CASE STUDY

The Maldives: Leveraging Public Budgets for Coastal Adaptation Projects that include Land Reclamation

Background Information

The Maldives, an atoll island chain consisting of 1,192 islands in the middle of the Indian Ocean, are at high risk from rising sea-levels with a maximum elevation of 2.4m above mean sea-level. More than 44 per cent of settlements and 70 per cent of all critical infrastructure are located within 100 meters of shoreline, which makes them highly vulnerable to flooding and coastal erosion. Climate change induced sea-level rise will increase extreme levels due to storm surges and swell waves, exposing islands population, infrastructure and livelihood assets to increasing flood risk.

Through social changes, there are high rates of urbanization and migration, additional to the general population growth. The capital, Malé, faces challenges housing one third of the national population of 300,000 people on only 2.3 km^2 of land, making it one of the most densely populated cities in the world.

To overcome the population pressure and to respond to increasing threats posed by natural disasters, coastal adaptation in the Maldives is key. Land reclamation presents a great potential for revenue generation that can be used for coastal adaptation.

Indeed, while coastal adaptation is economically beneficial particularly in densely populated urban areas, these opportunities are often not realised due to the high upfront costs and scarce public resources for adaptation. Public actors, the dominant investors in coastal adaptation, currently cover only a fraction of needed coastal adaptation investments globally, and an even smaller share in developing countries (CPI, 2015). Public financing constraints can be overcome by investing in projects integrating coastal adaptation and land reclamation or urban land redevelopment because the public actor can generate revenues through selling or leasing the newly available land (Bisaro et al., 2018). In urban settings, such as Malé in the Maldives, land values are sufficiently high for generating either market or tax revenues to fund coastal adaptation measures.

Approach, Delivery, & Challenges

Since the Maldives and especially Malé, the capital, comply with requirements for leveraging of public finance, land reclamation is a win-win. The Maldivian atolls provide opportunity for reclaiming new islands because of their shallow depths and the proximity of abundant sediment needed for land fill (MEE, 2015). Raising new islands to sufficient height provides valuable new land at a greater flood safety standard than existing islands.

A major land reclamation project, raising the new island of Hulhumalé, was initiated by the Government of the Maldives in 1997 to address land scarcity. Located near Malé, the project currently provides an additional 2 km^2 of urban land, with 7 km^2 planned by 2040 (Magnan et al., 2016). Hulhumale was built by dredging sand and claiming land from the sea. Hulhumalé is raised 2.1 m above sea-level, which is 0.6 m higher than the average height in Malé and creates new land for the urban population at lower flood risk exposure. Combined with high value real estate development it generates revenues to pay for the initial investments.

During the initial phase of the project – Phase I from 1997 to 2004 – 185 hectares were reclaimed for predominantly residential uses, including infrastructure, such as roads, schools and mosques. Phase II (2006-2016) reclaimed an additional 240 hectares also for residential use, of which 30 per cent for social housing (GoM, 2008).

At the last census, the population of Hulhumalé was 15,769 (NBS, 2014). The Housing Development Corporation (HDC) gives a target of 60,000 people living on Hulhumalé by 2020, and 146,000 by 2040 (HDC, 2017), effectively doubling the population of the greater Malé area.

Phase I was financed entirely from the national state budget for a total cost of US$32 million. For Phase II, implemented by the state-owned Housing Development Corporation (HDC), investment costs are US$160 million. Total costs in both phases include land raising and infrastructure, i.e. roads, water and sanitation system, schools, health, and parks. Adaptation costs are incurred solely for additional land raising, and are only a small portion – around 8 per cent – of the overall project costs. Both Hulhumalé Phase I and Phase II were raised an additional 0.6 m above protection levels at Malé to reduce risk from long-term sea-level rise (MEE, 2015) for an incremental adaptation costs of US$16.1 million.

The project generates revenues for the government through several channels. Land was leased for private real estate development for long-term use. While all of Phase I was allocated for either social or government housing, resulting in no net profits, Phase II has a social housing allocation goal of 30 per cent, leaving ca. 588,000 m^2 available for private development (Bisaro et al. 2018). Developing and successfully leasing this land is estimated to bring the government an US$830 million over the course of the project (Bisaro et al. 2018).

Tax revenues in Hulhumalé are generated through acquisition fees, which the government charges to developers for land in Hulhumalé. This fee ranges between US$50,000-$100,000 depending on plot size (HDC, 2017), and can bring a further US$15 million in revenue (Bisaro et al. 2018). Further, in addition to direct revenues, the project also generates indirect revenues from increased economic activity on the new island. For instance, a business profit tax of 15 per cent is levied on all persons or entities doing business in the Maldives. While such revenues are more uncertain, they have been estimated at US$111 million (Bisaro et al. 2018).

With respect to distributional aspects, as a key rationale for the project was improving access to affordable housing in Malé for all segments of the Maldivian population, the entire Phase I and 30 per cent of the residential development in Phase II was dedicated to social housing. Yet, while prices of social housing units are below market for the greater Malé area (NBS, 2014), they are still high compared to the per capita income. Thus, lower income households have less possibilities to access affordable housing, which also depends on not highly transparent application procedures for access to credit (MNBS, 2012). Moreover,

regulations against sub-letting social housing units have not been strictly enforced, further restricting the access for the poor by increasing the value of and competition for social housing units.

Regarding environmental impacts, while there have been some short-term negative impacts from dredging on surrounding reefs, over the medium to long-term environmental impacts of the project on the Maldives are positive, as it has reduced environmental pressures on other atolls by concentrating the population on Hulhumalé (Magnan et al. 2016). This process will continue as the new island is further developed and populated.

Benefits, Lessons Learned and Outcomes

Contributions to SDG

Reclamation activities are linked to the Sustainable Development Goals (SDG) and can add to their achievement. Climate change, natural disasters, and coastal development affect various aspects of human development, including poverty. In island coastal cities, highly depending on fishing and shipping activities, damage or destruction of port infrastructure by extreme weather events can strongly affect regional supply chains, which in its turn poses a threat for the population's food security and health.

By adapting to climate change and reducing the vulnerability to sea level rise and erosion (SDG 13), land reclamation aims to contribute to promote well-being and ensures a safer live (SDG 1, SDG 3). By including social housing into the project, inequality within the country can be reduced (SDG10).

Lessons learnt and key take-aways

Land reclamation is occurring in many places around the world, and the incremental costs of building adaptation into such projects are often small. Public actors can thus offset adaptation investments though land reclamation projects. By leveraging public funds in this way, greater investment in coastal adaptation can be enabled.

However, while the potential for public finance and coastal flood risk reduction is attractive, there is a need for careful consideration of the ecological and long-term impacts of land reclamation and these must be integrated into public decision-making (Magnan et al., 2016).

First, special attention must be paid to the environmental impact of these projects, and dredging sites and techniques must be carefully designed and implemented to minimise impacts on coastal ecosystems. Moreover, impacts of sediment flow, and thus coastal risks, on areas adjacent to the project should also be considered. Second, it should be emphasised that such projects can lead to development "lock-ins", potentially unsustainable over the long-term particularly given high sea-level rise uncertainties (Barnett and O'Neill, 2010). Finally, ensuring equitable outcomes and inclusiveness is key to ensuring their social sustainability. For instance, social housing should be a significant part of the project; but this is not enough on its own. The enabling environment for effective implementation of social housing policies is key to ensure equitable outcomes and reducing the vulnerability of the poorest segments of society.

Information

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