

# The right place. Solid waste management in the Republic of Maldives: between infrastructural measures and local practices

## Abstract

The 2010 UNPD's *Assessment of Development Results* defined the Maldives "a vulnerable Small Island Developing State" by pointing out the influence of both external and local human factors on their fragile ecosystems. This impact is deeply related to a main geographical feature: the high dispersion of land mass and population, both of them spread over a distance of 860 km. Above all, this dispersion has an effect on two environmental issues: energy distribution and solid waste management. The latter is particularly interesting for the geographical analysis of Small Island Countries. Due to centre-periphery distance and cost benefits analysis, in the Maldives public and private actors have developed different solid waste management models: central and regional waste management dumpsites, hybrid systems implemented by resorts and "informal" practices still followed by local communities. In this paper, we discuss these systems stressing on the relevance of combining infrastructural measures with "informal" practices at local level. Furthermore, we report the outcomes of *The Right Place*, a participatory waste management action carried out by MaRHE Center (a Milano-Bicocca Research Center) in Faafu Magoodhoo Island.

## Keywords

Waste management • Small Island States • Maldives • local scale • "informal" practices • public space care

**Stefano Malatesta<sup>1</sup>,  
Marcella Schmidt di Friedberg<sup>2</sup>,  
Valeria Pecorelli<sup>3</sup>,  
Andrea Di Pietro<sup>4</sup>,  
M. Angelica Cajiao<sup>5</sup>**

<sup>1</sup>Department of Educational Human Sciences  
"Riccardo Massa", MaRHE Center  
University of Milano-Bicocca  
Italy  
e-mail: stefano.malatesta@unimib.it

<sup>2</sup>Department of Educational Human Sciences  
"Riccardo Massa", MaRHE Center  
University of Milano-Bicocca,  
Italy  
e-mail: marcella.schmidt@unimib.it

<sup>3</sup>Department of Sociology  
University of Milano-Bicocca,  
Italy  
e-mail: valeria.pecorelli@unimib.it

<sup>4</sup>MaRHE Center,  
University of Milano-Bicocca,  
Italy  
e-mail: andrea.dipietro.pe@gmail.com

<sup>5</sup>MaRHE Center,  
University of Milano-Bicocca  
Italy  
e-mail: angelica.cajiao@hotmail.com

Received: 16 December 2014  
Accepted: 24 March 2015

© University of Warsaw – Faculty of Geography and Regional Studies

## Waste management in Small Island States: a key environmental issue

Both international scientific literature and official reports (UNEP 1999; Kaly, Pratt & Howorth 2002; Roper 2005; van Alphen, van Sark & Hekkert 2007; Gössling & Schumacher 2010) have identified in energy production and waste management two key elements for "environmental vulnerability" (Kaly, Pratt & Howorth 2002) of Small Island Developing States (SIDS). Similarly, the SIDS' Net recently declared: "pollution prevention and the management of waste is both a critical and complicated issue for Small Island Developing States. Small land mass and limited availability of other resources, combined with an increase in polluting and hazardous substances due to population growth, are contributing factors to the difficulty of managing waste" (<http://www.sidsnet.org/>). Over the two last decades, the terms "vulnerability" and "insularity" have been intensely discussed within the contemporary academic debate (Baldacchino 2004; Trablesi 2005; Depraetere 2008a, 2008b; Kelman 2010; Taglioni 2011; Jędrusik 2011, 2014). In particular, the applicability of the first one to specific spatial contexts as SIDS has been questioned stressing the "discursive dimension of vulnerability" in SIDS. This discourse has produced "narratives suggesting that island peoples are unskilled and lack resources, and that their islands are 'tiny' and 'fragile', [these narratives] can undermine

their pride and stifle their initiative, reducing their ability to act with autonomy to determine and achieve their own developmental goal (Scheyvens & Momsen 2008, p. 491). Above all, narratives have been reinforced by a massive plethora of official reports and documents published by international agencies. For instance, in 2010 UNDP adopted "geographical", "socio-economical" and "environmental vulnerabilities" as interpretative frameworks to describe the "development context" of the Maldives. In this paper we discuss the environmental relevance of informal practices developed by local communities in the Maldives; we are aware of the controversial use of "vulnerability" as synonymous of social or economical weakness (Briguglio 1995) however this term will be only applied in the reading of local scale dynamics. We focus on those strategies developed by Maldivian communities to deal with waste production and disposal changes introduced by a complex body of transformative forces such as international tourism market or exogenous consumption models.

SIDS's vulnerability has often been associated to the risk connected to sea-level growing. On the contrary, starting from a trans-scalar perspective, in this paper we analyze the challenges and strategies for mitigation and resilience that Maldivian communities have been adopting. Following this perspective, we can affirm that the emerging environmental challenges people

face in island countries, like the Maldivian archipelago, are: the production and transportation of energy, the availability of drinking water and the management of waste cycle. Also considering, as recently discussed by Gay (2014), that often “SIDS have been instrumentalized by a diverse coalition of experts, activists, journalists, celebrities and politicians” creating a kind of “scenario of raising sea level” (p. 81) or a narrative emphasizing the effect of global climate change as the most dangerous environmental menace for social ecosystems.

The international community emphasized the centrality of waste management as a major SIDS challenge since, at least, the beginning of the Nineties. In 1994, UN published the *Programme of Action for Sustainable Development of Small Island Developing States* (UN 1994). Even if the document clearly followed, formally and philosophically, the emerging trend of sustainability, it currently represents a quite interesting source of information. In fact it listed some environmental priorities for SIDS. Waste management already occupied quite a relevant position inside this political agenda. Five years after, UNEP and the South Pacific Regional Environmental Programme (SPREP) edited the *Guidelines for Municipal Solid Waste Management Planning in Small Island Developing States in the Pacific Region* (SPREP, UNEP 1999). In the introduction, the disposal of solid waste is claimed as a world-wide problem and in particular SIDS of the Pacific increasingly share this issue. Inadequately managed waste disposal is said to have the potential to affect people’s health, damaging the environment of the islands and becoming a barrier to economic development. This general statement stressed the main point that defines waste management as a great challenge for SIDS: the spatial nature of isolated place impacts on waste disposal. The *Guidelines* set a pack of priorities linked to this issue in geographical contexts such as archipelagos and island states: to appoint solid waste center at regional and local scale; to set regulations and norms; to implement recycling feasibility; to prepare landfill plans; and to introduce landfill charges.

The same year, the Seventh Session of the UN Commission on Sustainable Development prepared a report showing the progress of *Programme of Action for Sustainable Development of Small Island Developing States* we mentioned above. The document, titled *Waste Management in Small Island Developing States* (UNEP 1999), confirmed the general glance given four years before, stating that “the unique social, economic and environmental characteristics of SIDS, such as height population density, relative isolation, limited availability of land space and paucity of human and financial resources, limit the range of possible options for the sound management of waste. Waste management is a serious environmental problem for SIDS, more significant than for many other countries” (p. 1). This declaration emphasized the uniqueness of SIDS but it reinforces the narrative of vulnerability. However, it also clarified that waste management in SIDS should be faced using a geographical perspective because this issue is generated by spatial features such as “isolation”, “availability of land” or “population density”. The major impacts on local environment listed by this official report were: the pollution of groundwater; the management of toxic substances; the sewage treatment facilities; the lack of disposal sites; and the lack of facilities for storage hazardous wastes. According to this report, SIDS need for actions at national and supra-national level: integrate waste management systems, reduction of waste total volume, implantation of regulatory frameworks (at national scale); and implementation of regional plans, development of regional technical guidelines, promotion of legal frameworks (at supra-national level).

More recently the UNDP (2010) included sustainable solid waste management among the crucial priorities for archipelagic states such as Maldives, while other environmental priorities focused on marine ecosystems vulnerability, land erosion and climate change.

This broad body of international documents has defined the general principles and priorities connected to the promotion of sustainable waste management in island states. All the same, it helps our analysis to pinpoint those elements that are strongly linked to the Maldivian case: the coexistence of different waste management models within the same State; the geographical relevance of distance and dispersion on solid waste disposal procedures and costs; the need of regional and national regulations; and the impact of exogenous consumption models and lifestyles introduced by the international tourist market. The latter has been clearly pointed out in a number of official documents. Quoting a pair of representative cases: UNEP stated that “protection of the environment from pollution is extremely important for SIDS since aside from other reasons that are common to all countries, two important industries, tourism and fisheries, depend on a pristine environment” (1999, p.1); while Peterson (2013) recently reported to the Ministry of Tourism, Art and Culture of the Maldives upon the impact of waste management on the Maldivian Tourism Sector.

### **Waste Management Systems in the Maldives. Promoting a trans-scalar perspective**

The Republic of Maldives consists of more than 1190 island, the exact amount depends on a complex body of physical, climatic and seasonal phenomena. Its morphology defines this state as the flatters archipelago in the Indian Ocean. As reported by the preliminary document of last official census (National Bureau of Statistic, 2014) the total population of the State is 399.939, spread over a region that extends over an area of the Indian Ocean between 8°10' North and 0°42' South. It should be noted that the number of inhabited islands may vary depending on the criterion used, as a result of a series of political and physical variables. In this paper, we adopted the official governmental definition that identifies 191 local administrative units (189 islands and two cities). In fact, according to the law governing the decentralization of the administrative authority, *The Act on Decentralization of the Administrative Divisions of the Maldives* (Department of National Planning 2010), each island corresponds to an administrative unit on which the political geography of the Maldives is structured. The islands of the Maldives can be classified into four categories:

- islands inhabited by local populations,
- islands used exclusively as tourist resorts,
- uninhabited islands,
- two urban settlements.

The demographic structure of the country is illustrative in itself. Malé and Addu City (Addu Atoll) are defined as urban settlements. The last census indicates that Malé hosted 133.019 residents. The 70% of the inhabited islands have a population less than 1,000 and the majority of these islands, where the 47% of the total population live, count just few hundreds residents. Together with this almost 100 islands, serve exclusively as tourist resort.<sup>1</sup>

The Republic of the Maldives, during the last decades, at least since the Nineties, has been involved by a complex body of transformative forces due to some factors: the increasing foreign investments in the tourism market; the dependency on oil producing countries; and the introduction of new consumption models. The literature on the Maldives has so far mainly focused on a “culturalist” reading these transformations (Maloney 1976, 2012; Romero Frías 1999), while we aim at proposing an alternative analysis based on the pivotal concepts of spatial analysis. In fact, considering demography and human geography, the political geography of the Maldives can be understood by adopting the spatial categories of segregation, isolation and centre – periphery distance (Malatesta, et al. 2014).

<sup>1</sup> Please note that exact amounts depends on the adopted definition (officially in the Maldives there are 101 Resort-Islands).

Table 1. Solid Waste Management Systems and Practices related to four categories of islands

	Local Systems			
	Inhabited Islands	Urban Settlements	Uninhabited Islands	Resorts
<b>Solid Waste Management Systems and Practices</b>				
Dumpsite and open air burning	Majority	No	Yes	No
Onsite incinerator	Few cases	Planned	No	Yes
Waste treatment	Few cases	Few cases	No	Yes
Waste reuse or recycle	Majority	Few cases	No	Yes
Shipping to Central or Regional Sites	Very few cases	Yes	Yes	Yes
Organic fraction dumped in the sea	Majority	Yes	Yes	Yes

As part of the SIDSs, as well as of the AOSIS intergovernmental organization, Maldives share their environmental challenges with more than fifty insular nations all over the world (as listed by the United Nations Department of Economic and Social Affairs, <http://www.un.org/en/development/desa/index.html>). In general terms, Maldivian local communities have to cope with two serious environmental, social and economical issues, both strictly connected at a local scale to the transformative forces the region is facing in the contemporary transition:

- Soil and water pollution due to dioxide emissions and organic waste dumping.
- Major dependence on fossil fuels for energy production (95% of the total demand).

As already mentioned in the previous section, waste management represents a crucial environmental issue for local communities in terms of regulations and technical aspects. The quadripartite classification we referred to (islands inhabited by local populations; islands used exclusively as tourist resorts; uninhabited islands; and urban settlements) can be used as an interpretative framework to analyze a number of social and environmental issues regarding the country, such as waste disposal systems. Similarly Colombo *et al* have recently proposed an overall glance on this issue arguing that: “in most inhabited islands local wastes are burnt at low temperatures in sites that are typically uncontrolled, usually located along vegetation lines or shorelines. Waste management in the resorts islands is more advanced, based on minimizing segregating and treating (making compost) garbage. Each resort is required by law to have an incinerator for leaves, paper, packaging and cardboard” (Colombo *et al*. 2014, p. 500).

This classification is even more descriptive when they referred to the average amount of waste produced by these local systems: 2.5–7.5 kg/person/day in resorts, 0.8–1.0 kg/person/day in uninhabited islands and 0.8–2.48 kg/person/day in Malé (ibidem).

Due to these differences we can affirm that across the archipelago, three different waste disposal and management models have been developed:

- Small and medium-size peripheral islands: collective collection (managed by the municipality such as the Island Councils) and onsite, or open air, burning.
- Urban settlements and big islands: waste collection and shipping to central burning dumpsites (like Thilafushi Island next to Malé).
- Tourist resorts islands: hybrid methods (on site burning, compost, segregating, treating and disposal).

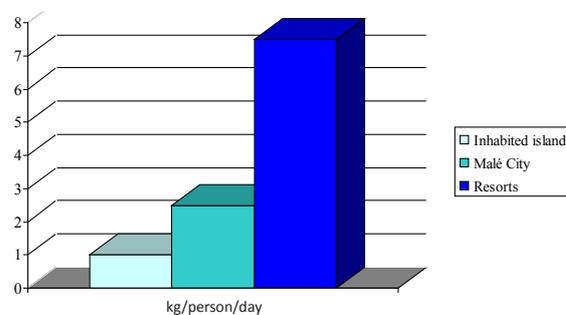


Figure 1. Maximum average amount of waste produced by the different local systems

Source: Colombo *et al*. 2014

Data concerning quantities and components provide us the opportunity of having an overall understanding of the solid waste management in the country. Peterson (2013) estimated 860 metric tons per day of solid waste in the Maldives, with an average of 21% attributed to tourism activities. On the other hand, even data concerning solid component elements are quite explanatory: “island community solid waste reported to have a high organic fraction (70%). Recyclables (metals and plastic) account for only 3% of discards; while the balance of the solid waste is classified as residuals. At tourist resorts the organics fraction was estimated to account for the 89% of discards while the primary components comprise food waste (40%)” (Peterson 2013, p. 8). This report confirms the existence of different human ecosystems connected to waste production, disposal and treatment, and, moreover, it underlines the existence of a local traditional habit consisting in plastic and cans recycling. As a matter of fact, in small and medium-size islands only the 3% of the total burnt and dumped solid wastes is composed by these items. In general terms, the most efficient ecosystems seem to be the tourist resorts where food and organics are separated from other wastes and dumped in the sea while all the other components are treated in onsite incinerators.

These models match with a articulated regulatory body the National Government has set up during the last two decades, citing just few examples (Environment Research Centre 2008a):

- The National Solid Waste Management Policy.
- The Technical Minimum Standard for the Operation of Large-scale Dumpsites.
- The Law n. 4/93: The Environmental Protection and Preservation Act.
- The Environmental Impact Assessment Regulation.

This consistent regulatory body of documents shows governmental efforts in developing the general priorities listed by UN in 1999 (see sect. 1). Still, in this paper, we specifically refer to the 2008 *Environmental and Social Assessment Framework* (Environmental Research Centre 2008b) because the Assessment underlines one of the key feature regarding the Maldivian case by stating that: “the management of solid waste is especially challenging in the Maldives, much more so than other small island states. With a highly dispersed population spread across numerous islands there is little scope for harnessing scale economies as costs of delivering services are high. [...] Finally, a fragile marine ecosystem requires that special attention be given to the choice of technology and system design to mitigate adverse impacts” (Environmental Research Centre 2008b, p. 5).

Beyond the manifest remind to the “narrative of fragility”, this introduction emphasizes, once again, the relevance of spatial features connected to waste production, disposal and dumping. This emphasis clearly suggests the need for a geographical perspective to understand the political and social relevance of this priority. In a certain way if we look at this framework through a geographical lens, we may suggest that those general priorities identified by the National Government came, maybe unconsciously, from a spatial perspective. In fact the so-called National Waste Management Policy is structured on five main tasks:

- Establishing and activating waste management governance.
- Creating waste producers' duties and responsibilities.
- Establishing waste management infrastructures.
- Activating the waste management system at supra-local scale.
- Influencing consumer choices and waste management practices.

The National Waste Management Policy is based on the principle of integrating infrastructures and practices both at local and regional scale. As a matter of fact it aims at overcoming the tripartite model we mentioned before, by the promotion and implementation of two parallel structures. These are: a number of Island Waste Management Centers (IWMCs) across the archipelago, able to deal locally with the management of all the solid waste cycle (production, disposal, dumping and burning); and few Regional Waste Management Sites (RWMSs) where the residual wastes coming from the IWMCs, can finally be disposed. The IWMC is described as “a concrete pad, covered waste storage bays, guttering, a rainwater tank, a chain link fenced enclosure with lockable gates. The solid waste generated by the island communities is brought to the IWMCs where it will be separated into recyclables, hazardous wastes, and residual waste requiring final disposal. The separated wastes will be stored in respective waste storage bays for regular collection and transport to the RWMS” (Environment Research Centre 2008b, p. 28).

By the promotion and implementation of local and regional infrastructures, following a top-down approach, this policy seems to be a promising and capable of coping with the chronic weak points connected to multi-scale waste management. Hence, considering the centre-periphery distance and the costs of a disposal services, this model would be able to ship wastes from isolated places to regional or national dumpsites (for example in Thilafushi). Generally speaking, we can affirm that the National Waste Management Policy, as the other Disaster Risk Mitigation Measures have nationally planned and adopted the interpretive categories of “vulnerability of local systems” and “mitigation of human impact on the major factors of environmental risk”.

Given the general overview of the contemporary waste management model and policies in the Maldives, this paper is discussing the local relevance of the approach promoted by

the government. In so doing, it underlines how local expertise, practices and strategies are often just mentioned, in some cases adopting a well established and structured framework, see for instance the report titled *Developing a User Pays Framework for Island Waste Management Service* (Ministry of Housing, Transport and Environment 2010), but rarely taking into account in terms of the potential drivers within local communities.<sup>2</sup>

### The Island Waste Management Center in Faafu Magoodhoo: a case study between top-down systems and local practices

Faafu Magoodhoo is a small-size island in the Faafu Atoll. Currently, the island's population counts 526 inhabitants (289 males and 273 females). The majority of residents in Faafu Magoodhoo is involved in the fish market at local, regional, national and international scale (above all in the yellow fin tuna catch). The existing solid waste management system on the island can be clustered inside what we defined “collective collection” (managed by the municipality) and on site or open air burning. In other words solid wastes are collected and separated (cans, glass and plastic) by a municipal service, but a considerable fraction is still burnt, without applying any treatment or separation, in an open-air dumpsite.<sup>3</sup> This is *de facto* the prevailing traditional landfill and burning system across the archipelago. For this reason islands like Faafu Magoodhoo are illustrative examples to discuss the applicability of the National Waste Management Policy at local scale.

In 2009, the Island Council<sup>4</sup> built an area dedicated to items (in particular glass, plastic and cans) collection and treatment, a few meters from the place where the open-air dumpsite was located.<sup>5</sup> In 2012, they built an onsite incinerator, close to the dumpsite, to limit the environmental impact generated by open-air burning and landfill on the tropical ecosystems.<sup>6</sup>

This action was planned in Magoodhoo and formally followed the guidelines Government set for the start up of an IWMC, as we explained in section 2. The objectives of this action were: to promote items segregation; to limit open-air burning practice; to minimize the waste landfill; and to reduce harmful substances into the lagoon.

As formally stated by the National Policy the project carried out in Magoodhoo combined a top-down infrastructural measure (the site for solid waste segregation and treatment and the onsite incinerator) with the aim of promoting local awareness about waste collection and treatment. The main task was to implement an hybrid waste management model: top-down infrastructures and local community involvement.

Nevertheless, after a couple of years, this project faced the most impacting difficulty connected to the National Waste Management Policy in peripheral islands. The IWMC reached “its capacity, due to a lack of an organized program for waste collection, island resident stop the delivery of waste to the center” (Peterson 2013, p.8), reactivating the traditional practices connected to landfill and dumpsite burning. That is what happened in Faafu Magoodhoo due to a lack of financial support for treatment of segregated wastes. In other words, when the site reached its full capacity, local residents went back to traditional systems generating a kind of “clash” between traditional practices and infrastructural measures (such as the site).

<sup>2</sup> An interesting case is represented by the Maldives Ari Atoll Solid Waste Management Project, the Government and the World Bank have been carrying out in three islands in Ari Atoll: Ukulhas, Dhangethi, Dhigurah (available from: <http://www.worldbank.org/projects/P130163/maldives-ari-atoll-solid-waste-management-project?lang=en>).

<sup>3</sup> Once in a year metals and glasses are shipped to Thilafushi or Malé.

<sup>4</sup> It was an Action financed by UNDP (*GEF Small Grants Programme*).

<sup>5</sup> On the external hedge of the atoll near to the fringing reef.

<sup>6</sup> The incinerator's commissioning is planned for the beginning of 2015.



Figure 2. Map of the Maldives, Map No. 4479, February 2012  
Source: United Nation, 2012, <http://www.un.org/Depts/Cartographic/>

### The MaHRE Center in Faaf Magoodhoo

The University of Milano-Bicocca's Marine Research and Higher Education Center, was inaugurated in January 2009. The start-up was the result of a joint project carried out by the National Government of the Republic of the Maldives, the University of Milano-Bicocca, the City of Milan, the Italian Ministry of University and Research in Italy and EXPO2015. The MaRHE is housed in a former government building that has worked as regional government in the island of the atoll of Faafu Magoodhoo. The MaRHE is located North of the village and consists of four pagodas that can accommodate 30 people hosting the work of a dozen researchers. The MaRHE is both a center for research and training. The main scientific mission of the center covers marine science and, specifically, the ecology of coral reef environments, with a focus on stress factors that most impact the tropical reefs health. Moreover, the MaRHE also deals with political and environmental geography issues. Together with the important research marine biology pole,<sup>7</sup> we have been carried out a pilot study on the social response to change in relation to waste management (*The Right Place Project*) and energy production.

### The Right Place Project: a participatory action

#### Introduction

The implementation of the IWMC in Faafu Magoodhoo showed how complex can be promoting and developing a joint interaction between top-down solutions and informal practices. This challenge is even more evident in the Maldives because traditionally the system of waste collection is managed collectively and it is strongly linked to the collective use and care of public spaces. The group in charged of managing solid waste collection and disposal, usually, has the responsibility of caring and cleaning public sites and places. For these reasons, planning and starting up infrastructural measures, such as IWNC, does not automatically act on those knowledge and traditional practices that local communities used to adopt.

Considering this evidence, the MaRHE Center has carried out *The Right Place Project*, a research action which, instead of adopting a top-down approach, acted directly on local practices and on the relation between waste management and public space care. We referred to a theoretical framework inspired by a broad body of researches and actions (Mohan & Stokke 2000; Cornwall 2003; Buckingham, Reeves & Batchelor 2005; Mongkolnchaiarunya 2005; Pardasani 2006; Razee 2006; Savan, Flicker, Kolenda & Mildenberger 2009; Troschinetz & Mihelcic 2009; Piccolella 2013). *The Right Place* followed the methodological framework, deeply discussed in international literature, called "Participatory Rural Appraisal" (Chambers 1994a, 1994b). "Participatory Rural Appraisal (PRA) describes a growing family of approaches and methods to enable local people to share, enhance and analyze their knowledge of life and conditions, to plan and to act. PRA has sources in activist participatory research, agro-ecosystem analysis, applied anthropology, field research on farming systems" (Chambers 1994b, p. 953).

In this essay we discuss the preliminary findings emerging from the fieldwork. Our hypothesis was that the collective management of solid waste collection, disposal and burning, inside a Maldivian partially peripheral community, is strictly connected to public space perception, social structure (roles, intra and extra parental relationship, gender, age) and informal practices (such as public space care). Therefore, in order to positively connect, as declared by the National Waste Management Policy, infrastructural measures with residents' awareness, we started from the social and cultural strategies and knowledge that local communities have been developing to cope

with those environmental issues such as solid waste production and management.<sup>8</sup>

#### Methodological Framework

We focused our investigation mainly on women and young girls living in the village, according both to the general statement that collective response to environmental changes is deeply connected to the public roles people play within local communities and to the values of "environmental justice", linked to the idea of "climate justice" (Mary Robinson Foundation <http://www.mrfcj.org/>). Women are key actors both for the social structure of the island and for its economic balance, as they are formally in charge of pupils' education and of several cultural, economical and political issues, for instance the post-harvest phase in fisheries, household management and public ceremonies organization. At the same time, according to the Gender Advocacy Working Group of the United Nation Population Found (<http://www.unfpa.org/gender/>), Maldives are lagging behind in achieving third Millennium Development Goals specifically related to gender equality and women's empowerment. For instance, considering gender equality, in several local contexts, women have to face an increasing number of both domestic and public violence episodes, while focusing on women's empowerment, women can be considered the most vulnerable members of local communities, since jobs implying mobility feature a strong gender polarization that more often privileges men.

Given this context, the project aimed at involving the female population of Magoodhoo in two actions: waste management planning and public awareness promotion. In order to develop these two specific actions with the local community, we decided to operate holistically on four major and co-dependent "intervention areas" (I.A.):

- I.A n.1. Research.
- I.A n.2. Awareness.
- I.A n. 3. Gender Empowerment.
- I.A n. 4. Dissemination, above all at political level.

The factual objectives of these actions were: understanding the social, economical and cultural role played by women towards local and global environmental changes; appraising the role of the informal practices connected to waste management and public care; building a small-scale waste process and recycling facility run by women for community's profit, and presenting this project to all the citizenship.

In considering the social, cultural and environmental features defining a small village like Faafu Magoodhoo, we adopted a multi-layered approach. Referring to the "grounded theory" methodology, we used a set of qualitative methods (except in I.A. n. 4) comprising: participant observation, questionnaires, focus groups, semi-structured interviews, mental maps interpretation and action research activities (I.A n. 3).

#### Actions

In October 2012, we started a pilot study upon women's view on cultural and social transformations connected to the impact of exogenous forces. We adopted a methodological framework that elicited women's perception of social, cultural and environmental changes aiming at: discussing women's role in local response to change; collecting private and public experiences of the environmental change; interpreting women's sense of place; and pointing out informal practices. This first phase showed that the most vulnerable part of the community, women living in the island, perceive and describe the environmental changes the community is facing on, using their own experiences related to public life, to

<sup>7</sup> Tropical Biology is the main task of the research activities of MaRHE (Montano et al. 2012, 2013).

<sup>8</sup> Recently two interesting pilot projects of community based waste management have been promoted in Rinbudhoo and Thaa Madifushi.

the care and social function of public places or even to the habits regarding items production and reuse.

In March 2013 we delivered 106 questionnaires to male and female population living in Faafu Magoodhoo. Likewise, this survey worked also as an evaluation of the existing waste management project (financed by UNDP GEF Small Grants Programme). The preliminary analysis of the findings showed that women play a focal role in the domestic waste management, this outcome encouraged our interest in women-focused action. The survey pointed out that already existing private, parental and public practices are connected to recycling (such as plastic and cans). These items, while in a IWMC are often shipped, in the traditional system they are reused for domestic purposes or transformed by the community. Products (such as nappies, asbestos and food packaging) introduced by the recent transformations due to exogenous processes are perceived as most dangerous waste. Another interesting outcome regards the clash between the infrastructural and logistical system introduced by IWMC and the traditional knowledge shared by women.

In the third phase of the study, we have conducted a set of workshops with a group of ten women selected from among those who had been involved in the first part of the research. From October 2013 to February 2014 these women have formed a working group which aimed at identifying the practices related to public space care and proposing a rationalization of waste cycle able to minimize landfill and dumping; and to decrease the amount of waste burned. During these workshops we have followed the methodological structured already mentioned: mental maps, fieldwork activities and walk-transects.

The final product of these workshops was a draft of a project of solid waste collective management and reduction of dangerous wastes. This draft was presented by the group of women during a public exhibition organized in the presence of all the citizenship and it was finally delivered to the Island Council as a planning proposal. Women proposed a collective system, coming from the encounter among traditional practices and new levels of technical awareness, which potentially can be integrated with the principle introduced by the IWMC model.

#### Infrastructural measures vs informal practices?

This paper is based on the understanding of the clash often generated by the coexistence of infrastructure measures and informal practices in local systems such as small-size islands. This discussion refers to the interpretative framework applicable to the dialectic between top-down and bottom-up approaches. We did not aim at discussing this dialectic rather our focus was on the critical understanding of those outcomes emerging from the work with the group of women involved in *The Right Place Project*.

#### References

- van Alphen, K, van Sark, WG & Hekkert MP 2007, 'Renewable energy technologies in the Maldives – determining the potential', *Renewable and Sustainable Energy Reviews*, vol. 11, pp.1650–1674.
- Baldacchino, G 2004, 'The Coming of Age of Island Studies', *Tijdschrift voor Economische en Sociale Geographie*, vol. 95, no. 3, pp. 272–283.
- Briguglio, L 1995, 'Small Island Developing States and their economic vulnerabilities', *World Development*, pp. 1615–1632.
- Buckingham, S, Reeves D & Batchelor, A 2005, 'Wasting women: The environmental justice of including women in municipal waste management', *Local Environment: The International Journal of Justice and Sustainability*, vol. 10, no. 4, pp. 427–444.
- Chambers, R 1994a, 'Participatory Rural Appraisal (PRA): Challenges, Potentials and Paradigm', *World Development*, vol. 22, no. 10, pp. 1437–1454.
- Chambers, R 1994b, 'The origins and practice of participatory rural appraisal', *World Development*, vol. 22, no. 7, pp. 953–969.
- Colombo, A, Bettinetti, R, Strona, G, Cambria, F, Fanelli, R, Zubair, Z & Galli, P 2014, 'Maldives: An archipelago that burns. A first survey of PCDD/Fs and DL-PCBs from human activities', *Science of the Total Environment*, pp. 499–507
- Cornwall, A 2003 'Whose Voices? Whose Choices? Reflections on Gender and Participatory Development', *World Development*, vol. 31, no. 8, pp. 1325–1342.
- Department of National Planning 2010, *The Act on Decentralization of the Administrative Divisions of the*

Within a number of Maldivian islands there is a Women Development Committee (WDC), composed by women elected by all the inhabitants of the island. The WDC comes from an ancient tradition (Maloney 2012) and it has been institutionalized during the last decades. This institution is responsible for the collective uses of public spaces, in terms of care, collective management and organization of events or celebrations. It plays a relevant role within the local communities because it represents the part of the citizens more involved in the management of environmental and social issues: such as the cleaning of the beaches and paths or the solid waste collection. The Right Place project pointed out how women can benefit from this formal role and how they can be viewed as drivers for the implementation or more sustainable strategies. In this sense, we can note that a set of reports and documents recently published by the Central Government, we quoted for instance the *Fourth Tourism Masterplan 2013-2017* (Ministry of Tourism Art and Culture 2012), insist on gender empowerment as a strategy for local development. Our work did not aim at stressing this relationship but as previously clarified The Right Place, the main task was to understand the clash between informal practices and top down political intervention within local contexts as Faafu Magoodhoo. The Right Place stressed the significance of informal practices in terms of knowledge, and sense of place traditionally held by local communities. In fact working on the representation of places, the perception of change and the use of public spaces rather than call the usefulness of the IWMC Faafu Magoodhoo in question, emphasized the existence of a body of socio-environmental strategies describing Maldivian local communities as resilient systems. Therefore more than adopting vulnerability and mitigation as interpretative framework we should act on integrating traditional practices and knowledge with local and supra-local policies as strategies of social and environmental resilience. In human geography scale often helps to validate the pertinence of the outcomes emerging from fieldwork. In the first paragraphs we pointed out the priority of waste management and energy production and distribution as key environmental issues for islands countries. We did not mean to deny the relevance of global challenges, such as climate change, but we aimed at stressing the significance of the local scale to understand the socio-environmental relationship of communities living in small island states. In the same way we conclude this paper by confirming the existence of a dialectic between regional (or national) top down approaches (such as IWMC) and local knowledge and practices. This in not to devalue the fundamental function played by infrastructural measures and national regulations and plans, but to highlight how human geography of local communities is strongly connected to the strategies and adjustments they have developed to deal with environmental, social and political challenges.

- Maldives. Available from: <<http://www.planning.gov.mv/en/>>. [03.05.2014].
- Depraetere, C 2008a, 'The Challenge of Nissology: A Global Outlook on the World Archipelago. Part I: Scene Setting the World Archipelago', *Island Studies Journal*, vol. 3, no. 1, pp. 3–16.
- Depraetere, C 2008b, 'The Challenge of Nissology: A Global Outlook on the World Archipelago. Part II: The Global and Scientific Vocation of Nissology', *Island Studies Journal*, vol. 3, no. 1, pp. 17–36.
- Environment Research Centre 2008a, *National Solid Waste Management Policy for the Republic of Maldives*, Ministry of Environment, Energy and Water, Malé.
- Environment Research Centre 2008b, *Environmental and Social Assessment Framework, Maldives Environmental Management Project*, Ministry of Environment, Energy and Water, Malé.
- Gay, J.C 2014, 'Le Réchauffement Climatique: l'instrumentalisation des Iles', *L'Espace Géographique*, vol. 1, pp. 81–89.
- Gender Advocacy Working Group of the United Nation Population Found. Available from: <<http://www.unfpa.org/gender/>>. [05.12.2013].
- Gössling, S & Schumacher, K.P 2010, 'Implementing carbon neutral destination policies: issues from the Seychelles', *Journal of Sustainable Tourism*, vol. 18, no. 3, pp. 377–391.
- Jędrusik, M 2011, 'Island Studies. Island Geography. But What is an Island?', *Miscellanea Geographica – Regional Studies on Development*, vol. 15, pp. 201–212.
- Jędrusik, M 2014, 'The elusive sustainable development of small tropical islands', *Miscellanea Geographica – Regional Studies on Development*, vol. 18, no. 3, pp. 26–30.
- Kaly, U.L, Pratt, C.R & Howorth, R 2002, *Towards Managing Environmental Vulnerability in Small Island Developing States (SIDS)*. SOPAC Miscellaneous Report 461.
- Kelman, I 2010, 'Hearing local voices from Small Island Developing States for climate change, Local Environment' *The International Journal of Justice and Sustainability*, vol. 15, no. 7, pp. 605–619.
- Malatesta, S, Schmidt di Friedberg, M, Squarcina, E, Cajiao, M.A & Di Pietro A 2014, 'Stato centrale e centri periferici: la geografia politica delle Maldive tra omologazione e segregazione', *Scripta Nova*, vol. XVIII, no. 493.
- Maloney, C 1976, 'The Maldives: New Stresses in an Old Nation', *Asian Survey*, vol. 16, no. 7, pp. 654–671.
- Maloney, C 2012, *People of the Maldive Island*, Orient Blackswan, New Delhi.
- Mary Robinson Foundation. Available from: <<http://www.mrfcj.org/>>. [30.10.2012].
- Ministry of Housing, Transport and Environment 2010, *A Framework for Community Engagement in the Operation and Maintenance of Infrastructure*, Ministry of Housing, Transport and Environment, Malé.
- Ministry of Housing, Transport and Environment 2010, *Developing a User Pays Framework for Island Waste Management Service*, Ministry of Housing, Transport and Environment, Malé.
- Ministry of Tourism Art and Culture 2012, *Fourth Tourism Master Plan 2013–2017. Volume: Background and Analysis*. Available from: <<http://www.tourism.gov.mv/downloads/>>. [20.02.2014].
- Mohan, G & Stokke, K 2000, 'Participatory development and empowerment: the dangers of localism', *Third World Quarterly*, vol. 21, no. 2, pp. 247–268.
- Mongkolchaiarunya, J 2005, 'Promoting a community-based solid-waste management initiative in Local government: Yala municipality, Thailand', *Habitat International*, vol. 29, pp. 27–40.
- Montano, S, Strona, G, Seveso, D & Galli, P 2012, 'First report of coral diseases in the Republic of Maldives', *Diseases of Aquatic Organisms*, vol. 101, pp. 159–165.
- Montano, S, Strona, G, Seveso, D & Galli, P 2013, 'Prevalence, host range, and spatial distribution of black band disease in the Maldivian Archipelago', *Diseases of Aquatic Organisms*, vol. 105, pp. 65–74.
- National Bureau of Statistic 2014, *Population and Housing Census 2014, Preliminary Results*, Ministry of Finance & Treasury, Male'.
- Pardasani, M 2006, 'Tsunami reconstruction and redevelopment in the Maldives A case study of community participation and social action', *Disaster Prevention and Management*, vol. 15, no. 1, pp. 79–91.
- Peterson, C 2013, *Assessment of Solid Waste Management Practices and Its Vulnerability to Climate Risks in Maldives Tourism Sector*, Report submitted to Ministry of Tourism, Arts and Culture, July 2013, Malé.
- Piccolella, A 2013, 'Participatory mapping for adaptation to climate change: the case of Boe Boe, Solomon Islands'. *Knowledge Management for Development Journal*, vol. 9, no. 1, pp. 24–36.
- Razee, H 2006, *Being a Good Woman: Suffering and Distress through the voices of women in the Maldives*. Degree Thesis, University of New South Wales, Sydney.
- Romero Frias, X 1999, *The Maldive Islanders: The Maldive Islanders, A Study of the popular Culture of an Ancient Ocean Kingdom*, Nova Ethnographia, Barcelona.
- Roper, T 2005, 'Small Island States – Setting an Example on Green Energy Use', *RECIEL*, vol. 14, no. 2, pp. 108–116.
- Savan, B, Flicker, S, Kolenda, B & Mildenerger M 2009, 'How to facilitate (or discourage) community-based research: recommendations based on a Canadian survey', *Local Environment: The International Journal of Justice and Sustainability*, vol. 14, no. 8, pp. 783–796.
- Scheyvens, R & Momsen, J 2008, 'Tourism in Small Island States: From Vulnerability to Strengths', *Journal of Sustainable Tourism*, vol. 16, no. 5, 491–510.
- SIDSNet. Available from: <<http://www.sidsnet.org/>>. [30.10.2014].
- SPREP & UNEP 1999, *Guidelines for Municipal Solid Waste Management Planning in Small Island Developing States in the Pacific Region*, SPREP, Apia Samoa.
- Taglioni, F 2011, 'Insularity, Political Status and Small Insular Spaces: a Critical Review'. *The International Journal of Research into Island Cultures*, vol. 5, no. 2, p. 45–67.
- Trablesi, M 2005 *L'insularité*. Presses Universitaires Blaise Pascal, Limoges.
- Troschinetz, A.M & Mihelcic J.R 2009, 'Sustainable recycling of municipal solid waste in developing countries', *Waste Management*, vol. 29, pp. 915–923.
- UN 1994, *Programme of Action for Sustainable Development of Small Island Developing States*, United Nations, New York.
- UN 2012, *Maldives, Map No. 4479, February 2012*, Available from: <<http://www.un.org/Depts/Cartographic/>>. [23.02.2015].
- UNDP 2010, *Assessment of Development Results. Evaluation of UNDP Contribution*, UNDP, New York.
- UNEP 1999, *Waste Management in Small Island Developing States*, Commission on Sustainable Development, Seventh Session, 19–30 April 1999.
- United Nations Department of Economic and Social Affairs. Available from: <<http://www.un.org/en/development/desa/index.html>>. [25.02.2014].
- World Bank. Available from: <<http://www.worldbank.org/projects/P130163/maldives-ari-atoll-solid-waste-management-project?lang=en>>. [05.12.2013].