection of Manila Bay as a demonstration site is therefore timely.
- d) The difference between policy and practice was highlighted requiring the meeting to make a decision on the focus of the policy toolkit.

Project Component D

42. Mr. Robert Jara of PEMSEA presented Component D, which focuses on pilot projects in the Manila Bay watershed, Philippines and the Chilika Lake, India on the development and implementation of stakeholder owned, cost-effective and policy relevant nutrient reduction strategies, which can be subsequently mainstreamed into broader planning.

43. The expected outputs from the 4 sub-projects under this component are as follows:

- a) development and integration of indicators, information and reporting on nutrient issues and indicators in Manila Bay watershed into a Manila Bay State of Coast's reporting system;
- b) compilation and analysis of best nutrient reduction practices for Manila Bay area engagement with key sectors (in collaboration with Component C);
- c) application of source-impact modelling and best practices to produce draft nutrient reduction strategies for Manila Bay watershed (in collaboration with Component B);
- d) adoption of nutrient reduction strategies as part of overall approach to water quality improvements in Manila Bay watershed (in collaboration with Components B and C);
- e) application of ecosystem health card for nutrient over-enrichment and impacts for estuarine and delta areas (developed in Lake Chilika, India, as well as Manila Bay watershed), and
- f) evaluation of lessons learned during the development of nutrient reduction strategies, including work on ecosystem nutrient health card in Lake Chilika/Laguna Lake.

44. Ms. Bresilda Gervacio of PEMSEA introduced the Integrated Information Management System (IIMS) and provided details on each of the data categories stored in the system including its features. Ms. Gervacio discussed the status of the Manila Bay IIMS and the actions that are being undertaken in support of the

- project's data requirements, particularly for the modeling component. The presentation also highlighted the linkage of the IIMS with the State of the Coasts reporting system, which is also one of the deliverables of Component D.
45. Ms. Jocelyn Sta. Ana of LLDA presented the water quality program of LLDA. Details of the physico-chemical and microbiological and biological parameters being measured in the sampling stations within the Laguna Lake including key tributaries were presented. It was highlighted that BOD, DO, nitrate and phosphate levels in the west bay of the lake, which is close to urban centers, is greater if compared to the east bay. Ms. Sta. Ana also presented the Pasig River Unified Monitoring Stations in which LLDA and PRRC are jointly collaborating. The Water Mondriann, which is a schematic map of the bay's water system showing the monitoring results in the lake and its tributaries using the primary colors, was also discussed.
 46. Dr. N. Raghuram presented on behalf of the Chilika Lake Development Authority the nutrient management efforts in the lake. Chilika, a Ramsar site in India, is a very shallow lake (avg. depth of 1m) with catchment basin of 4,406 km², and confronted with multiple environmental issues, such as siltation, due to land use changes, decrease in salinity gradient, decline in fish yield and diversity, among others. A new lake mouth was opened as one of the management interventions in the lake. The new opening resulted in improved hydrological exchanges between the lake and adjacent water body. Such improvement also resulted in increased fish and prawn catches and decreased in the infestation of invasive species. The N and P values measured after the opening of new lake mouth (2001-2010) were also observed to be lower when compared with values measured prior to the intervention (1999-2000).
 47. The experiences in Chilika Lake were considered very useful for other areas to learn from.
 48. The meeting noted the following during discussion:
 - a) The data gathering and SOC reporting are within the activities of the Component D. However, the development of the nutrient management strategies, however, needs inputs from the Component B (modeling) and Component C (policy toolbox).
 - b) The IIMS was developed as a tool to help address the local government's needs for data and information to support decision making. It has been applied in the various ICM sites of PEMSEA. IIMS is therefore local government-owned.
 - c) The data needed on river systems (e.g., flow, etc.) may not be readily available. These are critical inputs to modeling and early efforts are needed to identify availability and accessibility of such data.

Project Component A

49. Dr. Anjan Datta of UNEP presented Component A, which focuses on building a global partnership in addressing the causes and impacts of coastal nutrient over-enrichment and hypoxia.

50. The component consists of 3 sub-projects and the expected outputs are as follows.

- a) partnership establishment and stakeholder involvement ;
- b) partnership and project communication strategy, including web platform;
- c) global overview of nutrient over-enrichment and oxygen depletion;
- d) synthesis report identifying emerging issues and knowledge gaps;
- e) establishment of Community of Practice, including web-based platform targeting GEF related projects as part of IW Learn, as well as extension agricultural services;
- f) participation at and input to GPA review and GEF IW conferences, and
- g) replication and up-scaling of good practices and lessons learned.

Agreement of final component project work plans and budgets

51. Refinement of the work plans and budgets was undertaken by the component leaders taking into consideration the results of the PSC discussions.

52. Upon review of the proposed refinements, the PSC Meeting agreed on the following:

52.1 Component B:

- a) The delivery dates for the component outputs will be adjusted in consideration of the requirements of the other components.
- b) Pilot versions of the models (i.e., global and local scales models) will be made available for the mid-term review. The models will be further refined based on the outputs of the mid-term review.
- c) The Manila Bay model will focus on Laguna-Lake, Manila Bay and the two major river systems that have significant influence on the bay (i.e., Pampanga and Pasig Rivers). The development of the model, which will try to integrate the existing modeling systems, and data gathering will be simultaneously conducted and will commence immediately.
- d) Components B and D will maintain close interactions in order to take note of the data requirements for the development of the model. The pilot version will be ready by Year 2 and will be made available to the stakeholders for review.

52.2 Component C:

- a) The initial work plan had no qualification on the extent of the global overview on nutrient over-enrichment. A clear cut definition on the kind of toolbox to be developed is needed. In consideration of the discussions and comments raised, the Component leader will make use of available information and maps on nutrient over-enrichment for selection and evaluation of selected case studies that will be included in the policy tool box.
- b) A concept note on the tool box will be prepared by the Component Leader for review by other partners and stakeholders, and submitted to the PSC for approval.

- c) The training, which will make use of the outputs of Component B, will be conducted in demonstration sites (i.e., Manila Bay, Laguna Lake, Chilika Lake and other parallel sites that will be identified) during the 1st or 2nd quarters of Year 3. Components B and C can closely collaborate in the selection of participants; particularly in bringing in other partners and sites with a view to scaling up nutrient reduction programs.

52.3 Component D:

- a) Year 1 will focus on gathering of the data requirements for the model to be developed under Component B. The data gathering will focus on Laguna Lake, Manila Bay and the two major river systems (i.e., Pasig River and Pampanga River), and will be conducted in collaboration with partners and other stakeholders (e.g., LLDA, DENR, DA, PRRC, etc). Data and information will be made available by the 4th quarter of Year 1.
- b) Apart from the requirements of the modelers, this component will also endeavor to gather a broader set of data/information that can be used in the development of the draft State of the Coasts (SOC) report for Manila Bay. The SOC report for Manila Bay will provide policymakers and other stakeholders an overview of the situation of the bay. The draft SOC report for Manila Bay is targeted to be available by the end of Year 1.
- c) Year 2 will focus on strategy development, which aims to engage expertise (e.g., ETH Zurich) in putting together strategies not only on pollution reduction but also on the socioeconomic implications of the project.
- d) For the implementation of the Chilika Lake project under this component, a separate agreement between UNEP and Chilika Lake will be developed instead of coursing it through PEMSEA.

52.4 Component A:

- a) The nine activities in the component will be implemented as presented in the Project Document.
- b) The global partnership, which was launched prior to the start of the project, brings in the required expertise and all partners will be acknowledged in their contribution to the project.
- c) For the development of the guidance document under Activity 3, the foundation document, which was released in 2010, will be refined based on the outputs of the other components.

53. The PSC Meeting requested all Component Leaders to submit their revised work plans and budgets for the project, and detailed work plans and budgets for Year 1 of the project, as soon as possible.

Communication and outreach strategy

Communication plan and strategy

54. The PSC Meeting noted that the communication plan will be developed in collaboration with the different partners taking into consideration the following aspects:
- a) An audience-targeted communication of outcomes and recommendations of the project (e.g., for policy makers, bureaucrats, the scientific community and the general public);
 - b) Multiple layers of communications, i.e., at the local, national, regional, and global levels, as well as between and among the project partners. It should also take into consideration the local knowledge and area-specific situations;
 - c) Invite communication experts to provide recommendations on the development of a communication strategy. The GPNM may have the expertise in developing communication strategies. It was recommended that the GPNM will develop a proposal and provide to the PSC for feedback.
 - d) The communication strategy should be able to market the partnership for funding opportunities. It was recommended that a communicator group from each of the partners should be established. The possibility of hiring a firm to undertake the task and do it at various levels will be looked into.

Website development

55. The Meeting noted that budget has been allocated for the development of website for the project. The website will share information about the project, including progress and financial reports to all players and partners. The PEMSEA website was recognized as a good example of a project website.
56. The Meeting discussed whether there is a need to develop a separate project website or if it can be embedded within the UNEP-GPA website. No decision was made on this issue.

Project information materials

57. The PSC Meeting noted that a technical paper on the global overview of nutrient over-enrichment will be developed and published under the Communications component of the project. The compilation of information and the drafting of the report have already started and should be ready by May for review and comments. A 2-4 pages synthesis of the technical report will also be developed for policymakers. In addition:
- a) Policy briefs, which communicate scientific data to policymakers, will be developed.
 - b) Fact sheets and ecosystem health report cards will be developed with the intention of attracting the attention of policymakers.
 - c) The project can also consider reaching out to media (e.g., press briefings, etc.).
 - d) Newsletters to share case studies (e.g., case studies in Delhi, organic biosolids of Maynilad, etc) will be developed. The development of the first

newsletter will consider initially a 6-month timeframe but subsequent newsletters will be released on a quarterly basis. The INI will take the lead in developing the first newsletter for the project. A preliminary information bulletin on the outcomes of the inception workshop and the PSC meeting will be developed. This is targeted to be released in a month's time. GETF offered its assistance, as necessary. It was confirmed that GPNM and the project will have two separate newsletters.

Forum and other events

58. The PSC meeting noted that various global, regional and national events will be organized to share information about the project. It was suggested that a common presentation on the project and the GPNM be developed and can be made available to the members for sharing in different venues. Several forthcoming events and forums that the project can possibly participate were identified, including:

- a) Conference on wastewater treatment organized by IWA to be held in India on November 2012;
- b) Annual National Water Quality Meeting organized by the Land Grant University in Oregon in USA;
- c) Pasig River Forum to be held on April 24, 2012 at the ADB Headquarters, Philippines;
- d) East Asian Seas Congress 2012 with the theme, "Building a Blue Economy: Strategy, Opportunities and Partnerships in the Seas of East Asia, to be held on July 9-13, 2012 in Changwon, RO Korea, and
- e) Global traps and GPNM meeting in China in June or July 2013.

59. The PSC meeting noted the significance of the EAS Congress 2012 as a regional forum for partnership development and awareness building under the GPNM and the project. The Meeting encouraged UNEP to make arrangements for GPNM participation in the event.

Other communication strategies

60. The PSC Meeting agreed to the following:

- a) Creation of an e-group for Manila Bay stakeholders, where stakeholders and project and partners can maintain contact (PEMSEA).
- b) Utilization of social media networks to maintain communication among partners (UNEP)
- c) Development of a project logo (UNEP); and
- d) Development of a proposal for the communication plan and outreach strategy of the project and will submit to the PSC for consideration and feedback (UNEP).

Partnership opportunities and support

61. The Meeting recognized a number of opportunities for partnerships, including partners' support to the project:

- a) The E-extension of USDA and IWLearn of GEF serve as platforms for information sharing, feedback mechanism and guidance. USDA offered to provided E-extension software and network for application in the Manila Bay area.
- b) A tripartite MOU among IAEA, IOC-UNESCO and UNEP in support of the nutrient project particularly in relation to capacity strengthening (i.e., scientific trainings and possible provision of laboratory equipment).
- c) ETH, which is currently engaged in the Global TraPs (**Trans**disciplinary Processes for Sustainable **Phosphorus** Management) project, will share expertise with Laguna Lake and Chilika Lake, in the form of two graduate students to help develop P-reduction assessments. The Global TraPs focuses on bringing together “science” and “practice” for the sustainable use of P.
- d) UN-Habitat’s efforts in mobilizing resources in Africa, India and South Asia were recognized.
- e) FAO will be able to share all information relevant to the project.
- f) The significance of the GPNM in bringing in more partners was recognized.
- g) Information sharing among partners (e.g., policy briefs developed by the China Agricultural University can be uploaded in the GPNM website and the methodology on national assessment relevant to nutrient enrichment can be shared; case studies presented in inception workshop can be shared)
- h) UPMSI mentioned about the ongoing partnership with DHI (Singapore) on model development. DHI has agreed to provide the software for the watershed models and expressed interest in providing support for field experiments in looking at specific processes as inputs to the models

Administrative and financial matters

Project implementation and work plan

62. The PSC Meeting agreed that:

- 62.1 The project will be implemented over a 3 year period (i.e., April 2012-March 2015).
- 62.2 The work plans and budgets were agreed to in principle. Component leaders will prepare their respective concept notes, work plans and budgets for submission to UNEP. UNEP will circulate the materials to the PSC for final approval.
- 62.3 Component leaders will refine their respective budgets, with due consideration to the co-financing and the changes in their work programs. The involvement and interests of new partners will be included as the project progresses.
- 62.4 For co-financing, tracking will start as of the GEF project approval in August 2011. The co-financing will calculate the contributions from all partners, including person allocation for the project. The tracking document will be shared by Dr. Datta and the report on co-financing will form part of the progress reports.

- 62.5 The project inception report should be ready by end of April. The inception report will include the revised work plan and budget, and outcomes of the inception workshop.
- 62.6 Quarterly progress and financial reports will be submitted following the format and requirements of UNEP.
- 62.7 The mid-term review will be conducted around August-September 2013 (i.e., 18 months after start of project). The mid-term review will follow the GEF external and independent review process.
- 62.8 Component leaders will identify the delivery of outputs prior to the midterm review in the respective work plans.
- 62.9 The PSC and the GPNM Steering Committee are two separate bodies. The PSC looks into the implementation of the project while the GPNM looks on broader nutrient management activities. Membership in the two bodies will be identified.
- 62.10 The PSC will meet annually during the project implementation.
- 62.11 UNEP will issue contracts to the component leaders through a Project Cooperation Agreement detailing objectives, activities, deliverables, budget and legal implications. It is anticipated that some contracts will be in place by end of April. The component leaders on the other hand are responsible to enter into agreements with partners at the component level (e.g., IOC-UNESCO with UPMSI, WSU, UU, etc). The component leaders will be responsible for the submission of progress and financial reports to UNEP.
- 62.12 The TOR for each of the components will be developed following the submission of the revised work plans and budgets. UNEP will share its template for the Project Cooperation Agreement.
- 62.13 Dr. Datta will circulate the concept note for the communication plan and strategy as part of the meeting report for comments.
- 62.14 The next annual PSC meeting will take place in February 2013, after the submission of the 1st annual report and will be hosted by Monaco or Copenhagen.

Closing

- 63. Dr. Domingo Bravo of DENR Region IVA thanked the participants on behalf of DENR, for selecting Manila Bay as a pilot site for the project. Dr. Bravo mentioned that the outputs of the project will be very useful in other areas of the Philippines with similar problems. Under the ICM scaling up program, replication of the best practices generated from the project can be facilitated.

64. Mr. Kaj Sanders of MIE Netherlands noted that the project has selected the right region to showcase. He expressed appreciation to the participants for generously contributing their ideas and insights. He also commended the Secretariat for efficiently organizing the meeting.

65. Dr. Anjan Datta of UNEP thanked DENR and PRF, the component leaders and the stakeholder for their time and for actively participating in the discussions and deliberations. Dr. Datta attributed the success of the meeting to the collective efforts of the organizers and the participants.

Annex 1
PROVISIONAL AGENDA

**GLOBAL FOUNDATIONS FOR REDUCING NUTRIENT ENRICHMENT AND
OXYGEN DEPLETION FROM LAND BASED POLLUTION, IN SUPPORT OF
GLOBAL NUTRIENT CYCLE**

***Inception Workshop and
Project Steering Committee (PSC) Meeting***

***27- 29 March 2012
Crowne Plaza Hotel, Manila, Philippines***

PROVISIONAL AGENDA

27 March, Tuesday

Venue: Sapphire A

08:30 - 09:00 Registration

Inception Workshop

Chair: *Atty. Analiza Rebuelta-Teh*
Undersecretary, Department of Environment and Natural Resources

09:00 – 09:30 Welcoming Remarks

- Atty. Analiza Rebuelta-Teh
Undersecretary, Department of Environment and Natural Resources
Philippines
- Mr. Kaj Sanders
Senior Policy Advisor, Ministry of Infrastructure and the Environment
The Netherlands
- Dr. Anjan Datta
UNEP
- Prof. Raphael P.M. Lotilla
Executive Director, PEMSEA

09:30 – 09:40 Introduction of speakers and guests

09:40 – 09:50 Meeting objectives

09:50 – 10:10 Introduction of the Project (background, components and their linkages,
institutional arrangements, key deliverables, relevance of the project in
light of the outcomes of the GPA/IGR3)
Dr. Anjan Datta, UNEP

10:10 – 10:30 Preliminary Assessment of Hypoxia in Manila Bay
Dr. Gil Jacinto
Marine Science Institute, University of the Philippines

10:30 – 11:00 Coffee Break

11:00 – 12:30 Stakeholder Remarks on the Proposed Project's Objectives and Expectations in the Context of Manila Bay Rehabilitation

- *Hon Presbitero Velasco, Jr, Supreme Court Justice.*
- *Dr. Elisea Gozun, Presidential Advisor for Climate Change
Manila Bay Advisory Committee, Philippines Supreme Court*

- *Mr. Joel S. Rudinas
Undersecretary for Field Operations
Department of Agriculture*

- *Mr. Roland Acosta
Assistant Secretary, Bureau of Local Government Supervision
Department of the Interior and Local Government*

- *Ms. Dolora Nepomuceno
Assistant General Manager, Laguna Lake Development Authority*

- *Mr. Ramon Alikpala
Chairman, Metropolitan Waterworks and Sewerage System*

- *Mr. Raymund P. Ilustre
President & COO, Atlas Fertilizer Corporation*

- *Mr. Reynulfo A. Juan
OIC- DENR Regional Executive Director, Region 4A*

- *Mr. Nilo B. Tamoria
DENR Regional Executive Director, NCR*

Reaction from PSC Chair / GPNM Steering Committee Chair and members

12:30 – 13:30 Lunch Break

PSC Chair: Mr. Kaj Sanders
Senior Advisor, Ministry of Environment, Netherlands
GPNM Steering Committee Chair

13:30 – 15:30 Overview of the Ongoing Programs and Projects in Manila Bay

- *Profile of Manila Bay and its Watershed, including nutrient reduction policy, programs and practices*

- *Sewerage and Sanitation Master Plan in Metro Manila
Ms. Leonor Cleofas, MWSS Deputy Administrator*
- *Operational Plan for the Manila Bay Coastal Strategy (OPMBCS)
Mr. Noel Gaerlan, Executive Director, Manila Bay Coordinating
Office*
- *Assessment of Nutrient Loading from Cropland Systems in Manila
Bay
Ms. Edna Samar, Division Chief, Soil & Water Resources
Research Division, BSWM*
- *Pasig River Rehabilitation Program
Engr. Richard Penaflo, Deputy Executive Director, Pasig River
Rehabilitation Commission (PRRC)*
- *Laguna Lake Environmental Management Program
Ms. Adelina Santos-Borja, OIC – RMDD, LLDA*
- *Total Pollutant Loading in Laguna Lake-Pasig River-Manila
Bay/Laguna Lake and the Meycauayan-Marilao-Obando River
System
Mr. Emeterio Hernandez, OIC, Project Development, Mgmt. and
Evaluation Division, LLDA*

15:30 -15:35 Assemble at the hotel lobby for transfers to Cultural Center of the
Philippines Complex

16:45 –19:00 Manila Bay cruise and Welcome Dinner

28 March, Wednesday

Venue: Sapphire A

PSC Meeting

PSC Chair: Mr. Kaj Sanders
Senior Advisor, Ministry of Environment, Netherlands
GPNM Steering Committee Chair

09:00 – 09:15 Meeting Agenda and Work Schedule

09:15 – 12:00 Planning workshop for the 4 project components

Each lead agency will present the workplan and schedule of outputs,
Indicating activities, key deliverables and any linkages with other
components and overall project outputs.

Component B: Quantitative analysis of relationship between nutrient sources and impacts to guide decision making on policy and technological options

IOC and partners

Component C: Establishment of scientific, technological and policy options to improve coastal water quality policies in LMEs and national strategy development

GETF

Component D: Development of nutrient reduction strategies through application of quantitative source-impact modeling and best practices in Manila Bay watershed and Chilika Lake

PEMSEA and partners

- *Water Quality Monitoring in Laguna de Bay and Pasig River
Ms. Jocelyn G. Sta. Ana , OIC , Environmental Quality Division
and Research Division, LLDA*
- *Integrated Information Management System for the Manila Bay
Area
Ms. Bresilda Gervacio, PEMSEA*

Chilika Lake

Dr. N. Raghuram

Component A: Global Partnership on Nutrient Management addressing causes and impacts of coastal nutrient over-enrichment and hypoxia

UNEP

12:00 – 13:30 Lunch Break

13:30 – 14:30 Continuation of workshop

14:30 – 16:30 Plenary discussion

16:30 – 17:00 Synthesis and wrap up

29 March, Thursday

Venue: Sapphire A

09:00 – 10:30 Presentation of final project work plans and revised budgets
(Components A to D)

10:30 – 10:45 Coffee Break

10:45 – 12:00 continuation

12:00 – 13:30 Lunch Break

13:30 – 15:30 Discussions on:

- Administrative and financial procedures (e.g., co-financing, tracking, reporting, etc.)
- Communication and outreach strategy for the project and GPNM in general
- Announcement of other events of relevance and importance and GPNM involvement
- Date of next meeting, venue and host
- Any other business
- Approval of the work plan and budget for Year 1
- Summary of Agreements

15:30 – 15:45 Coffee Break

15:45 – 16:45 Continuation of discussion

16:45 – 17:00 Closing

Annex 2
LIST OF PARTICIPANTS

**Inception Workshop and Project Steering Committee Meeting of the Global
Foundations for Reducing Nutrient Enrichment and Oxygen Depletion from Land
Based Pollution, in Support of Global Nutrient Cycle
Manila, Philippines, 27-29 March 2012**

LIST OF PARTICIPANTS

INTERNATIONAL PARTICIPANTS

China Agricultural University

Prof. Zhang Fusuo
Director
Centre for Resources, Environment and
Food Security
China Agricultural University, Beijing
No. 2 Yuanmingyuan West Road
Haidan District, Beijing 100193
Tel: (+86) 1062732499
Fax: (+86) 1062731016
Email: zhangfusuo@gmail.com
Email: zhangfs@cau.edu.cn

ETH Zurich

Prof. Dr. Roland W. Scholz
Full Professor
ETH Zurich
Institute for Environmental Decisions,
Natural and Social Science Interface
Universittstrasse 22, CHN J76.1
8092 Zrich, Switzerland
Tel: +41-44-632 58 92 / 96
Fax: +41-44-632 10 29
Email: rolad.scholz@env.ethz.ch

FAO

Dr. Christian Nolte
Senior Officer
Soil Health and Integrated Plant
Nutrition Management
Plant Production and Protection Division,
AGPME team
Food and Agriculture Organization
Viale delle Terme di Caracalla 1
00153 Rome, Italy
Tel: (+39) 06-570 53810
Skype: christian.nolte.fao.agpme
Email: Christian.Nolte@fao.org

GETF

Mr. Chuck Chaitovitz
Principal
Global Environment & Technology
Foundation
2900 South Quincy Street
Suite 375, Arlington, VA 22206
USA
Tel: (1-703) 379-2713
Email: chuck.chaitovitz@getf.org

**Guru Gobind Singh Indraprastha
University**

Prof. Nandula Raghuram
Associate Professor
Guru Gobind Singh Indraprastha
University
School of Biotechnology
Sector 16C, Dwarka, New Delhi 110075
India
Tel: (+91) 11-25302308
Email: raghuram98@hotmail.com

IAEA

Mr. Michel Warnau
Laboratory Head
Environment Laboratories
International Atomic Energy
Organization
4A Quai Antoine 1ER, 98000
Monaco
Tel: (377) 9797-7278
Fax: (377) 9797-7276
Email: M.Warnau@iaea.org

INI

Mr. Manbir Singh Sachdev
South Asia Coordinator
International Nitrogen Initiative
Member GPNM Steering Committee
INI & GPNM
C-13, 1st Floor, Front Side, Inderpuri
New Delhi 110012
India
Tel: (+91) 11-25833595
Fax: (+91) 11-25833595
Email: sachdevms@gmail.com

IOC/UNESCO

Dr. Henrik Oksfeldt Enevoldsen
Head of Centre
IOC Science and Communication
Centre on Harmful Algae
IOC/UNESCO University of
Copenhagen
Marine Biological Section
Oster Farimagsgade 2D
1353 Copenhagen K
Denmark
Tel: (+45) 331-34446
Email: h.enevoldsen@bio.ku.dk

Ministry of Infrastructure & the Environment

Mr. Kaj Sanders
Senior Policy Advisor
Ministry of Infrastructure and the
Environment
Environmental Protection Office
Directorate for Sustainability
Plesmanweg 1-6
P.O. Box 20901
2500 EX The Hague
The Netherlands
Tel: (+31)652740177
Email: kaj.sanders@minienm.nl

UNEP

Dr. Anjan Datta
Programme Officer
GPA Coordination Unit
United Nations Environment Programme
P.O. Box 30552
00100 Nairobi
Kenya
Email: Anjan.Datta@unep.org

Dr. Isabelle Vanderbeck
UNEP GEF IW Task Manager
United Nations Environment Programme
900 17th Street N.W.
Washington DC
USA
Tel: 1-202-974-1314
Email: isabelle.vanderbeck@unep.org

UN-HABITAT

Dr. Bhushan Tuladhar
Regional Technical Advisor-South Asia
Water for Asian Cities Programme
UN-HABITAT
P.O. Box 107
Pulchowk, Lalitpur, Nepal
Tel: + 977 1 5542816
Fax: + 977 1 5539877
Email:
bhushan.tuladhar@unhabitat.org.np

USDA

Dr. Gregory Lee Crosby
National Program Leader, Sustainable
Development
US Department of Agriculture
National Institute of Food and
Agriculture
AgBox 2210, Waterfront Center
Rm 3188, 1400 Independence Avenue,
SW, Washington, DC 20250
USA
Tel: (1-202) 401-6050
Fax: (1-202) 401-1706
Email: gcrosby@nifa.usda.gov

PHILIPPINE PARTICIPANTS

Supreme Court of the Philippines

Atty. Risa Halagueña
Supreme Court
Manila Bay Advisory Committee
Padre Faura St., Ermita, 1000 Manila.
Fax: 523-7385
Email: risa.halaguena@gmail.com

Office of the President

Dr. Elisea Gozun
Presidential Assistant II for Climate
Change
Office of the President
Malacanang Palace Compound
New Executive Building
J.P. Laurel St., San Miguel
Manila
Tel: (632) 735-6201
Email: bggozun@gmail.com

DA BFAR

Mr. Juan Relox Jr.
Head Marine Biotoxins Monitoring
Section
BFAR
DA Compound Elliptical Road
Diliman Quezon City
Email: reloxj@gmail.com

Mr. Marc Lawrence Romero
Aquaculturist I
BFAR
DA Compound Elliptical Road
Diliman Quezon City
Tel: 3320210

DA BSWM

Ms. Edna Samar
Division Chief
Bureau of Soils and Water Management
Soil and Water Resources Research
Division
Department of Agriculture

SRDC Building, Elliptical Road cor.
Visayas Ave., Diliman, Quezon City
Tel: (632) 920-4378
Email: edsamar@yahoo.com

DENR

Atty. Analiza Rebueta-Teh
Undersecretary and Chief of Staff
Department of Environment and Natural
Resources
DENR Compound, Visayas Avenue,
Diliman, Quezon City
Tel: +63 2 925-2327 / 9268074
+63 2 929 6626/29 local 2055
Fax: +63 2 926 8065
E-mail: tehanna08@gmail.com

Mr. Nilo B. Tamoria
Regional Executive Director - NCR
Department of Environment and Natural
Resources
DENR by the Bay, 1515 L & S Building,
Roxas Boulevard, Ermita
Manila,
Tel No. (632) 522-4768; 522-2596;
440-9977
Fax No. (632) 522-4769; 434-0119
Email: ncr_ored@yahoo.com

Mr. Noel Gaerlan
Executive Director
Manila Bay
Department of Environment and Natural
Resources
DENR Compound Visayas Avenue
Diliman, Quezon City
Tel: (32) 9281225

Mr. Jacob Meimban, Jr.
Executive Director
Coastal and Marine Management Office
Protected Areas and Wildlife Bureau
Department of Environment and Natural
Resources
Ninoy Aquino Parks and Wildlife Center,
1100 Diliman Quezon City
Tel +632 9246031 to 35 local 207
Fax +632 9258948
email: cmmo@pawb.gov.ph

Ms. Araceli Oredina
Chief, Planning Division
DENR
Visayas Avenue Diliman
Quezon City
Tel: 09173283101
Email: aoredina@yahoo.com

Dr. Domingo Bravo
Chief, Science Research Specialist
Site Management Office
DENR – R4A CALABARZON
Vencris building
National Highway Brgy Halang
Calamba City
Tel: 049-5026668/02-8694864
Fax: 049-5026668
Email: dr_bravo2006@yahoo.com

Mr. Arthur Salazar
OIC
DENR R-3
Diosdado Macapagal Government
Center, Maimpis
San Fernando, Pampanga

Mr. Jhun Barit
Forester I
DENR – R3
Diosdado Macapagal Government
Center, Maimpis
San Fernando, Pampanga

Mr. William De Cello
Technical Assistant
DENR-NCR
Nursery, North Avenue
Quezon City
Tel: 09297830045

Ms. Erlinda Gonzales
Manila Bay Office – EMB
DENR Compound
Visayas Avenue, Diliman
Quezon City
Email: erlinda_a_gonzales@yahoo.com

LLDA

Ms. Adelina C. Santos-Borja
Officer-in-Charge
Resource Management and
Development Department
Head, Carbon Finance Unit
Laguna Lake Development Authority
4th floor, Annex Building
Sugar Regulatory Administration
North Avenue, Quezon City
Email: lennieborja@yahoo.com;
lennieborja@llda.gov.ph

Ms. Jocelyn G. Sta. Ana
OIC
Environmental Quality Division and
Research Division
Laguna Lake Development Authority
4th Floor, Annex Building
Sugar Regulatory Administration (SRA)
Compound
North Avenue, Diliman, Quezon City
Tel: 2866143
Email: jgs_llda@yahoo.com.ph

Mr. Emitterio C. Hernandez
Officer-In-Charge
Project Development, Management and
Evaluation Division
Resource Management and
Development Department
Laguna Lake Development Authority
Sugar Regulatory Authority (SRA)
Compound, North Avenue,
Quezon City
Tel: (02) 377-8845 (Office);
Mobile: 0919 612 0957
Email: emitzky@gmail.com

Ms. Carolane P. Gonzales
Laguna Lake Development Authority
2nd Floor, Annex Building,
Sugar Regulatory Administration (SRA)
Compound, North Avenue,
Diliman, Quezon City, Metro Manila
Tel: 3778845
Email: potchiky@yahoo.com

Ms. Rochelle Ivy Reyes
ENGR II
Laguna Lake Development Authority
2nd Floor, Annex Building,
Sugar Regulatory Administration (SRA)
Compound, North Avenue,
Diliman, Quezon City, Metro Manila
Tel: 3778845
Email: r_ivy_r@yahoo.com.ph

Manila Water Company

Mr. Mark Tom Q. Mulingbayan
Manager
Environment Department
Operations Group
Manila Water Company
MWSS Admin. Bldg., Katipunan Road
Balara, Quezon City 1105
Tel: (632) 9175900 loc. 1301
Fax: (632) 9285762
Email:
mark.mulingbayan@manilawater.com
Mark.mulingbayan@yahoo.com

Maynilad

Mr. Frankie Arellano
Senior Vice President
Head for Environmental Management
Maynilad
MWSS Compound Katipunan Avenue
Quezon City
Tel: 981-3333
Email:
frankie.arellano@mayniladwater.com.ph

Mr. John Emmanuel Martinez
Environmental Officer
Maynilad
MWSS Compound Katipunan Avenue
Quezon City

MWSS

Mr. Ramon Alikpala
Chairman
Metropolitan Waterworks and Sewerage
System
MWSS Complex, Katipunan Road
Balara, Quezon City

Tel: (632) 9285691
Fax: (632) 9202439
Email: rbalikpala@gmail.com

Ms. Leonor C. Cleofas
Deputy Administrator
Metropolitan Waterworks & Sewerage
System
MWSS Complex, Katipunan Road
Balara, Quezon City
Tel: (632) 9285691
Fax: (632) 9202439
Email: bcleofas@gmail.com

Engr. Rebecca de Vera
Project Management Officer A
Metropolitan Waterworks & Sewerage
System
MWSS Complex, Katipunan Road
Balara, Quezon City

PRRC

Engr. Richard Penaflor
Deputy Executive Director
Pasig River Rehabilitation Commission
(PRRC)
5th Floor, Triumph Building
1610 Quezon Avenue, Quezon City
Tel: (632) 926-5234; 926-6445
Telefax: (632) 926-5232
Email: pasiolahin@yahoo.com.ph

UP-MSI

Dr. Gil Jacinto
Professor
Marine Science Institute
University of the Philippines
Velasquez Street
Diliman, Quezon City
Email: gjacinto@gmail.com

Dr. Cesar L. Villanoy
Associate Professor
Marine Science Institute
University of the Philippines
Velasquez Street
Diliman, Quezon City
Email: c.villanoy@gmail.com

Ms. Lara Patricia Sotto
Research Assistant
Marine Science Institute
University of the Philippines
Velasquez Street
Diliman, Quezon City
Tel: 3939924
Email: lpasotto@upmsi.ph

OBSERVER

ADB

Ms. Nell Williams
Agriculture, Rural Development and
Security
Asian Development Bank
ADB Avenue
Ortigas, Pasig City
Tel: 09267093114
Email: nell.marie.williams@gmail.com

PEMSEA Secretariat

Prof. Raphael P.M. Lotilla
Executive Director
Email: rlotilla@pemsea.org

Mr. S.A. Ross
Chief Technical Officer
Email: saross@pemsea.org

Ms. Nancy Bermas
Sr. Country Programme Manager
Email: nbermas@pemsea.org

Mr. Robert S. Jara
Programme Specialist
Email: rsjara_121@yahoo.com

Ms. Bresilda Gervacio
IIMS Specialist
Email: bgervacio@gmail.com

Ms. Melissa Elsa Cruz
Corporate Special Responsibility
Specialist
Email: mcruz@pemsea.org

Ms. Daisy Padayao
Technical Assistant - Project
Development
Email: dpadayao@pemsea.org

Ms. Caroline Velasquez
Executive Associate
Email: cvelasquez@pemsea.org

Ms. Elsie Merina
Programme Assistant
Email: emerina@pemsea.org

Mr. John Christian Castillo
Artist
Email: jcastillo@pemsea.org

Ms. Jane Andal
Research Assistant
Email: jandal@pemsea.org

Visiting Address:
PEMSEA Office Building
DENR Compound, Visayas Avenue
Quezon City, Philippines
Mailing Address: P.O. Box 2502
Quezon City, 1165,
Philippines
Telephone : (632) 929-2992
Fax : (632) 926-9712
Website : www.pemsea.org

