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# Regional initiatives for interlinking global coastal scientific research projects

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### ABSTRACT

LOICZ (Land Ocean Interactions in the Coastal Zone) (see <http://www.loicz.org/>) is a core research project of International Geosphere Biosphere Program (IGBP) (and previously also the International Human Dimensions Program (IHDP) involving scientists from across the globe investigating biogeochemical as well as social, economic and governance related coastal zone research. Since 2003, its focus on human dimensions allows better informing the scientific community, policymakers, managers and other stakeholders on the relevance of global environmental change in the coastal zone. LOICZ has six existing regional nodes: in South Asia (Chennai, India), Southeast Asia (Singapore), East Asia (Yantai, China), Latin America (Rio de Janeiro) and North America (Louisiana, USA). The four upcoming nodes include Arctic (Canada), West Africa (Nigeria), Caribbean (Trinidad & Tobago) and China (Taiwan). Each regional node coordinates and promotes global change research at the regional and local level as well as facilitates links and exchanges between international, national and local science and policy.

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Building on the platform provided by Future Earth for global sustainability research (see <http://www.futureearth.org/>), LOICZ, with its transition to Future Earth Coasts, recognizes the continuing need to address the 'hotspots' of coastal urbanization, deltas, small islands and the Arctic as well as cross-cutting themes such as coastal governance, but in the context of: (i) Dynamic coasts, (ii) Human development and the coast and (iii) Pathways to global coastal sustainability, with a focus on critical research questions under each inter-related theme. Within these themes, Future Earth Coasts will continue to 'do' science and produce science products that would enable resilient and sustainable outcomes in coastal regions. Future Earth Coasts will seek partnerships with intergovernmental and non-governmental organizations with similar interests and aspirations to design, produce and implement needed knowledge (including disciplinary, inter- and trans-disciplinary science) to foster coastal sustainability.

It is in this context that, representatives of LOICZ and SCOPE (Scientific Committee on Problems of the Environment) (see <http://www.scopenvironment.org/>) met in Chennai, India in December 2014. SCOPE is a non-governmental organization established in 1969, and its mission is to identify and provide scientific analyses of emerging environmental issues that are caused by or affect humans. It reviews current understanding of environmental issues and provides assessments for research, policy, and development needs. SCOPE's current activities are rapid assessment projects, an annual forum on environmental issues, awards to acknowledge established and early career scientists as well as *Environmental Development*, the quarterly journal brought out since 2011 in partnership with Elsevier.

The SCOPE–LOICZ meeting was conducted back to back with a LOICZ Regional Nodes Workshop in Chennai. LOICZ regional nodes vary in their scientific focus and approaches (e.g. nutrient budget in South Asia etc.) to understand the state of the coast. One proposal of the Regional Nodes Workshop was building better regional understanding and capacity to realise coastal resilience and sustainability outcomes. A core activity that engages and mobilises the LOICZ network of regional nodes could be initiated by focussing on coastal sustainability indicators, which can be used for regional assessments, and as a foundation for management/response actions towards regional coastal resilience and sustainability. These assessments will form the basis of a major new initiative of Future Earth Coasts to produce a regionally informed global State of the Coast report, with supporting capability building tools and guidance, to be completed by 2020.

The Chennai meeting allowed LOICZ and SCOPE to explore opportunities for sharing the strengths and experience within their respective programmes and networks as well as to identify potential areas for future cooperation and networking. SCOPE with its global network has experience in the conduct of scientific programs that while responding to regional needs and priorities can deliver insights of global significance. Its rapid assessments of key environmental issues are designed to link research outputs to end users. Of special interest to the proposal from the Regional Nodes Workshop mentioned above are SCOPE's activities and experience in sustainability indicators and in communicating global change science to society. Of added advantage is also SCOPE's experience in providing inputs into other international analyses, notably the UNEP Year Books by way of contribution of network experts to development of the emerging environmental issues sections.

LOICZ–SCOPE cooperation could begin with a pilot rapid regional assessment project in one or more regions. An example is the one being proposed by the LOICZ South Asia regional node. The project will initially address the coastal vulnerability and resilience issues along the Indian coast. India has 7500 km long coastline and its coastal and marine areas harbour some of the unique and diverse ecosystems and their resources. The large population located along the coast (about 25% of total population) depends on these natural resources for their livelihood. Despite their ecological richness and the recognition of their economic potential for national development, India's coastal and marine areas have not received adequate protection. They are under stress from coastal erosion, inundation, industrial pollution, sewage disposal, resource exploitation and related habitat destruction. The Indian coast is also subject to extreme weather events, such as cyclones and storm surges causing significant loss of lives and property, again among the rural coastal communities with low resilience to extreme weather variability. Climate change aggravates the risks to coastal communities and infrastructure. All this diminish the ability of coastal and marine systems to support the livelihoods of coastal populations already under stress due to poverty and marginalization.

The coastal and marine waters are also potential areas for development which is being further promoted on a large scale by the Government in order to meet the economic aspirations of the country. Economic development without adequate consideration of its impact on the environment will further exacerbate these problems. Until now, the approach to managing India's coastal zone was purely regulatory based on the Coastal Regulation Zone (CRZ) Notification of 1991, promulgated under the Environment (Protection) Act of 1986. This approach did not provide for consultation with coastal communities and convergence of multiple developmental activities along the coast. A major recommendation was to adopt an integrated coastal zone management (ICZM) approach that would, with people's participation, promote the livelihood security of the coastal communities, and protect the ecosystems while promoting sustainable development for better management of coastal areas.

This proposed regional pilot project will take into account the three core Future Earth Coasts themes of Dynamic coasts, Human development, Pathways to global coastal sustainability, and build upon the recommendations of the Chennai Regional Nodes meeting (development of sustainability indicators and development of a Global State of the Coast report series with supporting guidance for practice) in partnership and building upon the related scientific expertise and experience of SCOPE and its network, together with other partners. By aiming at better understanding of the status of India's coastal social ecological systems, the risks and vulnerabilities involved, using coastal sustainability indicators, the project will inform and identify national priorities and recommendations for action.

The findings of this pilot programme in India will be reviewed, refined and adapted so that regional State of the Coast assessments can be initiated in other regional nodes. Such a regional focus is likely to be of interest to Future Earth, which currently does not have a regional partnership system. These regionally based assessments will be synthesised, integrated and aggregated to develop by 2020 a global State of the Coast report with supporting capability building tools and guidance.

The meetings in Chennai thus opened up the opportunity to build a new partnership between Future Earth Coasts and SCOPE that will deepen understanding about the status of regional coasts and priority issues, and develop and disseminate practical guidelines for promoting regional and ultimately global coastal sustainability.