

# Migration, Environment and Climate Change: Policy Brief Series

ISSN 2410-4930

Issue 11 | Vol. 1 | December 2015

The *Migration, Environment and Climate Change: Policy Brief Series* is produced as part of the **Migration, Environment and Climate Change: Evidence for Policy (MECLEP)** project funded by the European Union, implemented by IOM through a consortium with six research partners.



Disastrous impact of landslides caused by episodes of heavy rainfall in the region of Quatre Soeurs of Mauritius. © L'express 2014.

## Using migration to develop resilience against climate change in Mauritius

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### Introductory note

Environmental change has historically influenced human settlements, and due to climate change, exposure to extreme weather events is increasing and impacting the Republic of Mauritius. Among the 171 countries that are most vulnerable to climate change, Mauritius is ranked 18th according to the World Risk Report (UNU, 2014). In addition, other reports on potential adverse impacts on communities, livelihoods and the economy at large, for instance, produced by the

Intergovernmental Panel on Climate Change (IPCC, 2007 and 2014), United Nations Environmental Programme (UNEP, 2014), the Government of Mauritius (2013a and 2013b) and United Nations Framework Convention on Climate Change (UNFCCC, 2014), already highlight the daunting challenges that Mauritius will face in the near future with projected climate scenarios. Observed changes in climatological variables, such as instability of rainfall patterns, increase in the intensity of tropical



This project is funded by the  
European Union



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cyclones and sea-level rise, among others, have already impacted people and communities in Mauritius and its outer islands, especially Rodrigues. Today, one of the key challenges of the government is how to integrate migration within its strategies to mitigate the effects of climate change on current and future generations, within a framework of long-term and inclusive development.

## Extreme weather events observed in Mauritius

Among the extreme weather occurrences in Mauritius, there are three that have directly impacted communities: tropical cyclones, flash floods and sea-level rise. Other related observed phenomena are droughts, landslides, forest fires, coral bleaching and wave surges.

### Tropical cyclones

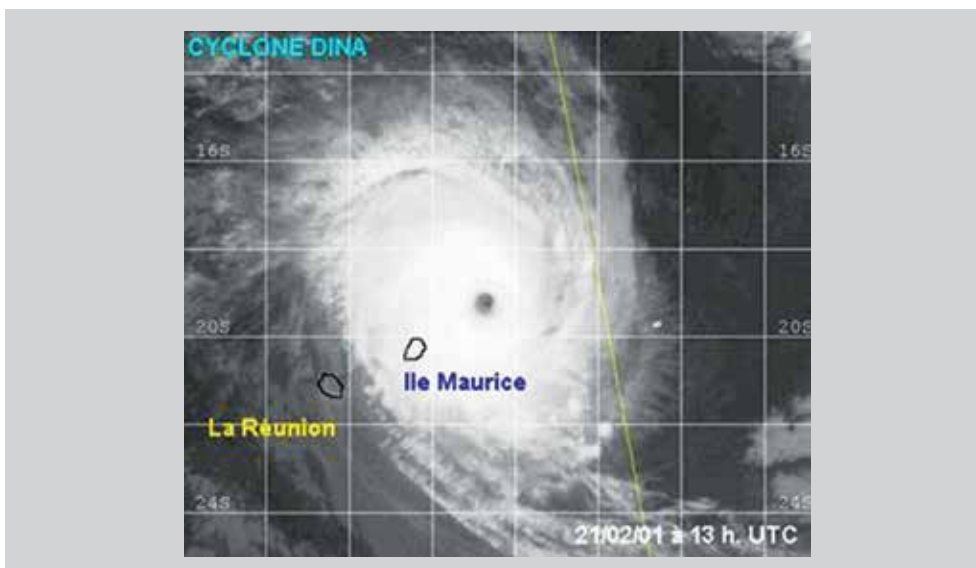
Mauritius is highly exposed to very intense tropical cyclones that can generate gusts of wind exceeding 260 km/h, accompanied by episodes of torrential rains often exceeding 400 mm of rain. Such tropical cyclones are responsible for loss of human lives, severe damages to public and private infrastructure, agriculture and farming, and beach erosion through wave surges, among others (Government of Mauritius, 2013d). Recent past records have indicated that there are more intense cyclones with much longer life in the South-west Indian Ocean area (Government of Mauritius, 2015b). Very intense tropical cyclones, with mean surface winds exceeding 212 km/h (Government of Mauritius, 2008) with a more extended diameter, have been identified over the past two decades, for instance, cyclones Bansi and Eunice in 2015.

### Changing rainfall patterns and flash floods

According to IPCC (2007) and the Mauritius Meteorological Services (MMS) (Government of Mauritius, 2015b), it is expected that the long-term annual mean of rainfall 2,010 mm (measured between 1971 to 2000) will decline, and Mauritius is already facing sparse distribution of rainfall from 4,000 mm on the Central Plateau to 900 mm in the western region. According to past technical reports of the MMS, episodes of droughts are becoming more frequent over the years, with remarkable deficiency in rainfall noted in the years from 1983 to 1984, from 1998 to 1999 and from 2011 to 2012. In particular, the average annual rainfall will drop by 8 per cent (IPCC, 2007). On the other hand, episodes of flash floods will become more frequent. On 30 March 2013, a flash flood occurred in the capital city of Port Louis, killing 11 people, when 152 mm of rain fell in a very short span of time (Government of Mauritius, 2013c). Heavy rainfalls are usually accompanied by landslides in places, such as Chittrakoot, La Butte, Quatre Soeurs and Montagne Ory (Government of Mauritius, 2013d).

### Sea-level rise

The IPCC (2007) forecasts that sea level will rise between 18 and 59 cm by 2100. Based on a long-term average of tidal gauge records from 1950 to 2001, it has been reported that the sea level has risen by 7.8 cm in Mauritius and 6.7 cm in Rodrigues Island (Government of Mauritius, 2015b). Such tendency would result in beach erosion, loss of bays and severe damages to built-up areas around the coast. Sea-level rise has accentuated the impacts of storm surges, thereby constituting threats to the beautiful coastal landscape in only a few years (Government of Mauritius, 2013; UNFCCC, 2014).



Satellite picture of very intense cyclone Dina approaching Mauritius (Ile Maurice) on 21 January 2002.  
© Reliefweb, 2002.



Rock revetment in the south-west of Mauritius. © Ministry of Environment of the Government of Mauritius, 2015.

## Identifying the most vulnerable communities to climate change

The vulnerability of certain specific communities to climate change impacts varies according to their degree of exposure to different weather and weather-related phenomena, in addition to their socioeconomic characteristics. Both elements are crucial for short- and long-term planning for human settlements under climate change threats. This table illustrates the overall status of development of a village measured in terms of the Regional Development Index (RDI) and its ranking with all other places in Mauritius.<sup>1</sup>

<sup>1</sup> Computed by Statistics Mauritius (2011), the RDI is an adapted variant of the Human Development Index as computed by the United Nations Development Programme to capture specificities of Mauritius regarding demographic and socioeconomic evolution of a locality. Hence, this measure tracks the relative development of small areas of the country while encompassing the following aggregates: (a) housing and living conditions; (b) literacy and education; and (c) employment. The RDI ranges between 0 (least developed) and 1 (most developed) for 144 regions of the island of Mauritius and including Rodrigues.

The relative development status of some villages is shown in the table below along with one suburban area (Ward IV-Port Louis) that could be easily exposed to extreme weather conditions. The coastal village of Le Morne has the lowest RDI in Mauritius as indicated in the table. Despite the high proportion of employed people, many of them are working as registered fishers, farmers and manual workers with relatively low income. Furthermore, their low income and dependence on nature for a living may easily be jeopardized by climate change. All in all, these people are highly exposed to tropical cyclones, storm surges, saltwater intrusion, beach erosion and water stress, given their location and the island's topography. Rodrigues, which forms part of the outer islands of Mauritius, is ranked after Le Morne in terms of its RDI. The island is highly exposed to extreme weather phenomena. One third of the houses are still not built of concrete, making them vulnerable to tropical cyclones and related calamities.

## Vulnerability of communities to climate change

Region/Village and RDI rank (in parentheses)	Population size	Potential threats due to climate change	% of houses in concrete	% of right of ownership	% of literacy level	% of employment level
Le Morne (South-west) (0.46)	1,300	Sea-level rise, wave surge, drought and landslides	43.3	97.0	81.3	87.0
Rodrigues (0.56)	40,434	Sea-level rise, wave surge, water stress	69.2	94.0	78.7	88.4
Case Noyale (South-west) (0.57)	1,703	Sea-level rise, wave surge, drought	68.9	90.0	74.0	93.0
Quatre Soeurs (South-east) (0.66)	3,317	Sea-level rise, saltwater intrusion, landslides	67.1	99.0	77.5	90.0
Chamarel (South-west) (0.65)	783	Floods, landslides and water stress	66.7	100.0	82.1	91.5
Post de Flacq (East) (0.66)	8,454	Sea-level rise, beach erosion and wave surge	62.0	95.0	83.0	91.0
Port Louis (Ward IV) – capital city (0.77)	18,443	Flooding, high temperature	73.3	75.0	94.0	92.0
Cap Malheureux (North) (0.75)	5,070	Storm surge, water stress, flooding	79.0	91.0	88.2	94.0

Source: Statistics Mauritius (2011) and author's assessment of climate change threats from landslides and flooding maps, as well as per local observations (Sobhee, forthcoming).



The flash flood of March 2013 that struck the capital city of Port Louis. © Desai Associates 2013.

## Climate change-induced relocation

Surveys conducted by IOM (2011b) and the Government of Mauritius (2013d) at Rivière des Gallets, which is in the south-west of the island and highly sensitive to sea-level rise and storm surges, have revealed that while young citizens have expressed willingness to be relocated elsewhere, the elderly opposed the idea largely because of their ancestral ties to the area. Another relocation plan pertains to the south-east of the island, in the village of Quatre Soeurs, where there are risks of landslides especially after heavy rainfalls. In this context, the government has agreed to relocate 11 households to Camp Ithier, whose houses were threatened of crackdown. All the households, in principle, have agreed to move to the new location given the degree of severity of this natural calamity.

IOM has also conducted studies to investigate the migration of people from Rodrigues to Mauritius (2011a and 2012). These have uncovered that such migration could be essentially explained by economic factors, but did not exclude environmental degradation linked to climate change. In fact, in the study undertaken by IOM (2011a) on migrant fishers moving from Rodrigues to Mauritius, 31.6 per cent of the respondents attributed their migration to a constant decline in fisheries resources, resulting in declining fish catch and threatened livelihoods. However, these migrant fishers have been settling in regions that are economically disadvantaged.

## Mainstreaming migration into development strategies: International and national policy dynamics

The Government of Mauritius has expressed its approach to policymaking and commitment to sustainable development as a top-down, bottom-up approach (Government of Mauritius, 2013a). Developing adaptation actions that may reduce the pressure on climate-prone communities to migrate have been a core issue for the country. Recognition of the positive adaptive outcomes of mobility, as well as alternative solutions for displaced people for whom return will not be possible have both been largely sidelined. This approach has been replicated in Mauritius' involvement in the Global Forum on Migration and Development, the UNFCCC and the Hyogo Framework for Action<sup>2</sup> and post-2015 implementation of the United Nations

Sustainable Development Goals (SDGs),<sup>3</sup> as well as in the implementation of local-level adaptation projects. Importantly, Mauritius has included “plans to protect life and property and mitigate any propensity of migration of its population” within its Intended Nationally Determined Contribution (INDC) for the 21st Conference of the Parties to the UNFCCC in Paris (COP21).

Concrete efforts to address livelihoods security and vulnerability, either stemming from or contributing to the causes of migration and displacement under the Barbados Programme from Action and subsequent Mauritius Strategy (MSI),<sup>4</sup> as well as from the Maurice Ile Durable (MID), has provided the opportunity to define a shared vision of sustainability for Mauritius, Rodrigues and Agalega (Government of Mauritius, 2013b).<sup>5</sup>

## International climate change debates: the stakes for Mauritius and other small island States

Within UNFCCC negotiations, Mauritius is a strong negotiating State among the Small Island Developing States (SIDS), Alliance of Small Island States (AOSIS) and the Group of 77 (G-77). As a State with significant environmental sensitivities and exposure to risks, not least the threats to Agalega's atolls, addressing mobility within the frame of evolving environmental and climate risks is paramount.

## Environmental justice and environmental migrants

Environmental justice has a powerful place in the climate change debate, particularly among SIDS, which places the onus on emitting States to take responsibility for the burden of potential – and undefined – climate-related migration and displacement. Adaptation concerns were downplayed for fear that these discussions would divert attention from the importance of mitigating climate change (UNU, 2013). This strategy has not borne fruit, reinforced by the abandonment in October of a proposal

<sup>3</sup> The SDGs are the successors of the Millennium Development Goals, which set concrete targets for 18 goals for sustainable development to be achieved by 2030.

<sup>4</sup> 125 SIDS and territories participated in a conference that led to the Barbados Programme of Action (BPOA) for the Sustainable Development of Small Island Developing States (1992), which was then strengthened in the Mauritius Strategy (MSI), adopted at a UN-mandated (A/57/262) high-level meeting in Port Louis. The MSI has built on the BPOA up to current post-2015 talks on the SDGs, seeking especially to strengthen opportunities for transfer of technology and support climate adaptation projects.

<sup>5</sup> The Ministry of Environment and Sustainable Development developed a proper framework for the translation of the National MID Vision into a concrete policy, a 10-year strategy, together with an action plan (Government of Mauritius, 2013b).

<sup>2</sup> The Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters (HFA).

in the COP21 negotiating text for a facility to address climate-related displacement and other forms of human mobility articulated by the least developed countries. While AOSIS and the G-77 had previously not officially considered the proposal, the latter is now spearheading a drive for its reinclusion in Paris negotiations. Many countries, including Mauritius, have much to gain if the international community includes mobility in planning financial needs for non-economic loss and damage from climate change.

## Adaptation overtakes mitigation in UNFCCC negotiations

Today, Mauritius considers adaptation as the key issue for local communities as they manage a changing climate. The 2013 National Climate Change Adaptation Policy Framework (NCCAPF) (Government of Mauritius, 2013d) seeks to translate goals on adaptation into pragmatic actions, which contains provisions to support adaptation, in situ, for populations who are unwilling to move and which seek innovations in technology and identifying pilot projects relevant to enhancing local communities' resilience-building efforts.

## Beyond 2015: Global and national action on migration and development

Environmental changes are not expected to lead to significant increase in outmigration from Mauritius, nor create large contingents of internal migrants (IOM, 2011b). However, changing access and availability of resources and its dividends on livelihoods is likely to increase pressure on local communities. In addition to branching into regional and international dialogues on migration management, continued domestication of international development strategies and implementation of the NCCAPF will help to prepare for the potential migratory outcomes of natural hazards and environmental changes.

### Migration and mobility:

- Through its involvement in the Global Forum on Migration and Development and in follow-ups to a thematic partnership between the African Union Commission and European Commission, Mauritius should continue to make steps towards delivering the full development potential of migration, such as facilitating access to credit, reducing barriers to remittance flows and improving the ability of Mauritian migrants and potential migrants to access education and employment abroad (European Union-Africa Partnership, 2013).

- Positive outcomes of migration on adaptive capacities of Mauritian communities should be better acknowledged and facilitated. In addition to the above, migrant diaspora can be encouraged to support pooling of resources and capacities at the community level to increase disaster risk reduction, sustainable land management and informal insurance.
- Concretizing meaningful actions to build resilience of local communities will require embedding mobility of populations for whom adaptation to environmental changes may not be possible – that is, candidates for resettlement, relocation and integration – into national adaptation and development strategies, within the larger framework of the post-2015 SDGs.

### Regional and international cooperation:

- Cooperation within international and regional partners is necessary for effective and comprehensive policies on migration and mobility, within a framework of national progress towards implementation of the SDGs.
- Funding is a main limitation to Mauritius' climate change action efforts stated in its contribution (INDC) to the UNFCCC (Government of Mauritius, 2015a), including the advancement of community-based projects to address the vulnerabilities of poor climate-prone communities while building long-term resilience. While multilateral funding is available for the MSI via the Global Environmental Facility Trust fund and the Special Climate Change Fund, in the face of declining official development assistance, Mauritius must continue to seek other sources of development financing.<sup>6</sup>

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*This publication has been produced with the financial assistance of the European Union. The views expressed in this publication can in no way be taken to reflect the views of the European Union or of IOM.*



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