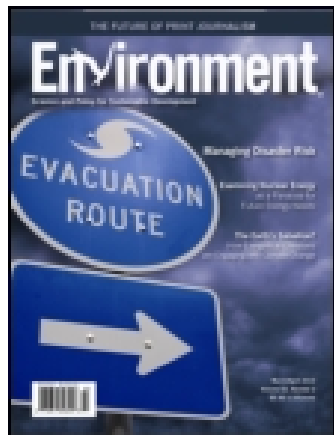


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Environment: Science and Policy for Sustainable Development

Publication details, including instructions for authors and subscription information: <http://www.tandfonline.com/loi/venv20>

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Published online: 23 Jun 2015.

To cite this article: Sylvia Szabo, Fabrice G. Renaud, Md Sarwar Hossain, Zita Sebesvári, Zoe Matthews, Efi Foufoula-Georgiou & Robert J. Nicholls (2015) Sustainable Development Goals Offer New Opportunities for Tropical Delta Regions, *Environment: Science and Policy for Sustainable Development*, 57:4, 16-23, DOI: [10.1080/00139157.2015.1048142](https://doi.org/10.1080/00139157.2015.1048142)

To link to this article: <http://dx.doi.org/10.1080/00139157.2015.1048142>

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Sustainable Development Goals Offer New Opportunities FOR TROPICAL DELTA REGIONS

by Sylvia Szabo, Fabrice G. Renaud, Md Sarwar Hossain, Zita Sebesvári, Zoe Matthews, Efi Foufoula-Georgiou, and Robert J. Nicholls

Marine and lacustrine delta regions constitute only 1% of the Earth's surface but are home to over 500 million people.¹ They are key contributors to agricultural production at the national and regional levels and thus enable alleviation of global food insecurity risks. In addition, tropical megadel-

tas sustain rich ecosystems that provide a variety of services and are noted for high biodiversity and natural resources.² At the same time, however, their geographical location, coupled with often poor land use and river basin management, implies that deltas, more than other coastal areas, are prone to natural hazards and disasters such as subsidence, flooding, coastal erosion, and cyclones/typhoons. These

environmental shocks have been proven to lead to high out migration and threaten human security in already relatively economically poor regions.³ Climate change, in particular sea-level rise, exacerbates the existing vulnerabilities by increasing the risks of rapid-onset disasters, as well as creeping processes such as salinity intrusion.^{4,5} Many deltas around the world are therefore threatened.⁶ This

Agriculture and aquaculture production in the Mekong Delta in Vietnam.



Fabrice G. Renaud



Deltas are global intensive food production areas.

exposure to environmental change has important consequences on people's livelihoods and human development of the delta regions and beyond. In the case of the Amazon delta, the state-level human development index of the Brazilian State of Pará, where most of the delta area is located, is the third lowest among the 27 Brazilian states, with the education subindex ranking second poorest.⁷

In this commentary we discuss new opportunities for the way that the proposed Sustainable Development Goals (SDGs) agenda interacts with delta regions and highlight key policy measures needed to address the existing gaps.

The proposed SDGs present clearly a number of concrete opportunities for tropical delta regions (Table 1). First, they constitute a move in the right direction

by recognizing climate change among the key priorities, along with an explicit recognition of inequality as one of the major obstacles to sustainable development. This is an important addition to the poverty eradication goal, which is of crucial importance to delta regions. The proposed SDGs also mention the right to environmental protection and the need to integrate socioeconomic and



Table 1. Proposed SDG Targets Present Important Opportunities to Overcome Developmental Obstacles in Tropical Delta Regions

Delta-Specific Challenges	Delta-Relevant SDG Goals and Targets
Vulnerability to disasters and climate-related extreme events	T 1.5) By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.
Soil degradation and agricultural loss exacerbated by climate change	T 2.4) By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality.
Poor regulation of food commodity markets	T 2.c) Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.
Lack of efficient transboundary cooperation in water management	T 6.5) By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.
Water and soil salinization	T 6.a) By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.
Poor regional infrastructure and connectivity	T 9.1) Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.
Out migration	T 10.7) Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies.
Human loss and economic damage due to natural and anthropogenic disasters	T 11.5) By 2030, significantly reduce the number of deaths and the number of people affected and decrease by [x] percent the economic losses relative to gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.
Poor adaptation and mitigation strategies to climate change in cities	T 11.b) By 2020, increase by [x] percent the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, develop and implement, in line with the forthcoming Hyogo Framework, holistic disaster risk management at all levels.
Disproportionate negative impacts of climate change	G 13) Take urgent action to combat climate change and its impacts.

(continued)

Table 1. (Continued)

Delta-Specific Challenges	Delta-Relevant SDG Goals and Targets
Depletion of natural fish stock	T 14.4) By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.
Vulnerability of coastal and marine areas	T 14.5) By 2020, conserve at least 10 percent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.
Land degradation	T 15.3) By 2020, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world.

Note. In column 2, "T" followed by a number refers to the SDG target, and "G" refers to an SDG goal.

environmental aspects of development at national and regional scales. Moreover, the importance of subnational differences and the need for location specific disaggregated data are explicitly acknowledged,⁸ which opens the door

for a contextualized approach. The targets are more comprehensive than those under the MDGs and cover in greater depth the three pillars of sustainable development.^{8,9} In particular, the environmental dimension of development

is strengthened throughout the existing post-MDG agenda.⁹ Thus, the proposed SDGs offer the opportunity for tailor-made development pathways, for example, for deltaic systems with their specific challenges and opportunities.

Hybrid solutions to protect against coastal hazards.





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Mangrove forest.

These are all welcomed advancements in terms of relevance to the challenges faced by populations of tropical deltas. More specifically, target 1.5, which by 2030 aims to “build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters,”⁸ is highly relevant for delta environments.¹ The inclusion of targets supporting sustainable agriculture within the SDGs, together with other measures aimed at ensuring the proper functioning of food commodity markets and limiting extreme food price volatility (target 2.c), is a welcome addition. It is particularly important for the farmers, who often suffer from economic loss because of

unfair price regulations and practices.¹⁰ Furthermore, target 14.5 represents an important opportunity for delta regions. By aiming to conserve at least 10% of the coastal and marine area, this objective is likely to contribute to the reduction of environmental degradation in tropical deltas, which has been shown to be a significant obstacle to developmental progress of tropical deltas.¹¹

In order for these opportunities to be realized, a number of conditions should be fulfilled. First, while linking social and environmental aspects of development is laudable, a key concern is how to ensure that this principle is implemented by national and local policy makers. A recent example is the Rampal Power Station development in the mangrove forest of the Sundarbans,

which is being carried out despite the environmental impact assessments and opposition from civil society. Second, while new delta level indicators might be difficult to incorporate into the SDGs, existing tools could be used to monitor socially and ecologically sustainable development in the deltas, such as the global delta vulnerability index, currently being developed as part of the Belmont Forum project. Third, regarding specifically the target on land degradation, indicators should allow monitoring different components of land degradation, such as salinization and coastal erosion. Fourth, although the establishment of an annual reserve potentially to be managed by the Green Climate Fund is laudable, it should be accompanied by structured monitoring

mechanisms and access to funding based on a set of integrated criteria, possibly taking into account a regional vulnerability index. Finally, the recognition that social inequalities can be exacerbated by climate-induced vulnerabilities constitutes an important advancement in the proposed SDG agenda.⁹ In this context, it would be crucial for national administrations to align delta specific developmental plans and policies to SDG indicators. Given high out migration from some rural delta regions,^{3,12} caused by environmental and economic push factors, sustaining livelihoods of both farmer and urban communities in tropical deltas is of crucial importance.

Given the facts that many deltas are rapidly transforming, often with negative environmental, social, and



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The Sundarbans in the Bengal region of Bangladesh and Eastern India, a UNESCO World Heritage Site.

A fisherman paddles his wooden fishing boat through the Bengal delta canals in the Sundarbans.



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Deltas are a major provisioner of ecosystem services.



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economic consequences, and that delta environments are particularly vulnerable to the consequences of climate change, the SDGs will not allow addressing the delta development challenge if there is a failure to generate disaggregated data for the quantification of the targets. Generation of disaggregated data is a priority of the United Nations⁹ under its push for a “data revolution,” including accessible and desegregated measures. The implication of such a data revolution is that targets need to be as explicit as possible and guidelines for their characterization should accompany the formulation of the goals.

If this can be achieved, landscapes such as deltas can be monitored and policies can be tailor-made to improve progress against specific targets. The risk of failing to adopt this approach would be one of increase in differential development between regions, whereas the overall aim should be one of improving social, economic, and environmental conditions in all geographical areas. As deltas are particularly vulnerable landscapes but, in many cases, of great importance in terms of the impact of ecosystem services on human well-being, countries should be provided with the tools to track progress against the SDGs at the

delta scale. Failure to do this could imply missed development opportunities for many delta regions and beyond. We therefore support the Sustainable Delta Initiative¹ and the call by Giosan et al.⁶ for a science-based global strategy for protecting deltas. We urge the scientific community to expand and align research agendas in order to identify the best available mechanisms to track deltas’ SDG progress in the years to come.

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A delta on the Caribbean coast of Honduras.

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This research is part of the BF-DELTA project “Catalyzing action towards sustainability of deltaic systems” funded by the Belmont Forum (grant number NE/L008726/1), and it contributes to the International Council of Science (ICSU) “Sustainable Deltas 2015” Initiative, which aims to increase awareness, research collaboration, and data/model sharing toward delta sustainability. We thank many colleagues who contributed to the ideas in this commentary, including during the Deltas in Times of Climate Change conference and stakeholder engagement workshops conducted in Dhaka and Ho Chi Minh City.

NOTES

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