

# Chapter 12

## Local Expert Perceptions of Creeping Environmental Changes and Responses in Maldives



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### 12.1 Introduction

Maldives is a country comprising atolls and thus has low-lying elevation. It has long been recognized as being particularly affected by potential impacts of human-caused climate change which is one example of creeping environmental changes affecting local-to-global scales (Glantz, 1994a, b). The combination of low elevation, comparatively small island size, and its environmental and social conditions and trends makes Maldives often claimed as being among one of the most vulnerable countries to impacts from creeping environmental changes, although other analyses describe some aspects of successfully dealing with vulnerabilities, especially regarding the environment and livelihoods (e.g. Knoll, 2021).

Maldives is an archipelago of around 1190 islands, grouped into 26 low-lying coral atolls. Around 200 islands are currently inhabited and over 80 more are used as tourist resorts. In recent years, tourism accommodation has been permitted on inhabited islands leading to guest house businesses (Chia & Muiz, 2021). The country's total land area is approximately 298 km<sup>2</sup> and no island is larger than 10 km<sup>2</sup>. Most islands are usually flat and on the order of 1 m above average sea level. The highest natural point is indicated as being on a golf course in Viligili in the Addu Atholhu at 5 m above mean sea level (CIA, 2021). Maldives has a tropical climate and some agriculture, but the Maldivian economy depends strongly on tourism and

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fishing, making it highly dependent on imports of goods and services (CIA, 2021; Ghina, 2003; Malatesta et al., 2021).

This study focuses on local expert perceptions of creeping environmental changes facing Maldivians and possible responses to them, discussion of which is often dominated by projected climate change impacts and suggested adaptation measures to climate change. Specific focus tends to be devoted to the role of migration, which is highlighted as playing a significant and essential role in adaptation to climate change, although plenty of scientific discussions provide alternative viewpoints and point out difficulties with the climate change migration discourses (Nicholson, 2014; Santos & Mourato, 2021). There is typically inadequate differentiation among migration, resettlement, relocation, and displacement, especially in terms of trying to differentiate climate change impacts from inadequate responses to climate change impacts. Nonetheless, due to the popularity of assumptions regarding climate change and migration intersections (deconstructed by Nicholson, 2014; Santos & Mourato, 2021 among others), migration features prominently in local expert views, including in this study.

In particular, migration has always been a human phenomenon with long-standing migration and mobilities research not always factored into climate change studies despite the work placing climate change into wider contexts of migration (Fiddian-Qasmiyeh, 2020; Fiddian-Qasmiyeh et al., 2016). Here, migration is critically examined in terms of local expert perceptions of whether migration can or should be framed as a form of responding to creeping environmental changes, including but not limited to climate change, for Maldives. The importance of local experts is that many other studies tend to ask either locals in an affected place or else external experts, although Sovacool (2012a, b) are examples of exceptions by asking Maldivian experts. All contributions from interviewees have validity and importance, irrespective of different types of expertise or assumed level of being 'expert'. The focus on general populations or external experts can leave a lacuna in determining the understandings and viewpoints of experts directly from and living in an affected location. This approach is, in effect, highlighting local elites rather than non-elites (keeping in mind the critical literature on elite capture when seeking a representative sample) or external elites (whose views can be disproportionately accounted for, especially in many climate change studies).

## 12.2 Methodology

The core of this study is empirical research dealing with local expert perceptions of creeping environmental changes, challenges emerging from impacts, and responses or actions to these problems, with discussion frequently dominated by climate change. Research was completed through semi-structured interviews with local experts. Fifteen local experts from environmental, development, governance, business, and political fields completed interviews in August 2013, representing a reasonable sample within the capital city and comparatively nearby islands of a small

country (e.g., for Maldives, Chia and Muiz (2021) had nine interviewees which was deemed sufficient for their analysis while Shakeela and Becken (2015) used twelve interviewees). The interviewees here covered a wide range of opinions, backgrounds, interests, and employers (Table 12.1). They were selected, on the basis of their expertise through online searching and their professional position, especially in decision-making roles. Others were selected based on respondents' recommendations (snowball sampling). Diversity and availability also played roles. The sampling strategy was identifying possible experts online, contacting them via email, conducting these interviews face-to-face on-site (hence, the availability criterion), and then using them to recommend others (the snowballing component).

Representativeness is hard to determine verifiably, but when experts start recommending each other, then either saturation is close or else the selection process is trapped within a specific clique or bubble. The key is that diversity was achieved across numerous parameters (Table 12.1) since the possible interviewee cohort cannot be large within a country with a small population.

**Table 12.1** List and characteristics of interviewees

Code	Expertise	Gender	Location	Sector	Job position
M01	environment, conservation	F	Vilingili Island	non-profit organization	project manager
M02	environment, conservation	M	Vilingili Island	non-profit organization	project manager
M03	environment, conservation	M	Malé	non-profit organization	project manager
M04	environment	M	Malé	non-profit organization	consultant
M05	education	F	Malé	Private	director
M06	climate change	M	Vilingili Island	Public/state	environmental analyst
M07	energy	F	Malé	public/state	project officer
M08	environmental management	M	Malé	private/academic	lecturer
M09	computer specialist	M	Hulhumalé Island	Private	entrepreneur
M10	politics	M	Vilingili Island	Public	member of parliament
M11	tourist sector, management	F	Vilingili Island	Private	public relations manager and marketing
M12	history, national heritage	M	Malé	Public	head of department
M13	history, national heritage	F	Malé	Public	institutional officer
M14	environmental management	F	Malé	Public	lecturer
M15	environmental management	F	Malé	Public	lecturer

A semi-structured interview guide was used, but not always adhered to rigidly in order to let the interviewee take their own direction and highlight their own topics of importance in their own way. This approach is key to achieving in-depth interviews, ensuring that the interviewer has enough material to seed ideas without directing or leading the interviewee. The main clusters of discussion areas within the guide were:

- 1 Perceptions of environmental change, covering creeping environmental changes including climate change.
- 2 Knowledge and evaluation of climate change mitigation and climate change adaptation strategies, as well as their evident overlaps.
- 3 Migration patterns (internal and external) alongside attitudes towards migration as a potential adaptation measure for creeping environmental changes of which sea-level rise from climate change is notable.

Interviews were conducted in English, as all experts were fluent in the language as well as their native Dhivehi.

## 12.3 Results

### 12.3.1 *Environmental Changes*

Respondents indicated awareness of a variety of creeping environmental changes (Table 12.2).

These issues are illustrated by quotations from respondents, such as M01 and M02 discussing water scarcity, food insecurity, overfishing, and lack of fish (tuna,

**Table 12.2** List of mentioned environmental changes

Environmental issues	Number of respondents
waste management	6
Air pollution	2
Water pollution and management	6
Water scarcity	4
Food insecurity	1
Overfishing and lack of fish	3
Lack of space / overpopulated island / overcrowded Malé	3
Sea level rise / inundation	8
Beach erosion	7
Shift of seasons	6
Coral reefs destruction	5
Natural resources exploitation	1
Traffic (cars, motorbikes)	4
Tsunami	6
Tree cutting	2

in particular) along with unequal development of various part of Maldives. The seriousness of Malé being overcrowded was highlighted along with the implications for resources:

*The most important issues is pollution of environment. Ground water is exhausted and contaminated, sewage is going to sea, nothing is done. Water is not treated, it goes directly to the sea, almost near the beach, it destroys coral reef and sea life.*

Similarly, M03 talked about water management and water security:

Water management is serious issue especially for other islands (besides Malé), which harvest the rain water. They do not have enough water to filter it and use it. Every island does not have desalination plant ... [Moreover] rain water is not safe, it is full of toxins.

Regarding fishing, M03 mentioned:

Fisheries are getting smaller, migration patterns are changing (due to acid rain, temperature higher)... and it can be also cause due to overfishing. Fisherman have to go much further to get the same amount of fish, fish are more expensive.

M12 illustrates climate change and related issues, such as perceptions of sea-level rise and beach erosion as major creeping environmental changes:

Sea level rise – it is slow process, but it something we need to be aware of this.

On the topic of seasonality, M06 and M09 in particular expressed experience of perceived trends in weather patterns, namely delayed arrival of the wet season, more drier periods, and more weather which they termed as being unpredictable. M11 explained about weather:

*Timing is very different, it looks like that it is not going to be rain, but it suddenly rains ... it is more surprising ... before we used to know about it, but now we cannot expect when rains come or not.*

Similarly, M03 commented:

We have to re-evaluate monsoon patterns, we indicate more days of drought.

The implied conflation of numerous topics—from the environment even when influenced by society and from society only, as well as from local to global—is representative of taking a wide viewpoint, recognising the interactions and influences among topics. Notably absent is mentioning that the oceans are acidifying and warming, although these points could be subsumed within coral reefs destruction, water scarcity, food insecurity, sea-level rise, and other topics.

## 12.4 Mitigation and Adaptation Strategies

Climate change dominated perceptions of responses and actions, focusing on mitigation and adaptation as separate issues without much recognition of their overlaps and connections (Table 12.3). While most respondents agreed on the need to depend less on fossil fuels and to use renewable energy more, most of them evaluated a Zero

**Table 12.3** List of mentioned mitigation and adaptation strategies

Mitigation strategies	Number of respondents	Adaptation strategies	Number of respondents
Car restrictions	3	Land reclamation / artificial islands building	3
Using renewable energy sources	8	Safer islands concept	4
Zero Carbon strategy	5	Water security	1
		Controlled population movement	1
		Sea walls (barriers)	6
		Tanks for water	1
		Adapted house construction	1

Carbon Strategy as mainly public relations from the former president, rather than being a realistic plan. They perceived gaps between promotion of strategies and practical implications of implementing them, despite some examples of good practice existing, which they discussed. Suggestions to reduce energy consumption were notably absent, considering that this action is the most important for tackling overconsumption especially with regards to fossil fuel use by the shipping and aviation sectors, on which Maldives depends.

For climate change mitigation, M03 mentioned:

*It is important to claim that if Maldives become carbon neutral, nothing will change, but it is good to become a good example that is worth to follow for other countries.*

Yet M02 explained:

Every island has own diesel plant. On Vilingili, 25% energy comes from solar power. Solar energy is increasing.

M06 added:

34% of GDP is spent for importing of fossil fuels from Middle East. This is a huge amount. ... We need to achieve more energy security.

M01 illustrates similarly:

Here was the government plan to achieve a zero carbon society: use of solar energy and other environmentally friendly sources. For example, on Vilingili, vehicles are restricted. On Malé, there are second-hand cars. On other islands, they increased tax for imported cars having a 400% tax higher than the value of car.

For climate change adaptation, M06 highlighted tools perceived to be necessary for protecting beaches in Maldives, as they are deemed to be of high importance as key for local populations and tourists:

Insurance, building restrictions, sand banks, sea walls, plant trees and shrubs...we should try many things. Mangroves are very few on islands and they are not located on the beach, but inside the islands.

It was not clear how much the notion of “beaches” was conflated with or a subset of “coasts”. Not all shorelines around Maldives are beaches, including much of the capital Malé which is enclosed by an wall. Beach or coastal protection is also different from beach or coastal management, since the latter accepts that the water-land interface is dynamic and ever-shifting. Although not stated explicitly, there seemed to be an assumption that islands would be static and should be maintained as such. Compared to the focused approaches to mitigation, diverse attitudes were seen regarding adaptation strategies. Environmental activists were especially suspicious of engineering-related adaptation measures such as land reclamation (see Duvat, 2020 for a summary of land reclamation and expansion in Maldives) and the concept of “safer islands”, in which the population would be settled on islands deemed to be more robust to environmental changes (Sovacool, 2012b). The environmental activists articulated worries about damage to and possible destruction of the environment (also noted by Duvat, 2020). They pointed out unequal development of selected parts of Maldives, especially around Malé which included adaptation measures (e.g. M01 and M02). On the other hand, government representatives explained that the country cannot afford to protect all Maldives, so they felt that their attitudes were more sober or realistic and they were also willing to consider engineering-related idea such as artificial islands (e.g. M10). Since the data were collected, reclamation has continued around Maldives and a bridge for driving has been built connecting Malé with the country’s main international airport, Velana International Airport. These changes impact perceptions and realities of human impacts on coasts and the marine environment, the desirability of staying in Maldives, and the ease of getting to the airport in order to leave—or arrive. Certainly, before the bridge, the plethora of boats crossing between the airport and the capital left little delay in transport between them. Yet a “fixed link” such as a bridge can make the journey appear or feel to be easier, irrespective of the actual situation (Baldacchino, 2007).

## 12.5 Climate Migration?

One of the most prominent perceptions of respondents was their awareness of climate change induced sea-level rise leading to suggestions of the potential submergence of Maldives, yet they would not link this narrative to an actual need for outmigration to other countries. They prefer adapting on existing islands, accepting that it would be feasible, with migration perceived as being a last resort, to be implemented only after all other possibilities are assumed to be exhausted and islands are presumed to become uninhabitable.

Placing potential climate (change) migration in context, most respondents mentioned that many people already migrate for several reasons, mainly education, better paid jobs, and generally better livelihood possibilities and overall living conditions (Table 12.4). They stress the voluntariness of migration for individuals or families moving, rather than subscribing to recountings of community relocation or forced displacement.

**Table 12.4** List of mentioned migration drivers

Migration drivers	Number of respondents
Coastal erosion	2
Sea-level rise	2
Better education	6
Jobs	6
Tsunami	1
Rural-urban migration	1
Health care	1

M03 illustrates:

People have to do strange things when they are in danger ... If we emigrate due to sea-level rise, we lose our nation, our history... But, at one stage in future, we may have to leave... People do not move out of Maldives because of the impact of climate change or sea-level rise, but due to social things – better education, job, facility.

M01 points out the complications of creeping environmental changes interacting with the population's safety:

I have heard about one island, where some local people have to leave due to beach erosion, but I do not think is climate change. Maldives islands are very fragile, that sand is moving.

M12 echoed many others by stressing Maldivian identity:

We believe sea-level rise is a risk. But I do not think we would be under water now ... but no matter where we live, we need to be prepared. Being Maldivian is our identity. We should know about these things, maybe something may happen that force me to leave, but it is important for everyone to know the roots of his country. No matter where we live, we are still Maldivians.

M15 expressed likewise:

Migration alone is not solution for us, we have to take into account all these social aspects, it create so many conflicts, our culture will be lost.

M06, as a public office representative, agreed, noting the willingness and expectation to stay in Maldives as long as possible:

Migration is not an option. We do not want to leave our islands. We want to stay here.

The member of parliament, M10, supplemented this tendency to stay:

We should still try to remain here, unless they find that damage is so serious and islands are getting uninhabitable.

This discussion is in line with explorations into Maldivian migration (Simonelli, 2016) in that migration reasons take on a variety of forms. The experts reflect this understanding, identifying the richness of reasons to move and not to move—especially that possible threats do not necessarily supersede love of home and identity. These sentiments did not inhibit speculation about possible migration related to creeping environmental changes, even where it ostensibly contradicted the baseline



of expecting to migrate for many reasons. M03 indicated awareness and acceptance that:

At one stage we have to leave.

Similarly, M10 expressed the opinion:

Any government of Maldives should have a greater concentration on the process of moving Maldives into another place, either it's Australia, India or whatever. The bilateral talks have to be completed.

M11 admitted with respect to the assumption of not needing to migrate that:

Maybe two or 3 or 5 years later, my opinion will change.

## 12.6 Discussion

The results demonstrate, overall, little difference between the viewpoints of local experts determined here and previous discussions by other Maldivians and by external experts. Three main points emerge from combining the three categories of results:

- 1 Creeping environmental changes are recognised across scales and causes.
- 2 Responses and actions tend to be focused on climate change, rather than on a wider range of identified creeping environmental changes.
- 3 Migration is not perceived to be driven primarily by creeping environmental changes.

The first pattern is that the local experts recognise creeping environmental changes across scales and causes and they are connected to creeping social changes. This point is seen in the wide variety of changes mentioned alongside the high proportion of respondents mentioning several of them. The quotations further indicate links among the issues, not conflating or confusing them, but accepting the diversity of issues which interact. This result is not surprising, instead being in line with long-term understandings within island studies (Baldacchino, 2018) including for Maldives (Ghina, 2003; Malatesta et al., 2021; Sovacool, 2012a, b).

Also of importance is the experts' focus on local influences. They accept climate change impacts within creeping environmental changes, highlighting sea-level rise and seasonal shifts in particular, thereby not accounting for other climate change impacts and creeping environmental changes such as ocean acidification (Doo et al., 2020) and salinity intrusion (Jaleel et al., 2020). They also note that many of the changes can and should be attributed to local activities with direct impacts on day-to-day life, such as fishing and pollution. This attitude is helpful to avoid blaming external forces, such as human-caused climate change, for all problems and thereby seeks a balance, recognising that some actions could be achieved locally. The viewpoint from Maldives is in line with analyses from other low-lying island countries such as Marshall Islands (Rudiak-Gould, 2013).

Many of these actions, however, are focused on climate change, as per the second overall point. This is not saying that climate change was considered exclusively with regards to responses and actions. It does note that much of the vocabulary from climate change entered into proposed ways forward, namely “mitigation” and “adaptation”. Additionally, suggested actions were separated into mitigation and adaptation categories which is how the IPCC (2021–2022) has typically approached the topics. This separation occurs despite long-standing science explaining the importance of connecting mitigation and adaptation, especially why they should not have been viewed as being different in the first place (Kane & Shogren, 2000).

For adaptation, the majority of suggested strategies focus on large-scale, top-down actions. Engineering-related measures were popular, with sea walls of especial interest which is a typical local and expert viewpoint irrespective of studies explaining how relying on structural flood risk management induces increasing flood risk over the long-term (Etkin, 1999; Tobin, 1995). Conversely, Maldives might have little choice given its low elevation. Knowing that sea-level rise is happening and that waves do inundate the islands (Amores et al., 2021), major infrastructure changes are required to either live with saltwater flooding, raise the islands, or build walls around the islands. The latter two were referred to by the experts, but none considered the (albeit difficult) possible of living with regular sea flooding.

If engineering-related, top-down strategies are not accepted or successful for responding to and acting on creeping environmental changes, then an option continually raised for Maldives is migration. Much outside rhetoric focuses on topics such as “climate migration” and “climate change refugees”, even though extensive scientific publications contest those terms while challenging the inevitability of forced migration due to climate change (Nicholson, 2014; Santos & Mourato, 2021). Similarly, viewpoints expressed by Maldivians have usually de-emphasised population movements related to creeping environmental changes including climate change, while discussing other reasons, including the 2004 tsunami, education, and livelihoods (Gussmann & Hinkel, 2020), as corroborated by the experts interviewed here.

Yet individual decisions regarding where to live now or in the future are rarely straightforward or clear-cut. The ambiguities evident in the respondents’ views here are corroborated by other work (Fiddian-Qasmiyeh, 2020; Fiddian-Qasmiyeh et al., 2016), including for Maldives (Gussmann & Hinkel, 2020). They recognise that people generally are not moving due to climate change impacts, presumed climate change impacts, or expected or perceived climate change impacts. Such scenarios might be possibilities for the future within the context of other creeping environmental changes, creeping social changes, and individual and collective interests. Fundamentally, as migration and mobilities science explains—exactly in line with the respondent views here—human population dynamics are influenced by multiple factors with human-caused climate change being one factor, but rarely dominating, at least for now (Fiddian-Qasmiyeh, 2020; Fiddian-Qasmiyeh et al., 2016).

One recent example is the restrictions on migration imposed by responses to the COVID-19 pandemic that started in 2020. Maldives, as with many other countries, implemented local lockdowns and border restrictions, temporarily curtailing

movement including migration (Pooransingh et al., 2022; Sarkar et al., 2020). These forms of sudden restrictions can have differing impacts. Some people who might have been considering migration recognise the advantages, or just the reality, of their situation and elect to stay. Others who might not previously have been concerned about considering migration feel trapped and look forward to the opportunity to leave. In a sense, the rapid response imposition might bring movement options to the forefront due to lack of movement options, since the issue is acute and immediately present, in contrast to the long-term and slow-movement effects of creeping environmental changes. These points are all possibilities—mere speculation without cultural context. A suitable extension of the research here would be to re-interview the experts and others, including non-experts, discussing topics of non-migration as well as migration within the different contexts of various slower and faster changes.

As with other Maldivians and external experts, the respondents here (representing local experts) express important suggestions and identify key issues, particularly with respect to creeping environmental changes impacting their lives alongside responses and actions which people implement and could implement. These discussions accept that not all decisions are related to the creeping environmental changes, nor should they be. At times, divergence appears between their suggestions and other well-known possibilities not considered by the respondents here. Examples are reducing energy demand and considering non-structural strategies for flood risk management. The aspects which are not considered tend to match those which others also typically downplay, indicating a good match between the results here and previous work, in terms of both what is mentioned and what is not mentioned.

## 12.7 Conclusion

This work has contributed to filling in a continuing research gap by considering local expert views typically representing elites, decision makers, and other main stakeholders, rather than people in communities or external experts. The focus was on possible impacts from and actions in response to creeping environmental changes affecting Maldives. The results and interpretation identify some dissonance in understandings of possible impacts and resultant actions, in terms of recognising what might happen to the country, yet not fully considering the action-related implications. This dissonance differs little from similar studies of other cohorts, including for Maldives, challenging the notion that experts necessarily understand more than non-experts.

In comparing the work here to other studies, this overarching conclusion holds even for local compared to non-local experts. Consequently, policies and actions for creeping environmental changes should not make elites of experts, instead examining and applying different knowledge forms to accept that expertise appears in many ways in many forms (e.g. Williams et al., 1998). This approach to managing the impacts for creeping environmental changes is further important for ensuring

that people affected by decisions are able to provide knowledge and viewpoints for the decision-making.

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