

Why the draft LDAR 2021 must be withdrawn:

A review of social, ecological and developmental issues

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A brief guide to the Annexures

The LDAR 2021 is highly problematic and threatens to erode the socio-environmental resilience of Lakshadweep and its future habitability. In this set of annexures, we contextualise socio-environmental concerns of the draft LDAR 2021 by illuminating the unique environmental, economic and cultural landscape of Lakshadweep.

Annexure 1 enlists specific **issues with the LDAR 2021** from an environmental, social and livelihoods perspective. We outline both, points of concern and points on which clarity is needed. The context for each of these concerns and issues is presented in detail in the next four annexures.

Atoll islands and surrounding coral reefs are mutually linked; the fate of one depends on the fate of the other. In Annexure 2 we highlight the **environmental fragility of the Lakshadweep atoll-system**. Drawing on local and global literature on coral reef ecology, we discuss why ‘atoll islands’ are inherently fragile and existentially threatened by climate change. Following this, we describe the factors that bolster environmental resilience and the habitability of atoll systems (specifically; land cover and land use, lagoon health, and a network of uninhabited atolls that insures biodiversity). We describe how the LDAR 2021, through land-transformation, can severely erode the ecological resilience and future habitability of Lakshadweep. Finally, we highlight how existing customary and governmental regulations provide environmental safeguards in Lakshadweep and therefore need to be adhered to.

In Annexure 3 we give a **historical overview of land tenure and natural resource governance** in Lakshadweep, to understand the limited manner in which the LDAR 2021 approaches land and its appropriation. We describe a unique regime of legal pluralism seen in Lakshadweep where different legal systems (including customary matrilineal systems, sharia law and government regulations) govern both, individual properties and the commons. We further highlight the idiosyncrasies of property relations in Lakshadweep, particularly the concept of ‘land’ which encompasses the sea and lagoon, and property valuations that are based on both land area and natural resources (number of coconut trees). Finally we describe the importance of land commons (beaches and uninhabited atolls) for supporting livelihoods which are threatened by the LDAR 2021.

In Annexure 4 we provide an overview of fisheries – the prevailing livelihood activity in Lakshadweep and demonstrate its connections to land (i.e., beach and lagoon commons). The pole and line tuna fishery practised in Lakshadweep is one of the most ecologically and economically sustainable fishing practices globally and is directly and indirectly threatened by the LDAR 2021. We also provide evidence of self governance and community capacities to engage in participatory decision-making in the fisheries sector in Lakshadweep.

The LDAR 2021 facilitates large-scale tourism in Lakshadweep, stated to be modelled on the Maldives. In Annexure 5 we **critique the model of tourism development in the Maldives** which the Lakshadweep Administration aims to adopt. By comparing Maldives and the Lakshadweep archipelagos in terms of their geography, ecology, socio-politics, administration and economy we make a case that the Maldivian development trajectory is not viable in Lakshadweep. We highlight the consequences of the Maldivian tourism model for natural resources, biodiversity, ecosystems, society and culture in Maldives. Lastly, we review alternate models of atoll development adopted by Small Island Development Nations (SIDS). The SAMOA development pathway (SIDS Accelerated Modalities of Action Pathway) is a development framework that is bounded within climate change, place-based environmental fragility, equity, justice and human wellbeing and could be an aspirational development paradigm for Lakshadweep.

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Annexure 1

Specific concerns with the LDAR 2021

We detail below some specific concerns regarding ecology, resource governance, employment and other aspects with the draft LDAR 2021:

1. *The LDAR 2021 ignores and violates existing laws and detailed development plans made specifically for the Lakshadweep islands with involvement of the Supreme Court, scientific institutions, the Ministry of Environment, Forests and Climate Change and other departments.*

The development justifications for introducing the draft LDAR 2021 are not clear when several existing legislations provide a more comprehensive and holistic development blueprint. It undermines the extensive work done by various government and non-government agencies, ministries and scientific research institutions to put these plans in place.

Specifically, a High-level Committee appointed by the Supreme Court of India and led by Justice Raveendran [*In Union Territory of Lakshadweep v. Seashells Beach Resort (2012) 6 SCC 136*] has provided clear guidelines for the development of the islands. The draft LDAR ignores the recommendations made by the Justice Raveendran report, and the Integrated Island Management Plans (IIMPs) made under the Island Protection Zone notification 2011 and updated and approved through a detailed process [*Notified vide Gazette Notification number F.No. 14/1/2015-S&T for implementing IIMP*]. It also goes against the principles and good practices for land acquisition that the central government set down under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, the Biodiversity Act 2006 and others.

Building upon the existing legal and bureaucratic framework through a process informed by local self-government bodies and scientific and academic experts would help evolve a more consultative holistic development plan for Lakshadweep.

2. *The LDAR 2021 is vague and generic, and makes irrelevant references. This generalisation means that the LDAR 2021 is completely unsuitable to the specific*

context of the ecology, livelihood, resource governance and other contexts of Lakshadweep. This clearly shows a non-application of mind in the drafting of the Regulation.

Ecology

The draft LDAR 2021 completely ignores the realities of Lakshadweep. For example, Cl.17 (1) (n) proposes to reserve land for the filling up or reclamation of low-lying, swampy or unhealthy areas. Equating low-lying swampy areas with unhealthy areas indicates an archaic and inaccurate understanding of the ecological features of such areas. **Moreover, there are no swamps or habitats that could be equated as swamps present in Lakshadweep. This irrelevant reference not only shows a non-application of mind, but the vagueness of this clause opens up the prospect of reclamation of lagoon areas, and open beach spaces.**

Despite Lakshadweep being a highly eco-sensitive and biodiverse space, the LDAR 2021 does not acknowledge how biodiversity will be impacted by the proposed developmental activities. The word ‘sustainable’ or other provisions to promote sustainability in any sense of the word do not appear in the draft. While the draft makes multiple references to preservation / conservation of areas of natural value / beauty (section 32, cl 17(1) (j), 17 (1)(k), 19 (1) (b) (i), 48(2) (i)), **it does not mention how these areas will be identified and how the plans for conservation/preservation of these areas will be developed. This stands in sharp contrast to the detailed process of infrastructure development mentioned in the document.** This approach violates India’s commitment to the Convention of Biological Diversity (CBD). Additionally, as per cl 19 (1) (b)(i), areas will be reserved for green belts and natural reserves in the comprehensive development plan. However, the Lakshadweep already has management plans in the form of the IIMPs, and for specific protected areas like in the islands of Pitti, and community conservation initiatives like the Agatti Marine Conservation Reserve (2008). The LDAR 2021 makes no reference to these documents.

Lakshadweep has also been severely affected by several cyclones in recent years (Cyclones’ Ockhi, Maha, Tauktae) and these are predicted to increase in the Arabian Sea (Murakami et al. 2017). The draft **LDAR 2021 provides no provision for building infrastructure suitable for areas prone to natural disasters.**

The draft LDAR 2021 and the Administration have made intentions for large-scale development plans clear, but do not mention how they will ensure water security for the indigenous populations and tourists, and balance the inevitable competition for a range of resources that are already scarce. While the draft LDAR 2021 mentions provisions of

water supply (48(2)(h) and 9(j)), **it doesn't mention how the increased water requirements the proposed developments will necessitate will be addressed.**

The draft LDAR 2021 does not mandate environmental impact assessments (example surveys on sediment and water flow properties) before making land-use changes. This could jeopardize the future habitability of the islands for local populations. This goes against the Integrated Island Management Plan (IIMP) which requires the Administration to conduct site specific field studies and numerical modelling to determine the long-term impact of activities like construction of foreshore facilities. In fact, given the fragility of the ecosystem, the Lakshadweep Administration must extend legislation such as the EIA notification 2005 to include the tourism industry in Lakshadweep islands.

Interconnected livelihoods

The draft LDAR 2021 fails to identify the strong interconnectedness between the natural resources and the survival of the island communities. The sustenance of the three main livelihood and economy generating sectors for the islands viz. fisheries, coir industry and tourism depends on the ecological integrity and aesthetics of these islands. **The pole and line tuna fishery practised on the Lakshadweep islands is one of the most ecologically and economically sustainable fishing practices globally.** It directly or indirectly contributes to the livelihoods of more than 60% of the local population. It takes pressure off the coral reef ecosystems of Lakshadweep on which island habitability relies. Another critical cash crop of the islands are its coconut plantations and the various coconut-based products provide direct economic benefits to many islanders. These livelihood activities have now become a culturally and socially important activity with which the identity of local communities are linked.

While the draft LDAR 2021 identifies sectors such as tourism, it fails to even mention well-established, existing livelihood sectors such as fisheries or the coir industry. **Other than making a passing reference to 'fish' in section 2, under the definition of agriculture, the word fisheries does not appear in the entire document while completely irrelevant topics such as rearing of horses and mules find mention.** Similar to the reference to swamps, the rearing of horses is irrelevant to Lakshadweep since the island group has no equine species. This indicates an appalling lack of awareness of Lakshadweep's ground realities.

The draft LDAR 2021 makes no mention or recognition of the need to put in place any environmental or livelihood safeguards in the entire document. This seriously undermines the ecological and livelihood security of these already fragile island systems and the communities living in them.

Lakshadweep has its unique systems of governance of land and resources, which include multiple usages of land, specific forms of tenancy, ownership based on coconut-trees, a matrilineal system that co-exists with Sharia law and central government regulations, and traditional practices related to the commons. **These are systems that differ in significant ways to mainland laws and practices. The LDAR, which claims to be meant for development planning, has no mention of the specificities of land and resource governance on the islands.** As per clause 17 (1)(o) - the outline development plan provision for “controlling and regulating the use and development of land within the development area including imposition of conditions and restrictions in regard to the open space to be maintained for buildings....the discontinuance of objectionable uses of land in any area in any specified periods etc.” With a high population density, it is common in Lakshadweep for related families to live in multiple storeys of the same building. **These arrangements facilitate close family ties and protect economically weaker family members.** It is also common for joint families to subdivide plots when they grow large or on demand from family members. **Without taking these practices into account, the draft LDAR 2021 can prove disastrous to existing residential arrangements.** It is also not clear whether the members of undivided families would be allocated nearby plots or rights of women sufficiently protected during relocation mentioned in clause 62 (1) (b). Similar concerns are also present regarding clauses 18 (1)(c) and 19(1)(c).

The draft **LDAR 2021 does not mention how the biodiversity and customary rights of the people over uninhabited will be conserved.** Of the 35 islands that form the Lakshadweep archipelago, only 10 are ‘inhabited’ in the sense that people live on them permanently. However, several of the ‘uninhabited’ islands are not only traditional fishing grounds, but are also used for agriculture, and are sites of cultural heritage and customary land ownership and lagoon tenure for local islanders. These are also sites of unique biodiversity that connect islands (seabird nesting sites, fish spawning sites, turtle nesting sites).

3. ***The draft LDAR 2021 does not have adequate representation of the Panchayats, or other forms of community representation. It also ignores the need for scientific input for the planning of the fragile ecosystem of the islands.***

Several reputed scientific organisations and individuals have been conducting valuable research in the Lakshadweep islands for many years, and have supported the Lakshadweep Administration with their research. While the Ministry of Environment, Forests and Climate Change has recognised the need for including reputed institutions

[via notification no. 19011/16/91-IA.III on IIMPs], **the LDAR 2021 does not provide space for representation by scientific institutions and individuals.**

The LDAR also has little representation of the communities there, and goes against the principle of decentralisation. All islands in Lakshadweep are under panchayats. Article 243G of the Constitution specifically provides for the Panchayats to prepare plans for economic development. So far, there is no precedent for creating a separate Authority for planning in any panchayat areas in India. Why Lakshadweep should be singled out to create a separate planning authority is not clear. **The Lakshadweep Panchayat Regulation Act of 1994 already contains provisions that empower panchayats to take steps to plan for the development of the areas under their jurisdiction.** The present draft legislation and the composition of the Planning and Development Authority (PDA) shows a tokenistic approach to local-self government and the needs of the local communities. Given that over 90% of the population belong to the Scheduled Tribes category, their current space for representation in the draft LDAR ensures that they will never be able to veto decisions of the proposed authorities even if the local community is not in favour of these.

As per section 13 of LDAR 2021, every PDA within 6 months of constitution, must prepare a land use map and land use registers indicating present uses of every piece of land. But this section makes no provisions for the participation of the local community in the process. Similarly section 16 (preparation of an outline development plan), and section 18 (preparation of an outline development plan), do not contain provisions for consultation in the preparation of the plan. Given the complexities of the property system in the islands, including multiple usage of land, shared property, commons and tree-based ownership, the lack of close participation of local communities in the process will lead to inaccuracies and deficiencies in these maps and plans. **While there are provisions for feedback, the limited avenue provided will create barriers for participation and disproportionately impact the more marginalised within the community.**

There is ample evidence from around the world that the involvement of local communities is key to the success of any venture on sustainable development. This recognition is bolstered by the UN Declaration on the Rights of Indigenous Peoples, which gives the community the right to conservation and protection of the environment, Article 8(j) of the Convention on Biodiversity which recognises traditional knowledge and is in turn recognized under the Biodiversity Act 2006, which makes the Biodiversity Management Committee responsible for sustainable use of biodiversity and for preservation of habitats. **Not giving communities adequate space makes the draft LDAR 2021 in its current form highly susceptible to development plans that are unchecked and environmentally unviable.**

Development of the island can only be achieved by ensuring local community participation in the process and planning for their developmental aspirations rather than imposing an ‘outside’ vision.

4. *The draft LDAR 2021 provides blanket permissions for tourism that ignore research on the negative impacts of tourism and established good practices and principles.*

The draft LDAR 2021 does not define the word eco-tourism or establish guidelines for ecotourism. This gives room for arbitrary definitions that are not properly vetted by ecological experts. Paradoxically, several environmental safeguards are removed from this section if a project falls under ‘eco-tourism’. Section 34 states that as long as the proposed *“Eco Tourism Activity can be set up to an extent of 5% of the total area and that the minimum area required is not less than 20,000 sq.m. these projects will be exempt from Eco Sensitive Zones declared under the Environment Protection Act, 1986 and the Rules framed there under by the Ministry of Environment and Forest.”* **This is a complete violation of many environmental laws, most important being the ICRZ 2019, the preamble of which identifies the need for conserving and protecting coastal and marine ecosystems and to protect rights of coastal fishing communities.**

This provision also goes against the Ministry of Environment, Forests and Climate Change’s Policy for Ecotourism in Forest and Wildlife Areas 2018, which specifically states that *“it is essential that management of ecotourism facilities primarily vests on the local communities as the principal stakeholders”*. The policy requires sustainable development and revenue sharing with the community. These aspects have not been taken into account in the draft LDAR 2021. Permissions given under this clause (section 34) could result in irreversible damage to the environment.

Most tourism feasibility studies identify the coastline, shallow lagoon areas and the beach, as sites conducive for development. These are also sites where many critical fisheries related activities such as boat building, monsoon storage, processing tuna and masmin production, sales of fresh tuna, boat maintenance activities and many other fisheries-allied activities are carried out. Lagoon villas and beach-based tourism, proposed under other recent plans for Lakshadweep, will additionally restrict access of fisherfolk to the lagoons where they hunt for baitfish and other reef fish. Further, the beaches are the only recreational sites available for the local communities. **Draft LDAR 2021 gives unlimited powers to the committee to restrict activities along the coastline, thereby depriving fishers of their claims over the coastal space, undermining one of the most critical livelihood and revenue generators of these islands. It will leave local communities with no more space for recreation.**

5. *The draft LDAR 2021 is closely linked to development plans, particularly of tourism. The Administrator has been quoted in the media stating the aim of developing Lakshadweep like the Maldives. While the Maldives model itself has been under criticism (See Annexure 5), the Regulation does not meet even the standards used by the Maldives.*

- The Maldives has 1192 islands of which 200 are inhabited (16%), whereas the Lakshadweep has 35 islands of which 10 are inhabited. This represents 87% of land area which is permanently occupied, and a further 8% of land area on ‘uninhabited’ islands are used as resource areas and for fisheries. It has a **one-island one-resort policy. Resorts are not allowed on inhabited islands.** As mentioned above, **the draft LDAR 2021 has no specific sections on how uninhabited and inhabited islands will be used for tourism or managed differently.**
- Tourist resorts in the Maldives require environmental clearances from the Environmental Protection Agency (EPA) before construction begins (Maldives Tourism Act, Section 15). Additionally, periodic compliance reports have to be sent to EPA once operation commences. **The draft LDAR 2021 does not mandate any environmental clearance procedure before construction begins or a regular audit of compliance.**
- In the Maldives, guesthouses on inhabited islands are allowed to function to promote ‘authentic’ tourism that is aligned with the cultural life of islanders. Many of these are owned by locals. The model is set up so the economic benefits of the said tourism could be shared with the local population. **The draft LDAR 2021 does not have any provisions to ensure the economic returns of tourism will benefit the local economy or community.** Moreover, tourist resorts are required to hire local employees up to 50% of their staff. **The draft LDAR 2021 does not mention or provide any direction for employing local people.**
- Once an uninhabited island is leased to a resort in the Maldives. The resort is responsible for water supply, proper waste and sewage disposal and electricity generation. There is no dependence on resources available for the local Maldivian population in inhabited islands. In Lakshadweep, tourist activities are being planned on some inhabited islands, **however, there are no provisions in the draft LDAR 2021 on how water supply, waste and sewage management or electricity will be made available to the tourists without impacting local inhabitants.**
- A land development or land use regulation has never been employed in the history of the Maldives as an instrument for tourism development. Therefore, **we believe there are more effective and efficient ways to enhance tourism that do not require the implementation of a land-use focused regulation such as the draft LDAR 2021.**

Annexure 2

Habitability and the environmental fragility of Lakshadweep

Atoll islands and coral reefs are mutually linked; the fate of one depends on the fate of the other. Lakshadweep is India's only atoll archipelago and is very different in fundamental vulnerability from other island systems (like the Andaman and Nicobar islands). In this section, we highlight the specific environmental fragility of the Lakshadweep atoll-system to climate-change and land developmental pressures.

Drawing on local and global literature on coral reef ecology, we start by describing what 'atoll islands' (atolls hereafter) are and their inherent environmental fragilities. Following this, we describe the factors that secure environmental stability & habitability in atolls (specifically; land cover and land use patterns, lagoon health, and networks of uninhabited atolls). Finally, we highlight how the existing local institutions, customary and governmental regulations already safeguard environmental resilience in the Lakshadweep Archipelago.

A. Atolls are fragile systems and Lakshadweep is no exception

- "Atoll islands" (i.e. 'Atolls') are recently-formed (<4000 years), low-lying (with a mean elevation generally <3 m) islands. They are composed mostly of biologically derived carbonate sand, gravel and boulders, generated on coral reefs. Atolls are often encircled by a central lagoon: or a shallow body of water separated from a larger body of water by shallow reefs (Duvat et al., 2021).
- Coral reefs provide a natural protective barrier around atolls, but are threatened by global drivers like climate-change. **A healthily growing reef supports five essential dimensions of island habitability** (Duvat et al 2021): **land security**: i.e. the availability of stable land, **water security**: ie. the supply of natural freshwater free from seawater intrusion, **food security**: i.e. the supply of nutritious food and protein, **infrastructural security**: i.e. access to safe settlements and infrastructure that sustain freedoms and opportunities, such as for healthcare and education and **economic security**: i.e, access to sustainable economic activities like agriculture and fisheries.

- Atolls are existentially threatened by climate change disturbances: sea level rise, ocean-atmosphere oscillations, ocean warming and acidification, and tropical cyclone surges, that are increasing in frequency and intensity in the last decade (Duvat et al. 2021).
- Recent studies predict that most atoll systems across the tropical Indo-Pacific, including Maldives and Pacific Island Nations like Tuvalu, Cook Islands, Kiribati etc. will be completely uninhabitable by 2060-2090 owing to a breakdown of healthy coral reef frameworks (e.g., Storlazzi et al., 2018).
- Lakshadweep is an archipelago of 35 islands, 12 atolls, three reefs, five submerged banks. Lakshadweep covers a total land area of under 32 km.sq and houses a population of nearly 70,000 local inhabitants (~2000 people/ km.sq) in 10 of its 12 atolls (mean elevation of <3meters). Local communities have existed in Lakshadweep for at least the last 1500 years and have strong traditional links to the islands and its ecology (Ellis 1924, National Population Census, GOI 2011).
- Recent studies from across Lakshadweep suggest that land cover is rapidly shrinking due to coastal erosion, with the loss of an entire island (Parali 1, in Bangaram atoll) recorded in 2017 (RM Hidayathulla, PhD thesis. 2017).
- The Lakshadweep archipelago has witnessed 4 major ENSO-related temperature anomalies in the past two decades (Coral Reef Watch, NOAA, years: 1998, 2010, 2016 & 2019), together with 3 catastrophic cyclone within the last four years (Ockhi, Maha and Tauktae) resulting in widespread coral bleaching and mortality across the archipelago. ‘Coral bleaching’ is a stress response of corals to increase in sea temperatures, which can lead to mortality. Corals provide food and shelter to several marine organisms and wide-spread loss of corals can have cascading ecosystem-wide consequences for reefs (Bellwood et al. 2006).
- The frequency as well as intensity of mass coral bleaching events and tropical cyclones is increasing globally (Hughes et al. 2018) and in the Arabian Sea (Murakami et al, 2017). Lakshadweep in the past showed high ecological resilience to climatic disturbances, with a rapid recovery of coral cover and fish recorded after the first recorded mass-bleaching disturbance in 1998 (Arthur et al. 2005). This unique resilience was attributed to 1) existing customary and governmental environmental regulations which allowed reef fishing pressure to remain low & 2) healthy lagoons which supported the natural replenishment of coral and fish populations on outer reefs (see next section for details).
- However, owing to high climatic variability over the last 7 years, an increase in commercial reef fishing pressures and pressures from increasing urbanization of atolls, Lakshadweeps reefs have declined dramatically in coral cover (~40% decline in coral cover since 1998, Yadav et al 2018). At current estimates, recovery to pre-bleaching levels is projected to take nearly 30 years in the absence of further disturbances, which is highly unlikely.

The habitability of Lakshadweep is already severely compromised by climate change and existing anthropogenic pressures. The priority should be to bolster the ecological resilience of coral reefs, rather than burden reefs with additional anthropogenic pressures.

B. The LDAR 2021 threatens the ecological resilience of Lakshadweep through changes in:

B.1. Land cover and land-use practices:

While the importance of healthy coral reefs for atoll habitability is being widely accepted, the fundamental linkage between land cover, land-use change and coral reef health is poorly recognized. Most development and management measures in terrestrial and marine landscapes are conceived in isolation and are thus often prone to failure. Land-use and land cover can affect coral reefs through three fundamental processes which can be significantly altered by agricultural and urban (infrastructural) land-use change (reviewed extensively in Carlson et al. 2019). A summary of these fundamental links is provided below:

1. **Freshwater exchange:** Land cover regulates the amount of freshwater that reaches coral reefs, either through surface flows or groundwater discharge. Freshwater discharge reduces the salinity and temperature of seawater and is critical to support coral reef resistance to, and post-disturbance recovery of corals from temperature-related disturbances (i.e. Coral bleaching).
2. **Providing sources and sinks for nutrients and sedimentation:** Nutrients, organic (faecal bacteria) and inorganic contaminants and fine sediments are discharged on coral reefs through surface flow and groundwater from land. These land-based contaminants are detrimental to the growth and reproduction of coral and fish, and can alter behaviour and functional responses. Alarming, contaminants can remain suspended in the reefs for several years having long-term impacts on reef health. An increased discharge of organic nutrients to coral reefs has been linked to dangerous algal blooms and proliferation of competitive macroalgae which reduce coral health and cover (Fabricius, 2005). Urban infrastructure (especially roads and other linear intrusions) can have a significant impact on the amount of sediment discharged by increased surface run-off. Sediment influx increases turbidity on reefs and is associated with coral mortality, disease, decline in growth and survival of coral and fish alike. Sedimentation impairs the ecosystem capacity to cope with other disturbances.

3. **Biological exchange between land and sea:** Several marine and terrestrial species transcend the marine-terrestrial boundary and are important for the flow of nutrients and energy between the two ecosystems. Critically endangered species of marine turtles (Green turtle, Olive-ridley, Leatherback turtles- Schedule 1, Part II, Wildlife (Protection) Act of 1972) use beaches for nesting. Studies show that nutrients from terrestrial fauna like nesting seabirds provide important nutrient subsidies to coral reefs, enhancing overall reef health, fish diversity and ecosystem function (Benkwitt et al. 2019). A diverse assemblage of sessile invertebrates like sponges, bryozoans and ascidians persist in intertidal areas (area where sea meets the land and is tidally exposed or inundated), which contribute to nutrient cycling, bio-erosion, trophic interactions and stabilizing substrata for mobile organisms like fish and crustaceans.

Agricultural intensification and urban build-up can impact all three aspects of land-sea links: freshwater regulation, transfer of nutrients and biological exchange between land and sea by creating physical barriers to movement (earth moving and construction), habitat loss and degradation (including deposition of marine debris), biofouling (sewage), impacts through artificial lights and sound, and the introduction of invasive species and pathogens (through ballast water near ports) and novel pathogenic bacteria (from urban sewage). Urban infrastructure (including tourism) and agricultural intensification is directly linked to a loss of biodiversity (coral and fish), coral reef habitat, proliferation of coral diseases and pathogens in fish, and altered ecological functions like bleaching and storm-related disturbance responses (reviewed in Carlson et al. 2019).

B.2 Lagoon health

In atoll systems, lagoons form a crucial link and buffer between land and the sea. Shallow lagoons typically comprise a variety of biological habitats: seagrass meadows and coral patch reefs which make them highly productive ecosystems. Seagrass meadows provide essential regulatory services to atolls: they influence the shape and stability of the atoll shoreline by fixing loose soil sediment, diminish wave energy and trap sediments from the open ocean and regulate the cycling of nutrients between land and sea (Ruiz-Frau et al 2017). Seagrass can enhance the biodiversity of a lagoon by providing a physical refuge for fish and serve as nursery and feeding sites for a variety of juvenile reef organisms that begin their life in lagoons and then transcend to outer reefs. Seagrasses play a significant role in the sequestration and burial of carbon. Therefore, conserving seagrass ecosystems is being considered as an important international strategy to mitigate global climate change (Hejnowicz et al. 2015). In recent years, the extent of seagrass meadows in the Lakshadweep is shrinking rapidly, owing to a range of anthropogenic, and environmental pressures (Gangal et al 2021, Kaladharan & Koya 2019).

Apart from seagrass ecosystems, the patch reefs in lagoons also play a critical role in coral reef recovery. The coral patches that grow inside lagoons are the ONLY areas able to resist increases in sea surface temperature because of climate change. Nearly 30% of coral are currently at risk of extinction from climate change and local impacts (see Carpenter et al 2008). A number of recent studies are showing that sheltered locations like lagoons are sites of considerable acclimation, and are essential refugia for coral like *Acropora* - which are declining on outer reefs (Palumbi et al 2014, Camp et al 2019). These coral refugia guarantee reef recovery after every disturbance by serving as source recruitment sites of potentially resistant coral. The entire lagoon is therefore an insurance site for ecological resilience and atoll habitability. In addition, many marine species that are completely protected by the Wildlife (Protection) Act of 1972 are wholly or partially dependent on the lagoon including green turtles (Schedule I, Part II), ALL coral species (Schedule I, Part IVA), giant clams (Schedule I, Part IVB), and sea cucumbers (Schedule I, Part IV C).

Given the enclosed nature of the lagoons, all construction and other development activities is likely to constitute a significant and sustained long-term impact on lagoon ecosystems, with knock-on effects on coral reefs and atoll stability. Recently, 120 scientists from a range of scientific institutes in India signed a petition against Niti Aayog's proposal to develop 'lagoon villas' in Lakshadweep on social and ecological grounds (26th January 2020). Similarly, studies from Maldives suggest that tourism has a detrimental impact on the health of lagoon ecosystems (Cowburn et al. 2018). It is worth noting that lagoon reefs in several atolls in Lakshadweep are already showing very high vulnerability to degradation from climate change and local anthropogenic pressures (Ranith et al. 2017).

B.3. Biodiversity in uninhabited atolls

Biodiversity - or the variety of life on earth - is critical to maintain ecosystem processes and is strongly linked to human-well being. A landmark global assessment by IPBES (Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services, Díaz et al. 2019) showed that biodiversity is declining globally at an alarming rate (with over 1 million species extinctions expected by 2050) with major consequences for economies, livelihoods, food security, health and quality of life worldwide. Land-use change and climate-change are identified as the two most dramatic drivers of biodiversity loss globally.

Uninhabited atolls in Lakshadweep play an important role in the maintenance of biodiversity. Lakshadweep lies at the northern edge of the Lakshadweep-Chagos ridge

(which includes Maldives) and is influenced by strong physical regimes imposed by the South-West Monsoon season (Avraham and Bunce, 1977). Despite its close proximity to Maldives, coral reefs in the Lakshadweep are nearly half as biodiverse as those in the Maldives, owing to its geomorphology. Free from persistent anthropogenic pressures, uninhabited atolls can harbour upto six times the biomass of fish and a significantly higher richness of species and functions (D’agata et al 2016). In particular, large mobile fish species (predators and herbivores) that are critical for the healthy functioning of reefs, disproportionately benefit from disturbance-free refugia of uninhabited atolls. In the Lakshadweep, uninhabited atolls, like *Suheli*, *Cheriyapani*, *Perumal Par.* are located very close to habited islands (within 100 km), and likely transport biodiversity benefits to distant atolls through the dispersal of larval coral and fish (Williamson et al. 2016, Prasad 2020). Uninhabited atolls in Lakshadweep provide refugia to rare and unique fauna, like the globally endangered Bumphead parrotfish (*Bolbometapon muricatum*), Maori Wrasse (*Cheilinus undulatus*) and migratory species like oceanic sharks, 12 species of whales and dolphins (Panicker et al. 2020, Panicker and Stafford 2021, Birt et al. 2021) and marine turtles (Bhaskar 1978). These uninhabited sites also support high density spawning aggregations of commercially and functionally important reef fishes like groupers, snappers and parrotfish (Karkarey et al 2017). The losses of these fish spawning aggregations can have a significant impact on the stability of fish populations in surrounding atolls, to which they potentially transport larvae (Almany et al. 2009).

Uninhabited atolls in Lakshadweep play an important role in supporting local livelihoods (discussed in detail in Annexure 3). These atolls are used both for coconut cultivation as well as supporting traditional pole-and-line tuna fisheries. (Annexure 4). This customary use of uninhabited islands by local islanders has been critical in safeguarding not just local livelihoods but also coral reef biodiversity, by keeping permanent land transformation (and consequent environmental degradation) at bay.

Uninhabited atolls and sunken banks should be reserved exclusively for low-impact, non-commercial and sustainable use by local communities. Land development activities on uninhabited islands threaten to erode regional biodiversity which will be catastrophic for ecosystem processes and the well-being of indigenous communities in the long-run.

C. Existing regulations have contributed to supporting environmental resilience in the Lakshadweep Archipelago.

India is a signatory to many international agreements concerning the management of biodiversity and the environment. The proposed land development regulations will endanger India's commitments under these agreements by increasing anthropogenic pressures on vulnerable atolls, which will have irreversible environmental damage on local social-ecological systems. Specifically, it will impact our commitments towards the **Convention on Biological Diversity** (that aims for the conservation of biodiversity, through sustainable use of biological resources and the equitable sharing of benefits from use of biological resources), **Convention on Migratory Species of Wild Animals** (that aims to conserve migratory wild animals like marine turtles, cetaceans and migratory birds, throughout their ranges). **United Nations Framework Convention on Climate Change** (which seeks to combat global greenhouse gas emissions by adopting climate-mitigation strategies like conserving seagrass and mangrove ecosystems), **United Nations Sustainable Development Goals** (SDGs; that aim to secure peace and prosperity for our planet and people, while tackling climate-change and preserving the ocean and forests). Specific SDGs that LDAR 2021 will affect are GOAL 3: Good Health and Well-being; GOAL 6: Clean Water and Sanitation; GOAL 11: Sustainable Cities and Communities; GOAL 13: Climate Action; GOAL 14: Life Below Water; GOAL 15: Life on Land.

In an era when atoll systems are at the mercy of global climate-change, bolstering natural ecological resilience by strengthening local environmental conservation and resource management measures is a necessity. Several national legislations regulate the spatial planning of activities within environmental limits. The ones relevant to Lakshadweep are: the **Island Coastal Regulation Zone Notification 2011 and 2019** regulate human and industrial activity close to the coastline, in order to protect fragile ecosystems near the sea. ICRZ 2011 in Lakshadweep prohibits infrastructural development within 50m from sea line, except for beach shacks and huts that support activities related to local traditional fisheries livelihoods. The **Integrated Island Management Plans** (developed for each island, F.No 14/1/2015-S&T dated 22-06-2016) aims to ensure the future socio-ecological sustainability of Indian islands (Lakshadweep and the Andaman and Nicobar islands), by considering limits to development placed by local regimes of natural disasters (cyclones, tsunamis, floods, mass-bleaching events), freshwater water capacity and by including indigenous governance structures and knowledge in planning. The **Lakshadweep Action Plan on Climate Change (LAPCC, 2012)** has been formulated in accordance with the principles and guidelines of the National Action Plan on Climate Change (NAPCC). It provides a locally relevant framework - 'precautionary adaptive approach', to plan developmental activities within

the context of climate change. The **Wildlife Protection Act (WLPA 1972)** enables protection of animals and plants by delineating protected locations (national parks, sanctuaries, community reserves, conservation reserves, and zoos) and curbs illegal wildlife hunting and trade.

According to a recent report by IPBES-IPCC on biodiversity and climate change (Pörtner et al. 2021), 30-50% of land and sea needs to be protected to be an effective buffer for biodiversity from climate-change. **All such protection needs to be co-led with local communities who have the most to lose from biodiversity loss and climate impacts.** In Lakshadweep, several marine protected areas have been notified under the WPA to protect endangered wildlife: the **Dr Salim Ali Bird Sanctuary (2019)** protects a nesting seabird colony around Pitti island. In 2020, the Department of Environment and Forest, UT Lakshadweep declared three new marine conservation zones (covering a total area of 685 sq.km) for the conservation of sea cucumbers - **Dr. KK Mohammed Koya Sea Cucumber Conservation Reserve (2020)** around Cheriyanani (239 sq.km) and **Attakoya Thangal Marine Conservation Reserve (2020)** between Amini and Pitti atolls (334 sq km).

However, recognizing the dependence of local communities on biodiversity and their role in managing it effectively, the Lakshadweep administration has championed many community conservation initiatives: like The **Agatti Marine Conservation Reserve (2008)**, which was set up by the MOEFCC for the conservation of Giant Clams as requested by the Agatti Panchayat. Recently, the **PM Sayeed Marine Birds Conservation Reserve (2020)** was declared. This is the first protected area declared for pelagic seabirds (the greater crested tern, lesser crested tern, sooty tern, and the brown noddy). Other community-based regulations include the **Temporal fishing closure** in Bitra to protect a large spawning aggregation of groupers from fishing. This was declared in 2014 by the Fisheries Department, UT Lakshadweep along with the Bitra Panchayat. In densely populated, resource dependent locations like Lakshadweep, conservation measures need to be designed collaboratively with local communities and not impede low-impact sustainable use, whose activity does not jeopardise ecological integrity.

Existing forms of natural resource management (customary and governmental) play a significant role in enhancing the ecological resilience of the Lakshadweep, by keeping land development pressures and fishing low. Some of these are highlighted here:

Customary land tenure and resource governance (Annexure 3): The customary ownership of land in uninhabited atolls has historically kept development pressures on uninhabited atolls low, whilst enabling sustainable livelihoods (via coconut farming and coir production on land.). Similarly, a unique system of fisheries governance exists in Minicoy with several spatial, temporal and species-specific management practices based

on fishers' traditional ecological knowledge in place, overseen and implemented by a customary institution. (Dakshin Foundation, 2020). Both these customary systems play an important role in maintaining reef fish biodiversity and supporting the two main livelihoods of locals: ie. agriculture and fisheries. **Traditional Pole-and-line tuna fisheries (Annexure 4):** Pole-and-line tuna fisheries that were traditional to the Maldives were introduced to the rest of Lakshadweep in 1960. These fisheries have played an important role in keeping reef fishing pressure low and maintaining fish biodiversity necessary to support post-disturbance recovery (Arthur et al 2005). The **Justice Raveendran Committee Report (2018)** sanctioned by the Supreme Court outlines the inherent limits on developmental activities in Lakshadweep and prohibits commercial fishing on the reef (while allowing for small-scale subsistence fishing). Importantly, it recommends that any development by government or otherwise shall uniformly adhere to the **Integrated Island Management Plan (F.No 14/1/2015-S&T dated 22-06-2016) and in consultation with local communities.**

For safeguarding the ecological resilience and habitability of the Lakshadweep, it would be wise to build on this body of community-based legislation/measures rather than strike it down with a purely private land-ownership and urban infrastructure - focused regulatory model with little public and scientific consultation, as the LDAR 2021 seeks to do.

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Annexure 3

Commons and land tenure in Lakshadweep

Property relations in Lakshadweep must be approached differently from what is encountered in many parts of the mainland. Firstly, ‘land’ is never really in isolation from the lagoon and the sea. It is also not to be understood as separate from the use values associated with it (food, shelter, well-being etc). To understand the limited manner in which the draft LDAR approaches land and its appropriation through elaborate processes of its acquisition, we need to understand the relation between people and land, in its fullest sense, as comprised of land, lagoon and sea, and shall be referred to as such in this section.

These customary land (lagoon and sea) use and governance arrangements vary between the different islands. The land and resource governance has been shaped through different legal sources, including customary matrilineal systems, sharia law and government regulations. These arrangements are also based on other factors, such as shifts in resource availability and connections between the islands and the mainland. At present the resource governance regime seen on the islands is that of *legal pluralism*, whereby there is a simultaneous operation of all of these different systems governing both individual properties and the commons. As such, any instrument or authority governing the use, transfer and control of ‘land’ in Lakshadweep must closely incorporate these pluralities. These pluralities are briefly explained below.

The land in Lakshadweep is broadly categorised into *jenmam* (private property) and *pandaram* (claimed as government land).

Pandaram lands

Pandaram lands were originally lands that were unoccupied, but were later brought under the control of the Cannanore Rajas as their sovereign property. The pandaram lands were then managed by administrators of the Rajas, and islanders were allowed to cultivate the land for a rent paid to the crown. These were collective rights bestowed in favour of inhabitants through their village heads, with them acting as trustees.¹ Communities in Lakshadweep have always been highly aware of their dependency on their natural environment, and had created rules

¹ Supreme Court judgement on Deputy Collector, Minister And Ors. Vs Navadigothi Mohammed And Ors, 1996

around this. Part of the management of pandaram land included the village head deciding the time at which the people could go for resource collection known as *Sabilla*.

The practices of pandaram land management continued even after independence when the pandaram lands were transferred from the British to the Indian government. As government officials from the mainland were brought to the islands for their governance, customary systems began to be disregarded. Government staff quarters were built on pandaram lands, and in a bid towards land security, demand for individual ownership of pandaram lands was encouraged.

In 1965, as part of the government's efforts towards land reform, the Laccadive, Minicoy and Amindivi Islands Land Revenue and Tenancy Regulation, 1965 was introduced. Under this, tenants who were living in and cultivating pandaram lands were allotted lands under Section 83 and Section 14 of the Regulation. Since residents of Lakshadweep have been accorded 'Scheduled Tribe' status, transferability was restricted to protect the interests of the occupants from non-tribal people. The intention of protection of the tenants was recognised and accepted by the Planning Commission in the Lakshadweep Development Report 2007. According to the Report, *"the measure acted as an instrument of empowerment and played a significant role instrumental in enhancing the social status of the lower castes."*

Technically, only the right of occupancy was granted under Section 83 of the Regulation, and not ownership. However, the government allotted lands and gave pattas to allottees. That, along with land reform aims, were understood as giving the pandaram lands back to the islanders. Over time, some of these pattas were transferred to others. In a 2019 meeting, the National Commission for Scheduled Tribes,² approved the regularisation of these transfers taking into account geography, land scarcity, population density and other factors.

Several complications in use and possession of pandaram lands remain. Given the complex history and continuing complications over pandaram lands, the outright powers given to the planning authority under the LDAR 2021 to declare any areas as 'development areas', 'areas of obsolete development', and to acquire and modify land use will lead to re-marginalisation of communities in Lakshadweep. What is clear is that pandaram lands are not merely governmental land, but a space of legal pluralism and shared claims.

Inheritance and ownership of individual and matrilineal properties (Jenmam lands)

Inheritance and ownership of properties in the Lakshadweep further differ customarily. For example, *Velliazcha swoth* (Friday property) is land held by an undivided family, represented by the eldest member. This property cannot be partitioned, given away or sold without the consent of all the adult members. These properties are inherited through a matrilineal system, with

² 118th Meeting of National Commission for Scheduled Tribes (NCST) held on 27.08.2019

women enjoying the same usufruct rights as men, and decisions taken collectively in the family. Separately, there is self-acquired property, known as *Thingalazcha/Belasha swoth* (Monday/Thursday property) for which inheritance is Sharia. Inheritance and ownership may also differ from island to island.³

Property valuation beyond land area

Additionally, property claims in Lakshadweep were also linked to specific resources such as coconut trees, such that it was measured by the number of fruit bearing coconut trees and not by area of land. This meant that multiple persons could plant coconut trees on the same land with their legal heirs inheriting the trees. Both tenants and landowners could plant trees on the same land, leading to a mixing of tree ownership in the same piece of land. Originally, separate deeds were written for trees in addition to the land.

Property valuation has now mostly shifted to land type, but remnants of tree based properties still exist. When property division takes place in the families, coconut trees are also divided and it is still possible to have rights over coconut trees on a plot of land without owning the land.

Lakshadweep's coastal commons and local livelihoods

‘Commons’ is a term to refer to spaces and systems of shared resources that are used and managed by a community rather than by individuals. Commons are regulated by communities in different ways through the existence of formal and informal rules and practices, institutions etc.⁴ In India, coastal commons includes waters used for fishing, beaches used for storing boats, drying nets, cleaning catch etc., areas used for subsistence fishing, collecting crabs and clams, horticulture, areas used for social gathering and more.

In Lakshadweep, given the small size of the islands and the comparative stability of the westward side and lagoon, the beach commons on the lagoon side (west side of each island) are key commons for the islanders. Across the length of each island, fishworkers anchor their boats on the westward side due to the shallow depth and stability of the lagoon. The beach areas adjacent to their boats are then used as important areas for cleaning of fish as well as for sale of fresh fish. Beach commons are also used by fishworkers for the drying and smoking of fish to make *masmin*, one of the key sources of income for the people. Since fishing in Lakshadweep is a group activity, temporary sheds constructed on the beach by fishworkers are also the key areas for crew to assemble and conduct meetings. Beach commons are also used as important spaces

³ Vijayakumar, V., & Leelakrishnan, P. (1999). *Customary Laws of Lakshadweep Islands* (Doctoral dissertation, Cochin University of Science and Technology).

⁴ Ostrom, E. (December 8, 2009). *Beyond Markets and States: Polycentric governance of complex economic systems*. Nobel Prize Lecture.

for social gathering. In Minicoy, the 11 villages customarily manage their common spaces including the beach area which is used for fish landing and keeping the boats.

The community's rights over the commons was already violated on 28, April 2021 when the Administration demolished temporary sheds constructed on the commons. The demolition was condemned by the Lakshadweep Coastal Zone Management Authority (LCZMA)⁵, pointing out that the Island Protection Zone notification 2011 specifically protects existing dwelling units and infrastructure of communities and that traditional fishing and agriculture rights are permitted even in the No-development Zone. Further restrictions on the communities' uses also seem imminent. In a directive from the Additional District Magistrate⁶, the authorities have been directed to allocate designated places for fishers. While this appears beneficial, it can lead to additional problems since it concentrates fishers, their means and materials sources of livelihood and restricts their access to the beach commons in an already limited island space. For eg. Agatti, which has a maximum length of only about 8 km, has 17-18 big boats along with other smaller boats and for fishing to be viable and safe, the entire stretch is needed for the operation of these boats.

In this context, the promulgation of the draft LDAR 2021 has caused widespread apprehension among the fishers of alienation of their coastal commons. If customary institutions and community practices are delegitimised, it will be detrimental to these unique socio-ecological systems.

The importance of uninhabited islands for local livelihoods

While only 10 of the islands are 'inhabited', the 'uninhabited' islands are significant for the livelihoods of Lakshadweep's fishers. These islands are used both for coconut cultivation as well as fishing. For eg. islands like Bangaram and Suheli, recorded as uninhabited, and earmarked for development under the tourism development, are used by the people of Kavaratti and Agatti for agriculture, pole and line tuna fishing, and extraction of neera (palm nectar). Thus, these lands constitute a temporary/ seasonal livelihood to many islanders. Such spaces also must be treated as 'common' lands and their uses by the communities respected. The term 'uninhabited' itself merits revision.

⁵ Letter by the Lakshadweep Coastal Zone Management Authority to the District Collector, Kavaratti dated 09.02.2021.(File No.LD-04007/1/2019-S)

⁶ Directive dated 02-02-2021 from Additional District Magistrate Kavaratti to all deputy collectors (F.No.34/76/2020-LD)

Annexure 4:

Fisheries in the Lakshadweep - Significance and Challenges

The Lakshadweep Islands, India's only coral atolls, barely spread over 32 sq kms and are home to about 70,000 people. Being a geographically remote island system, the island inhabitants primarily rely on the locally available natural resources for their survival and livelihood. Coconut cultivation and fisheries are currently the largest contributors to local livelihoods (Hoon 2003). The main fishery practised here - the 'live-bait pole and line tuna fishery' is a unique, best-practice fishery that targets the resilient skipjack tuna in a low-impact, selective manner that diverts fishing pressure off the sensitive coral reefs that constitute these atolls (Jaini and Hisham 2013). Additionally, being a labour-intensive technique, it is one of the major sources of livelihoods for the local community in Lakshadweep. It may thus be one of the last remaining examples of a sustainable commercial fishery in India. In the Lakshadweep, fishing is not just a source of livelihood but an activity that is deeply embedded in the social fabric of the islands and a crucial element of the cultural identity of the islanders. Even the islanders who are not dependent on fishing for sustenance engage in various fishing activities from time to time as a source of recreation and social bonding.

A. Overview of Lakshadweep's fisheries

- For centuries, the pole and line tuna fishery has been practised in the Maldives and in Minicoy, the southernmost island of the Lakshadweep archipelago, which is geographically closest and socio-culturally similar to the Maldives (Jaini et al. 2017, Hoon 2003). The practice was successfully introduced from Minicoy to the rest of the Lakshadweep Islands in the 1960s by the Lakshadweep Fisheries Department (Dept. of Fisheries 1990).
- Lakshadweep's fisheries sector evolved from a subsistence-based fishery to a commercial fishery in the 1980s following motorisation of its fleet around this time. From 1760 tonnes in 1980, Lakshadweep's annual fish harvest has increased to 15612 tonnes in 2017, which is reflected in an increasing number of fishing craft, from 194 to 752 (Vinay 2017). Lakshadweep's fisheries production varied between 15,000 to 20,000 tonnes in the past five years with tuna forming more than 90% of fish landed. Until 2017, pole and line

tuna fisheries have contributed to more than 92.8% of the total tuna landings in Lakshadweep (Vinay 2017).

- Fisheries provide direct or indirect livelihoods to more than 60% of the local population making it the largest source of employment and revenue for the islanders (Zacharia 2007).
- The pole and line fishery relies on live baitfish to attract and catch tuna in the open ocean. Baitfish refers to small pelagic or reef-associated fish species found in the lagoons and reefs of Lakshadweep and is one of the major limiting factors for pole and line fishing operations. Sprats, silversides, fusiliers, cardinalfishes and damselfishes are some of the common bait fish groups used for pole and line tuna fishing in Lakshadweep (Koya et al. 2019).
- Over 60% of Lakshadweep's fish catch is cured to form a smoked and dried tuna product called *masmin* and the rest is sold locally. *Masmin* is transported via government and private ships from Lakshadweep to ports on the mainland for export to end markets in Sri Lanka, Southeast Asia and Japan (Bhatta 2006).
- In addition to the pole and line fishery that primarily targets skipjack tuna, some of the other fishing practices that are commonly observed in the Lakshadweep include handline fishing for yellowfin tuna, trolling for different tuna and pelagic fish species, near-shore fishing for pelagic species like half-beaks and needlefish using encircling nets, fishing for lagoon and reef fish using hand lines and a variety of nets, and reef gleaning for octopus, cowries and other shells (Hoon 2002, 2003; Koya et al. 2019). In recent times, boats from the mainland that collect fresh yellowfin tuna have also started operating with permissions from the Lakshadweep Administration, opening a new channel of marketing for the fish catch in the islands (Koya et al 2019).

B. Lakshadweep's pole and line tuna fishing - a bright spot for India's fisheries

- Pole and line fishing being a selective, low-impact practice, is one of the most sustainable forms of commercial fishing globally. The fishery selectively targets skipjack tuna, a small, fast-growing, early-maturing fish (Jaini et al. 2017) that is widely distributed in the Indian Ocean. In the Lakshadweep, it helps keep the fishing pressure off the coral reefs, thereby preventing reef degradation and ensuring the survival of the people on the islands (Jaini and Hisham 2013). The fishery also plays an important role in securing sustainable livelihoods for the islanders.
- At a time when there is increasing evidence from different parts of the world on the impacts of industrial fisheries on the health of the world's oceans and the cascading effects this has on the ecosystem services provided by the oceans (Jennings and Kaiser 1998, Crowder et al. 2008) Lakshadweep's pole and line fishery stands out as a bright spot in the world's fisheries by ensuring environmental sustainability without compromising on the food and livelihood security of the islanders (Khot 2018).

- This balance has been possible because of the traditional lifestyle of the islanders that is deeply interwoven with the sea and its resources and has evolved over centuries for a healthy coexistence between humans and their environment. It is important to note that such examples of bright spots are few and far between.
- It is crucial to preserve such practices and allow them to operate unhindered in order to meet India's global commitments to sustainability such as the UNSDGs, in particular - SDG 14 (Life Below Water).

C. Evidence of self governance and community capacities to engage in participatory decision-making in the fisheries sector

- The fishing community in Lakshadweep has, on numerous occasions, demonstrated the ability to engage in novel and participatory approaches to fisheries management. In 2014, following a process of consultation with the fishing community in Bitra, the Village (Dweep) Panchayat - Bitra and the Lakshadweep Fisheries Department, temporal closures to protect a large spawning aggregation of groupers were implemented (Karkarey and Yadav 2015).
- The high literacy rates of the UT of Lakshadweep (second highest in the country) have empowered the pole and line tuna fishers from Agatti, Kavaratti, Kadmat and Minicoy to participate in a long-term, voluntary, community-based fisheries monitoring programme and collectively contribute over 4000 fishing records to a unique, community-generated dataset, thereby demonstrating fishers' potential to participate in and contribute to scientific data collection for fisheries monitoring (Dakshin Foundation 2020).
- Over a series of co-management consultation meetings held in Kavaratti, Agatti and Minicoy islands in May and June 2019, pole and line fishers along with representatives of the Fisheries Department and the Village (Dweep) Panchayats discussed local fishery issues and adopted resolutions to curtail potentially unsustainable fishing practices such as LED-light fishing for baitfish at night, use of small-meshed baitfishing nets and dumping of tuna waste in the lagoons (Dakshin Foundation 2020).
- Though facilitated by the local administrative units or by external organisations, the above examples demonstrate a strong sense of stewardship, strong social cohesion, the ability to self-govern, ability to forfeit short-term personal gains in the larger long-term interests of the community and to resolve conflicts internally. Additionally, these islands also have well-defined, indigenous systems of natural resource management based on the traditional ecological knowledge (TEK) of the community, for example, the customary fishery management practices followed on Minicoy island (Sivadas and Wesley 2006, Dakshin Foundation 2020). Such internal strengths of the community extend to sectors such as education, land governance and coconut farming on these islands. These are considered ideal and critical prerequisites within a community to facilitate not just equitable social development, but more importantly, to facilitate economic development

(Easterly et al. 2006; Schiefer and Noll 2017). In a world where social cohesion is considered to be rapidly deteriorating, particularly on mainland India, the Lakshadweep Islands stand out as a bright spot.

D. Implications of proposed developmental plans for Lakshadweep's fisheries

- The development landscape of Lakshadweep is rapidly changing with a strong focus on bringing in high-end, infrastructure-heavy tourism along the same lines as the tourism model of the Maldives. The incompatibility of the Maldives model of tourism with Lakshadweep has been detailed in Annexure 5. The draft Lakshadweep Development Authority Regulation (LDAR) 2021, provides an enabling framework to identify and acquire land for developmental activities and can severely affect fishers' access to the land and the lagoon. Due to the draft LDAR's outright incognisance of the local social-ecological context of the Lakshadweep, it can undermine many of the inherent strengths of the communities and their values and capacities for strengthening sustainable and locally-appropriate development. Detailed concerns with various aspects of the draft LDAR have been listed in Annexure 1.
- Tourism activities on islands are typically carried out on beach spaces, lagoons and the reefs which happen to be critical areas for fisheries as well. Land areas such as beach spaces are crucial for ancillary fishing activities such as landing, processing and drying of fish catch, boat maintenance activities, boat storage during the monsoons, repair of fishing nets and fish sales, as well as for octopus hunting and other shore-based fishing practices (Rao and Majumdar 2018).
- Similarly, the lagoons, which are critical habitats for several marine species, are also very important from a fisheries standpoint. Pole and line fishers depend on the lagoons and reefs for baitfish to catch tuna. Fishers scout the lagoons for small baitfish before heading out to the open ocean to catch tuna. In addition to baitfish, fishers also depend on other lagoon and reef fish resources, especially during the monsoons when the seas are rough, making it difficult to venture too far from the shore. Lagoons and the surrounding reefs buffer the islands from strong winds and provide a safe harbour for fishing boats to berth. The proposed lagoon villa-based tourism model could severely limit fishers' ability to access the lagoons and their resources.
- Favouring high-end tourism over other well-established livelihood activities such as fisheries can restrict fishers' access to land and lagoons and cause disproportionate impacts on the local economy and nutritional security of the islands. While it may be argued that tourism development would boost the economy, it is unclear as to how much of the revenue and benefits from the sector would actually trickle down to the local community of Lakshadweep. A high-end tourism-based development model will directly overlap with the needs of the fisheries sector which is currently the highest revenue

generating sector on the islands and operates within the ecological and resource limits of these islands.

- Fishing practices in the islands that have evolved over centuries depend on local natural resources and confer a certain degree of self-dependence and resilience upon the islands. Such resilience is all the more important for these islands which are highly vulnerable to the impacts of climate uncertainties and, in recent times, also factors such as pandemics, which can hinder the connectivity between the islands and the mainland (Bennett et al. 2020). The pole and line tuna fishery of Lakshadweep is the key link that can ensure the social, ecological and economic integrity of these islands, if managed well. However, the proposed developmental activities pose the risk of undermining the existing sustainable livelihoods, cultural identities and trade connections that have been forged over centuries.
- International instruments such as the FAO's Small-scale Fisheries Guidelines (FAO 2018), stress on the importance of protecting the tenure rights of small-scale fishing communities, ensuring access to fishing grounds and land for allied fishing activities and meaningful consultations with communities prior to ushering in large-scale developmental changes. The potential impacts of the proposed developmental vision for the Lakshadweep islands must be examined not only from a fishery resource or an ecological point of view but also from a basic human rights perspective. The pursuit of the blue economy must not come at the cost of blue justice (Bennett et al. 2021).

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Annexure 5

The Maldives model of tourism and it's incompatibility with Lakshadweep

The Lakshadweep Union Territory, at a population size hovering around 70,000 people over only 10 inhabited islands out of 35 (one island has submerged), about 200-400 km away from mainland India, makes the archipelago a perfect model for strengthening self governance, self-reliance and inherent social and ecological resilience to external drivers of change. Insecurities in food, health, education and employment, that come along with being small isolated island systems, have mostly been managed well in the past three decades (Niti Aayog SDG India Index 2019-2020). Lakshadweep markedly has an above National average Literacy Rate at 93%, the lowest crime rate in the country, an equal sex ratio and gender equity, and a below average birth rate with slow population growth. The ecologically precarious nature of the islands is deep seated in its people. This has been acknowledged in all past Island management plans and decisions for its development (See Annexures 2,3,4). The Lakshadweep is at that point in history from where it can creatively and progressively strengthen and diversify on this trajectory; but if it is made to instead follow the development paradigms as on the mainland, it risks losing everything; just as unnecessary and irresponsible construction & infrastructure is wiping away beaches, wetlands, rivers and lakes on the mainland, making coastal cities prone to floods, and inland cities prone to drought.

In April 2021, the Lakshadweep Administration proposed the draft Lakshadweep Development Authority Regulation (from here on called LDAR), and since then faced much resistance on the islands and in the mainland, India. It has led to a series of assessments and analyses of the draft in light of the archipelago's future, when climate change will make inhabitation itself a challenge (See Annexure 2). The LDAR, as shown in other annexures of this letter, has no mention of ecological and social safeguards while 'developing' the islands, but what it does make clear, is that it aims to acquire land for 'development' mainly infrastructure related. The Administration also proclaims they want to adopt the Maldives model of tourism development in the Lakshadweep (Babu 2021) for employment and income generation, while on the pathway to develop Kavaratti as a 'Smart City'(www.smartcities.gov.in)

In this section, we summarise and compare the Maldives and the Lakshadweep archipelagos - their geography, ecology, socio-politics, administration and economy. We critique the past and current model of tourism development on the Maldives to make our case that the Maldives development trajectory of unmanaged high-end tourism or the recent guesthouse models without safeguards, cannot work for the Lakshadweep; and how in fact it has caused damage to Maldivian natural resources, diversity, ecosystems, society and culture.

A. The Maldives - Lakshadweep islands

A1. Geography

The Maldives and the Lakshadweep archipelago's are located on the Chagos-Laccadives ridge, a prominent feature of the mid Indian Ocean basin, which runs from 9S to 14N of the equator. The Maldives archipelago occupies the central and largest part of the ridge while the Lakshadweep occupies the northern part of the ridge. The Maldives is a recognised ecological hotspot, with the seventh largest reef system in the world containing over 5% of the world's coral reefs and supporting over 1000 fish, 300 coral and 350 crustacean species (Emerton et al., 2009). Maldives has an exclusive economic zone (EEZ) of almost a million sq.km, whereas the Indian EEZ around Lakshadweep covers around 400,000 sq.km. The Lakshadweep archipelago is also a biodiversity hotspot, identified by the IUCN as a 'Hope Spot' in 2013. The complex underwater topography and bathymetry makes the entire Chagos, Maldives and Lakshadweep region rich in diverse marine megafauna (Riley et al. 2010, Anderson et al. 2012, Panicker et al. 2020) including more than 15 species of whales and dolphins, and has been listed as an Important Marine Mammal Area in 2019 (www.marinemammalhabitat.org), a tool used under the Convention of Biological Diversity, that India is a party to.

A2. Bathymetry and atoll structure

The Maldives has 1192 islands of which 194 are inhabited (population size ~540,000), whereas the Lakshadweep has only 35 islands of which 10 are inhabited (population size ~70,000). Although both the Maldives and the Lakshadweep consist of mid-oceanic coral atolls, the underwater topography of the Maldives comprising 26 natural atolls is different from that of Lakshadweep. Lakshadweep islands consist of smaller atolls with fewer reefs and islands - usually one atoll has one or two islands on it - separated by deep open ocean waters. Maldives has some large atolls that are 10's of km in diameter and lagoon depths ranging from 50 to 100m (Risk and Sluka 2000). Within the atolls, there are several ring reefs or faroes that are miniature atolls (Risk and Sluka 2000). The atoll rims accumulate sediment, thereby forming islands (Woodroffe and Biribo 2011). The

southern Maldivian islands have deeper lagoons and fewer faroes compared to the northern islands (Risk and Sluka 2000) and Lakshadweep.

A3. Fishery

The dominant fishery in the Maldives is the traditional pole and line tuna fishery practised for over a 1000 years. This type of fishing historically resulted in low levels of reef fishing on the archipelago, and thereby increased the reef's resilience capacity to adverse climate events by retaining important fish groups (Yadav et al. 2019).

Lakshadweep adopted this tuna fishing technique in the early 1960s (James et al. 1987) and is currently the most sustainable form of fishing and fisheries in India, providing food security to the island communities, and a permanent source of income (see Annexure 4). Both the Lakshadweep and the Maldives though are facing the grave threat of over-exploitation of the valued Yellow-fin tuna (*Thunnus albacares*) that migrate through these waters, by international fleets of purse seiners, drift gill netters, tuna drift gill net fish aggregating devices and longliners (Indian Ocean Tuna Commission 2021). For islands that are already vulnerable to food insecurity, the over-exploitation of their primary valued resource is not to be taken lightly.

A4. Weather Patterns

Both the Maldives and Lakshadweep are influenced by seasonally reversing winds and currents and have two monsoon seasons namely; the southwest monsoon and northeast monsoon seasons. The Lakshadweep along with the northern Maldivian islands are heavily influenced by monsoonal winds, storms and currents, more so than the central and southern Maldivian atolls. The southern Maldivian atolls are more equatorial in climate (Anderson 1987).

A5. Climate change

The isolation of island territories makes them vulnerable to climatic forces that increasingly threaten their survival. Global warming, causing sea level rises from thermal expansion and melting continental ice could submerge some islands or make them uninhabitable in the next 50 years - such as Tuvalu, an island country in Pacific Ocean and is likely to have significant impacts in the northern Maldives and Lakshadweep (Han et al. 2010). In the Maldives, the threat of sea level rise is accepted not solely as an environmental issue, but also an issue of security and human rights (Nasheed 2009).

Increasing water temperatures cause widespread bleaching events, coral mortality and habitat degradation and threaten Maldivian reefs (Pisapia et al. 2019). Fortunately, coral recovery after severe bleaching events was higher in the Maldives than other sites in the Indian Ocean (Morri et al. 2015, De Falco et al. 2020). This recovery is ascribed to high biomass of herbivorous fish, large connectivity among reefs, limited pollution and

eutrophication and existence of refuges where corals were protected and thus repopulated degraded reefs (De Falco et al. 2020). These refuges may in part be due to local surface water currents and bathymetry that cool waters by 0.2 degC in the warmest season (De Falco et al. 2020). It is yet unknown how localized oceanographic factors impact the northernmost islands of the Lakshadweep archipelago given the winds are stronger and underwater bathymetry varies from the Maldivian atolls.

A6. Administration

The Maldives is a Nation State, and one of the ‘Small Island Developing States’ (SIDS) most threatened by Climate Change, and is listed by the United Nation Framework Convention on Climate Change (UNFCCC); whereas the Lakshadweep is a Union Territory (UT) of India, facing similar risks from climate change. The Maldives is a democracy with an elected government whereas the Lakshadweep does not have a legislative assembly and is directly governed by the Union Government of India through an Administrator. Lakshadweep has district and island level panchayats or self-governance bodies, the members of which are elected, and which work in parallel with the centrally run Administration.

A7. Food security & Economy

Atoll islands and small islands come with some similarities with limited resource availability - energy, water, agricultural produce, meat and products of daily consumption, and a dependence on imports from mainland or other countries. A balance between food imports and self production is often not possible. In the Maldives, in 2019 Per Capita product export was \$476 against \$4.05K of import; with exports including fish and fish products and petroleum gas (The World Bank - Maldives accessed online), while major imports were of food, daily provisions, wood, furniture, and refined petroleum. In the Lakshadweep, food security is limited mostly to coconut, marine resources, indigenous plant sources and products related to these. Even rice, a staple requirement, is imported from the mainland. Increasing economic self-reliance of the island communities, including food security is of primary importance, but would require innovation in agriculture and food processing and shifts in production via cottage industry and formation of marketing cooperatives. The subsidies provided by the Government of India (GoI) to the Lakshadweep UT, creates an imbalance in power and a vulnerability that can easily be misused. Extensive and unmanaged Tourism as an export, has been the path that the Maldives and several other SIDS used since the late 1900's to fill this gap in income generation. But balancing the fragility of available natural resources with the unlimited needs of tourism development is a matter that is nuanced and needs to be addressed democratically with decision-making dependent on local governance bodies.

B. A Review of Tourism development in the Maldives

Tourism in the Maldives began almost 50 years ago, wherein the first resort in the Maldives was established in 1972. Of the 998 uninhabited islands, 152 are developed as resorts under the Maldives' one island-one resort policy (Ministry of Tourism, Maldives accessed in 2021). Luxury tourism was/is largely controlled by the Maldivian elite. Historically, Europeans dominated the tourism sector. More recently, Chinese tourists dominate the market (Stevens and Froman 2019).

B1 Socio-politics

Maldives officially started tourism with two resorts in 1972, by 1985 there were 55 resorts and by 2009 the number increased to 97 resorts, and in 2020, close to 150, all with the ability of getting a lease extension for 50 years. It must be noted here that the political regime during the time of the initial spurt in the tourism industry, ran the industry in an extremely centralised manner, sometimes without legal tenders or pre-decided the tenders and investments from foreign enterprises, with almost no public consultation.

The rise in the high-end luxury tourism industry in the Maldives overlapped with a period of extreme human and environmental rights violations (Scheyvens 2011). The lack of basic facilities for outer islanders, malnutrition in children, strikes at resorts, and public protests are issues that were not brought to the notice of the International community even though the country earned around 70% of its foreign revenue from its exploitative tourism sector and is touted as Sustainable (Scheyvens 2011). Maldives also has a very high rate of divorce, and male members being away at island resorts has been linked to an increase in substance abuse and juvenile delinquency (Keller 2010) describing the types of societal repercussions of a business model that are not sensitive towards cultural needs and human rights.

The typical model, then and since, has been to lease out an entire island or coral lagoon to the operator of a single resort, skewing the industry in favor of large developers over small business people. The lack of community engagement in support, planning, and decision-making for tourism was evident when local community members protested against a proposal to build a hotel on the inhabited island of Fuvahmulah on the basis of the negative impacts that it could bring to the locale (Zahir, 2005 in Shakeela et al 2011b). Yet, in 2014-2015, 50 new resorts and submerged lagoons were leased out illegally without public tenders, exposing the much acclaimed Maldivian tourism model to be shrouded in corruption and bribery (OCCRP 2018) with a scam of more than 80 million USD.

B2. Employment

Even after 50 years of the tourism sector in the Maldives, locals do not see the industry as a sustainable source of employment (Shakeela 2011a). Shakeela et al. (2011a) showed that the tourism industry in the Maldives does not create employment for full engagement of locals. Estimates suggest that approximately 53% of the tourism workforce consist of expatriates. In terms of employment quality, more than half of all managerial and supervisory jobs were given to expatriates, while most of the functional jobs were given to local employees. The disparities between local and expatriate employees' income levels was very wide and much lower than that of expatriates. The election of a new President helped change this status quo and new laws were introduced to make Maldivians more involved in owning and running businesses. Yet some serious social and environmental fall-outs from a high-end tourism industry are still rampant.

B3. Ecology & Environment

The blatant lack of environmental monitoring and inadequate Environmental Impact Assessments (EIAs) before, during and after resort construction are a major issue in the Maldivian model of tourism growth, and several regulations are flouted causing much concern for the sustainability of these island resorts during times of extreme climate change events. Luxury tourism also makes heavy demands on freshwater and energy resources, and creates high volumes of waste; with inadequate waste segregation done at the resorts and no recycling systems in place, undesirable materials often leach into the marine environment. Moreover, luxury resorts or an unregulated number of tourists flying into the islands - most of whom are on medium to long haul flights - even for the recent budget guesthouses, are carbon intensive.

Island stability: In the Maldives, sampling of 608 islands show that human activities drive morphological changes to the reef-island system (Duvat and Magnan 2019). Land reclamation, harbour development and the dredging of sediment from the reef flat or lagoons obstruct the transport of sand and sediment along the shoreline, thereby leading to the need for artificial coastal protection structures such as seawalls and groynes. Between 2006 and 2016, the number of islands with an “entirely natural” shoreline decreased by 13.8%. Of the 608 islands studied, 33.1% of the islands had modified shorelines in 2014-16 (against 22.4% in 2004-06). The detrimental effects of infrastructure development on the reef-island system is rapid and widespread in the Maldives. In the inhabited and exploited islands (where tourism, agriculture, aquaculture, industry, infrastructure have been developed), the natural capacity of the islands to adjust to climate-related changes is reduced or even totally lost. While islands with little or no disturbance remain stable or increased in size ‘naturally’ in the past decade (Duvat and Magnan 2019), thus suggesting that natural undisturbed atoll ecosystems can still adapt its bio-physical form to climate-related changes in ocean conditions. With over a million

tourists visiting the Maldives in a year, the impact on its reef-island system is enormous. Cowburn et al. (2018) underscores that the initial construction of a resort and dredging results in lower coral cover, fewer mature coral and more loose sediment.

Reef fisheries: Over the last two decades, the expanding tourist industry has driven an increased demand for reef fish (Sattar et al. 2014). Reef fish purchases in resorts are directly proportional to bed capacity (Sattar et al. 2014). Historically, there has been low fishing pressure on Maldivian reefs since traditional fisheries focused on pelagic tuna - this emerging demand for reef fish selectively removes important functional fish groups, thereby altering fish size structures and assemblages on the reef (Zgliczynski & Sandin 2017, Yadav et al. 2019). After the effects of initial construction, dredging or land reclamation – that may last for years – reef fish communities may improve as immediate areas around resort islands are designated as no-take zones apart for light fishing done by tourists or staff (Moritz et al. 2017). This excludes local fishers from these areas. Conversely the tourist resort demand is fulfilled by fishing in further reefs. This is likely to negatively impact reef fish stocks across the country (Moritz et al. 2017).

In addition to reef fish for food, recreational night fishing is offered by resorts as a tourist activity. The mean lengths of caught fish are smaller than fish caught in the commercial reef fishery. The scale and impacts of these are not fully quantified (Sattar et al. 2014). Sattar et al. (2014) recommends several measures to regulate this fishery such as licensing of reef fishery vessels, mandatory reporting of catch data, stakeholder consultations, implementing size limits, identifying and protecting key spawning sites, and to discontinue recreational fishing trips in resorts altogether.

Freshwater availability: Atoll islands have two natural sources of freshwater - rainwater and groundwater. In small atoll islands, the fresh groundwater lens is thin with a brackish mixing zone, separating the freshwater lens from the seawater below (Werner et al., 2017). The risk of saltwater intrusion into this aquifer is very high in case of over-exploitation (population increase or tourism requirement) or low rainfall (climatic changes); or contamination with surface run-off.

Water consumption at resorts and hotels based on a luxury resort chain in Europe is estimated to be 380-1100L/guest per night; in India, tourist water consumption is estimated to be 135L/per person/day much higher than what non-tourists use; while a functional swimming pool uses 60L/guest/night. A study carried out on the inhabited Magoodhoo island (133 families) of Faafu atoll estimated per family consumption of water to be 23.8L/day (Acciarri et al 2021); and per person to be 4.35L/day; with bottled water imports at more than 11000L/year, to meet the freshwater need of 133 families. Moreover, domestic and touristic activities producing organic matter and wastewater

were the primary contaminants of groundwater here (Leoni et al 2021). Other sources of contamination were poultry farms and vegetable gardens. Bottled water leads to yet another larger problem of solid waste management. Just like Magoodhoo island, other rural islands, inhabited and resort islands are already water scarce in the Maldives.

Given that the topography of an island changes the amount and quality of the freshwater in the ground, groundwater aquifer studies and management measures need to be carried out for all islands, before making development plans. Improving water quality by artificial recharge, rain water harvesting, carrying out periodic disinfection of the wells and saving the fresh water stocks in the island according to island needs is required. A few studies have been carried out in the Lakshadweep. Singh et al. (2009) identified potential fresh groundwater resources with vulnerable parts for Andrott Island; Prasad and Hameed (2010) found that there was a fluctuation in groundwater level in the Minicoy Island, within the range of 0.07 m–0.50 m; Najeeb and Vinayachandran (2011) studied how rainfall and its surplus influences the groundwater quality of Lakshadweep. In Kavaratti, the north and northwest part of the aquifer is deeper and also less at risk from contaminating groundwater than the south and southeast (Anthony et al 2020), making the north and northwest most suitable for people to occupy. However, Joy et al. 2019, found trace element deposition in the lagoon and shores of Kavaratti and found that lead (Pb) in the groundwater remains an eco-toxicological risk for this island, making it unsuitable for drinking, irrigation and industrial purposes. Such detailed analysis and monitoring of the groundwater is very important while developing small atoll island systems.

Given these statistics, studies on water quality, and knowing how stressed and at risk the groundwater sources already are, the proposal of ‘development’, on the lines of ‘Smart City’ or ‘Luxury tourism’ is bound to not only produce intense conflict and competition, but also lead to contamination and salinization of groundwater tables. Water security is already threatened and can get exacerbated without a cap on utilisation, and requires alternative management systems like sewers, rainwater harvesting, water holding facilities put in place just for basic needs of a small tourism industry. While desalination plants can be put in place in island resorts, the waste produced from the same is still to be dealt with in any development plan; as is the planning for septic tanks and sewer systems and treatment plants for all the same.

Waste and Sewage: Waste management and sewage disposal is a major concern in the Maldives. Most of the waste is generated either in the greater Malé region or by resort islands (Stevens and Froman 2019). Per capita, tourists from resort islands generate more than 4 times the waste generated by a local inhabitant in an island outside Malé and more than twice of a person from Malé. Waste from north Malé atoll is taken to the ‘Rubbish Island’ Thilafushi - an island set aside to dump waste - and disposed of by open burning

causing an increase in air pollution in the area (Stevens and Froman 2019). Heavy solid waste is also dumped out in the sea. Resort islands are required to have sewage treatment facilities, but many discharge directly to shallow reefs (Stevens and Froman 2019). In 2015, the Maldives started a national waste management initiative to deal with this enormous problem.

To address water access and sanitation matters is a task to be achieved within the UN SDG framework before the year 2030. While the Niti Aayog 2019 plan and the Smart City project for the islands has listed these concerns and management plans, the LDAR 2021 fails to address how they will deal with the large quantities of waste and sewage generated as by-products of the Luxury-tourism model, and how they hope to mitigate its impacts on the local inhabitants and the shared common resources.

B4. Legal and policy frameworks

The Maldives' Environment Protection and Preservation Act (EPPA) 4/93 covers biodiversity, species conservation, environmental impact and land use development and mandates EIA of development proposals. The Maldivian Land Act 2002 deals with allocation of land for various purposes and works in tandem with the EPPA (Techera and Cannell-Lunn 2019). Under the EPPA, 42 protected areas are set up covering reefs, lagoons, mangroves, beaches and wetland. The regulation is effectively enforced only in one of these areas; due to enforcement challenges, the rest remain as protected areas on paper. In some areas, both tourism and construction has occurred such as Mendhoo, Rasfari and Bathalaa. Additionally, the Maldives Environmental Protection Agency (EPA) identifies 274 'sensitive areas' locations where only minimal developmental practices are allowed (Stevens and Froman 2019).

The Maldives, as is India, is signatory to several international conventions and treaties on biodiversity and environment (e.g., CITES, CMS, CBD, IOTC, Ramsar convention, Paris agreement, Refer to Annexure 2 Section C). The Maldives have a 'Sustainable Development Goals (SDG)' division under its Ministry of Environment and Energy, established to specifically address gaps and integrate the 17 SDGs to local development strategies (Techera and Cannell-Lunn 2019). In 2011, the United Nations Educational, Scientific and Cultural Organization (UNESCO) designated a World Biosphere Reserve in Baa atoll. Some core areas within this reserve are relatively better protected and managed (Stevens and Froman 2019). Recognising the need for conservation and sustainable use of biodiversity and the need to strengthen law and governance, the Maldives set up a National Biodiversity Strategy and Action Plan (NBSAP) 2016-2025 (Techera and Cannell-Lunn 2019).

Under the Maldives Tourism Act (2/99), the Regulation on the Protection and Conservation of Environment in Tourism Industry (RPCETI) specifically aims to protect the environment and facilitate sustainable development of tourism. In this regulation, on one hand there are provisions to engage in several highly damaging activities such as dredging of lagoon and reef, reclamation, construction on the lagoon and beach, felling of trees, importing and exporting living species after obtaining permission from the Ministry of Tourism and Civil Aviation, and an EIA is completed under the EPPA. On the other hand, following the construction of the resort, it prohibits removing coral from the lagoon and reef of leased islands, felling of trees, disturbing protected species, using groundwater for construction purposes or guest and staff use. It also requires 80 percent of the land to be left unbuilt and a desalination plant and incinerator to be built. The regulation states that waste and sewage should be disposed of in a manner that is harmless to the environment. It does not lay down clear stipulations on how this can be achieved hence leaving room for arbitrary interpretations. Some provisions allow tourist vessels to dump waste and sewage away from the islands. It concedes that hasty actions without considering alternative options to cater to the increasing demand for land, modern infrastructure and economic growth have resulted in serious habitat destruction and biodiversity loss (MEE 2015) in the Maldives.

When the Maldives started tourism more than half a century ago, concepts of ‘sustainable development’ and ‘ecotourism’ that include environmental safeguards and consider safe limits were emerging topics. Over the past few years, the Maldives have increasingly tried to set up protective measures through its legal and policy frameworks, although several still are not enforced effectively. Of these legal instruments, tourism development and construction are chiefly governed by EIA provisions strengthened over time. Nevertheless, there are many challenges remaining. For instance, the on-ground effectiveness, implementation and enforcement under several regulations are regularly questioned or found to be unsatisfactory (Techera and Cannell-Lunn 2019). The NBSAP acknowledges that the dispersed nature of the communities and island pose enforcement challenges (MEE 2015). Wandesforde-Smith, 1989 & Wood, 2002 show that EIAs with public consultation at every stage work best when there is a specific legal instrument for its application and when authorities are required by law to consider its results in their decision-making. In Lakshadweep, although existing regulations require such measures, the proposed LDAR disregards this important step.

In the Lakshadweep, the Administration appears to be working in reverse by introducing the LDAR. Despite there being law and policy frameworks to encourage sustainable development as detailed in sections above (Annexure 2 Section C), the LDAR aims to supersede all these frameworks and facilitate unchecked construction and land use changes downgrading existing environmental and livelihood safeguards. It replaces

safeguards with an unsustainable and at times scattered idea of development that lacks vision. Instead, we should be learning from the trajectory of Maldivian tourism development and its challenges and opting for a different model that is locally appropriate and more suited to the culture, ecology and social aspects of Lakshadweep.

C. Why the Maldives model would not work in lakshadweep

A point to be made here, is that we need not repeat the same mistakes that have already been made in the Maldives. Instead we can create a tourism model that offers an experience which is personal and helps connect the tourist to the place and the biodiversity; that is ecologically sensitive and culturally rich; and directly benefits the local population of the islands.

The Planning Commission in 2007, in its Development Report prepared for Lakshadweep highlighted that *“Ecological protection should constitute the top priority for the island people since it is the basic condition for their survival and growth.”* The Integrated Island Management Plan (IIMP) 2017, identified islands and regions that could be developed for sustainable tourism following Island Protection Zone 2011 guidelines. The focus on ecology and consultation with communities was further strengthened by the Justice Raveendran Committee which in its final recommendations highlighted that *“All developments envisaged in the IIMP shall be implemented in consultation with the elected local self-government bodies. Considering the fragile ecosystem, all forms of development by Government or otherwise (except any guarded development for carefully predetermined operational constructions), shall uniformly adhere to the IIMPs.”*

The Island Development Authority (IDA), formulated in Kavaratti in 1988, created a framework for the development of India’s island territories that strongly disapproved of the Maldives model of tourism development, stating that the industry had to be people-centric and that which protects and enriches the island's fragile coral ecology. The tourism industry of Lakshadweep (Hoon et al 2011, 2020) first started on Bangaram with a privately owned resort that was developed mainly for dive tourism in 1988 showed that the potential for the industry is high, given that local islanders are included in the benefits, environmental damage is limited, and the process is conducted in a fair and transparent manner. Owned by the people of Agatti, Bangaram was leased by them to the Lakshadweep administration via SPORTS (Society for Promotion of Recreation, Tourism and Water Sports). The resort had a staff of 60 people of which 54 were Islanders and 6 from the mainland. The resort catered to a high-end clientele, with only 30 keys, and hence allowed the management to keep the ecological damage minimal, and a cultural, natural experience quality high. In 2009 the resort was caught up in litigation between the owner and the SPORTS department of the Administration, and since then SPORTS has

continued to run the resort, and organise the entire tourism sector in Lakshadweep, which includes the SCUBA training for islanders to become dive instructors and start dive centres run by locals. This model has been working well (Kokkranikal et al 2003) in Bangaram, Kavaratti, Agatti, Kadmat, Amini. The industry began in Agatti in 1996, and while the resort was also low volume and high-end, the ownership was international and it soon fell into litigation in 2011, with the Administration (Hoon and Babu 2012). The model of tourism had been a success in both cases. Since the late 2000's home-stays and guest houses have been tried but administrative limitations have not allowed this industry to grow or offer quality experiences. Yet, a public-private partnership, using community-based tourism models, which are small-scale, local and soft on resource extraction, considering the Justice Raveendran Committee report and the IIMP, would be the development trajectory to follow.

In 2018, Kavaratti, the capital of Lakshadweep, was included in the 'Smart City' project (www.smartcities.gov.in) and is in Stage 2 as of February 2021. Certain projects that involve 'Land acquisition' (thus affecting livelihoods and traditional customs), for beach road widening, beautification of the beaches, planning roads in CORAL (Conservation, Optimization, Rejuvenation, Accomplishment and Livable) areas to manage traffic and building infrastructure for locals and tourists, has been identified as Risky in the SWOT analysis. We need to realise that the islands are desirable to the tourist and to the developer just because the beaches are still there, and the narrow roads have no traffic to manage.

Yet, in 2020, the Lakshadweep Tourism Policy 2020, was proposed to build high-end resorts on inhabited islands (Kadmat, Kalpeni, Minicoy, Amini), based on a carbon and resource intensive Maldives model of tourism. In the Maldives, resorts are built only on uninhabited islands and by that very fact do not appropriate the resources of the local people on inhabited islands. Hence there is a mismatch between what the administration is proposing and what is followed in the Maldives. Even if the Lakshadweep Administration was to bring such a measure, the number of uninhabited islands in the Lakshadweep archipelago is a fraction of those in the Maldives, and these play a crucial role as refuges for neighbouring reefs of inhabited islands and is a critical resource that the community is dependent on (See Annexure 2 Section B.3). This further proves that the Maldives model of tourism is inappropriate for Lakshadweep. If tourism needs to be developed in Lakshadweep, a locally appropriate model should be designed with advice from expert planners, developers, ecologists, social scientists and the very public it aims to serve – the Lakshadweep people.

Shakeela et al. (2011b) show that in the Maldives model of tourism even after decades, the returns either flow out of the country or are concentrated to a handful of Maldivians

and are not widely distributed amongst the local population. This begs the pertinent question on who this model of tourism benefits and how the Lakshadweep Administration under the Government of India – representing the Indian taxpayer - will justify following a model that is shown to not benefit the local population directly or conserve the environment that local inhabitants depend on for their livelihood, water and food.

As described in the above sections, the Maldives tourism model has several local environmental, social, livelihood, employment and political issues (Scheyvens 2011, Zubair et al. 2011, Shakeela et al. 2011a,b). There is certainly room for improvement and many lessons to be learnt from this tourism model. Therefore, it is with grave concern, we underline that not only is the LDAR inadequate in addressing such issues, it also does not provide for ecological and livelihood safeguards that are currently followed in the Maldives.

D. Changing the ‘Development’ Paradigm

D.1 Community-based Tourism

Tourism in the Maldives is dominated by foreign controlled resorts, with an unequal distribution of profits and benefits. To decentralise the industry, and redistribute resources that reduce this inequality, the tourism sector needs to introduce a community-based tourism framework (Giampiccoli et al 2020) with a small-scale ecologically responsible industry, catering to a range of travellers. Community guesthouses, homestays, and resorts that are built with ecologically sound plans; with a shift to reform the private resorts and hotels also towards the community based tourism (CBT) principle has been proposed in the Maldives. While guesthouse tourism on inhabited islands for budget travelers to encourage local economic development (Chia & Muiz 2021) started in the Maldives in 2010, regulations or guidelines to check uncontrolled development and account for the carrying capacity of the local islands is still lacking in the Maldives (Chia & Muiz 2021) - one of the major pitfalls even of CBT.

Dłużewska and Giampiccoli (2020) identify some fundamental issues that policy makers need to consider while/before developing community-based tourism, in small remote islands, like the Lakshadweep islands (Voon et al 2020), that ensure the well-being of the local population, especially that of the most disadvantaged. These range from addressing and balancing external versus local control of businesses and preventing financial leakages to outside corporations, local elite versus local disadvantaged sections, maintaining close knit communities, preventing overdependence on tourism, expatriate versus local workforce and building education/skills of local workforce, ensuring carrying capacities are within cultural, social and environmental limits, market access and

transportation difficulties arising from isolation and scarce local capital. They specifically acknowledge the role of the government in formulating, implementing and monitoring policies and legislation that promote a shift to a locally controlled tourism sector that is still within the environmental carrying capacity of the islands and equitable across the range of local stakeholders.

D.2 Lakshadweep Tourism Policy 2020

The Niti Aayog report 2019 and the Lakshadweep Tourism Policy 2020 aims to ‘*i. to promote tourism, which is economically viable, environmentally sustainable, socially acceptable and culturally desirable; ii. To promote tourism with the main objective of creating meaningful employment opportunities to local unemployed people of Lakshadweep; iii. To promote tourism to unlock the entrepreneurial potential of local people and make them a part of tourism promotion in Lakshadweep; and iv. To attract investment both public and private in promoting sustainable tourism in Lakshadweep*’.

We do not disagree with these larger goals. However, we strongly oppose the tourism strategies and development paradigms promoted by the government towards this goal, the lack of transparency and consultation with local people, and the sizable control and power that government officials, corporates or businesses based outside the Lakshadweep will have over the development plans. Several examples of tourism models detailed in these policies or reports exist around the world and do not fulfil the goals mentioned (Example: High-end tourism in the Maldives).

In the Lakshadweep tourism policy 2020, the administration appears to list a hotch-potch of activities and strategies and goals that are sometimes contradictory to each other. The lack of ecological inputs in these policies are evident. The policy strategizes to popularize a bed and breakfast scheme in addition to resort facilities, it is not clear how the above issues mentioned by the Dłużewska and Giampiccoli (2020) will be addressed in developing this. The tourism policy acknowledges the need to develop within the carrying capacity of an island, however we could not find scientifically backed carrying capacity estimates in the public domain. Various numbers offered over the years on carrying capacity provide no information on the process followed (IIM-Pune suggested 610 beds; Niti Aayog suggested 1092 beds while the most recent NCSCM suggested a galloping 2523 beds) over the ten islands being proposed for tourism. Several other tourism initiatives such as houseboat tourism appear misplaced for the region. Human resource development has been identified as a limiting factor to recruit local inhabitants to work in the tourism industry. The policy claims it will build skilled capacity on the islands in collaboration with reputed institutes but the pathway for this has not been laid out.

The LDAR and construction industry appears to have taken precedence over such critical components of a local tourism industry going by the regulations the Administration has put out until now. For example, the bids for high-end tourism that happened twice have already not produced any results, for multiple reasons, but there have been no policies on tourism skill development on the islands or clarification on islands' carrying capacities. It is also to be noted that the number of islands proposed for tourism changed from 5 to 10 in 2019-2020.

D.3 Small Island Developing States (SIDS) and the SAMOA Pathway

The trade-offs between ecosystem services and protecting social, ecological and cultural identities for small islands are very delicate. Similar situations arise while developing infrastructure along natural resources such as forests, lakes, rivers, mangroves and shores, even on the mainlands. With the Global Climate Change crisis looming, these islands and other natural ecosystems need to be treated with a specific place-based, ecologically and culturally sensitive paradigm shift in development models. We would like to take this opportunity to highlight one such an all-encompassing and progressive pathway that has been proposed for the development of SIDS called the SAMOA (SIDS Accelerated Modalities of Action) Pathway to prepare for the global climate change crisis. Adopted in 2014, the SAMOA Pathway is the overarching UN framework (The United Nations Framework Convention on Climate Change and The Paris Agreement) for guiding global, regional and national development efforts to achieve the development aspirations of SIDS and is an integral part of the 2030 Agenda for Sustainable Development and its related 17 SDGs. The Preamble of the SAMOA has 124 steps to follow, so that the well-being of the people of these territories and the fragile coastal environment they depend on, while incorporating economic growth models that align with the goals and the vision of the SDG 2030, can both be ascertained. While Maldives is a member of SIDS, small islands such as the Lakshadweep too need to be considered within this paradigm given the similarities in limitations, vulnerabilities and biological importance of these ecosystems (Petzold and Magnan 2019). We suggest adopting the guiding principles of the SAMOA pathway, considering the IIMP 2017 and the Justice Raveendran Committee Report 2018, along with forming a working group led by local self-government institutions along with ecologists, hydrologists, economists, sociologists, urban planners and architects, while designing development plans in the Lakshadweep Islands. Community-based tourism models that can be adapted to local conditions, limitations and culture, thus tailored, customised for Lakshadweep would require deep deliberations and a vision that the LDAR totally lacks.

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