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**Coping with inherent vulnerabilities and building resilience
in small islands**

Socioeconomic and governance perspectives

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Coping with inherent vulnerabilities and building resilience in small islands
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Gérer les vulnérabilités inhérentes et développer la résilience des petites îles
Perspectives socioéconomique et de gouvernance

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ABSTRACT

The present paper focuses on the inherent natural and man-made vulnerabilities of small islands, and their opportunities to build resilience to hazards. More specifically, the socioeconomic and governance determinants are studied by analyzing two distinct main contexts, i.e. (i) Subnational Island Jurisdictions and (ii) small island states. Two different working hypotheses are explored. The first states that a higher level of governance autonomy better ensures the development of resilience, whilst the second states that a lower level of economic dependence to external polities increases the resilience.

As for the first hypothesis, the surveyed cases showed that the level of resilience does not appear to be a function of the level of autonomy of the local governance. SNIJs may rely on different approaches for taking advantage from their central governments that provide them with a statutory regime of 'national' protection and assistance. In some cases, they can also rely on paradiplomacy in order to ensure assistance from foreign countries with which they may sign memorandums of understanding for economic partnerships, and reciprocal assistance in emergency and disaster circumstances. On the other hand, small island states have all the authority to establish intergovernmental partnerships in order to increase their resilience to natural and man-made hazards. In all cases, the quality of governance in terms of competence and transparency prove to be key factors in reducing natural and man-made vulnerabilities, and therefore increasing community resilience.

Economic dependence is an inherent characteristic of small islands because of their extremely open economies. Economic dependence will therefore always be an inherent source of vulnerability for small islands. However, sound policies and competent financial management are key factors in building economic resilience, which creates the preconditions for a more comprehensive resilience (social, economic and environmental) of small island communities. Moreover, developing a strong economy through the establishment of solid partnerships with external polities, regardless the level of economic dependence that this implies, increases the opportunity of gaining external assistance from those partners with whom strategic economic interests are shared.

In conclusion, this study is an overview of elements that must be taken into account in emergency and disaster management in small islands in order to mitigate vulnerabilities they are exposed to. It is therefore a reminder of the link between hazard mitigation strategies intended to develop community resilience, and the principles of sustainable development.

RÉSUMÉ

Cette étude est un survol des divers types de vulnérabilité aux risques naturels et artificiels inhérents aux petites îles et des diverses opportunités de développer la résilience à ces risques. Plus spécifiquement, certains déterminants socioéconomiques et de gouvernance sont brièvement analysés dans le cadre de deux contextes d'autonomie politico-administrative : (i) les juridictions sous-nationales insulaires (JSNI) et (ii) les petits états insulaires. Deux hypothèses de travail sont explorées. La première statue qu'un plus haut niveau d'autonomie confère davantage d'opportunités de développer la résilience aux risques, tandis que la deuxième statue qu'une moindre dépendance économique augmente cette résilience.

Quant à la première hypothèse, les cas étudiés montrent que la résilience n'est pas une fonction du niveau d'autonomie de gouvernance. En effet, les JSNI peuvent s'appuyer sur leurs gouvernements centraux respectifs qui ont une obligation morale et juridique de les protéger et assister en cas de besoin. Dans certains cas, les JSNI peuvent aussi recourir à la paradiplomatie en signant des ententes avec des États étrangers ayant pour objet un partenariat économique, ainsi que des relations d'assistance réciproque dans des circonstances de crises ou désastres majeurs. L'opportunité d'établir des partenariats internationaux fait évidemment partie des prérogatives des petits états insulaires. Dans tous les cas, la qualité de la gouvernance, sur le plan des compétences et de la transparence, est un facteur essentiel pour réduire les vulnérabilités et donc pour développer la résilience des communautés.

En ce qui concerne la dépendance économique, il s'agit d'une caractéristique inhérente aux milieux insulaires, et ce, indépendamment de leur niveau d'autonomie de gouvernance. Elle ne peut donc pas être réduite, mais plutôt gérée par le biais de politiques appropriées et de bonnes capacités de gestion financière pouvant favoriser la résilience économique des milieux insulaires. À son tour, cette dernière crée les conditions favorables, mais pas suffisantes, pour une résilience étendue à d'autres domaines (social et environnemental). Un autre élément qui semble ressortir est le fait qu'une économie locale forte, fondée sur des capacités de gestion crédibles, est un élément essentiel pour créer des opportunités de partenariat avec des acteurs externes avec qui les milieux insulaires partagent des intérêts économiques.

En conclusion, cette étude s'insère dans une perspective de gestion des urgences et des catastrophes dont la portée et les effets sont une fonction des capacités des communautés à développer de la résilience aux risques naturels et artificiels auxquelles elles sont exposées. De là le lien entre, d'une part, les stratégies de mitigation des risques (développement de la résilience) et, d'autre part, des principes de développement durable.

1 INTRODUCTION

Islands host approximately 10 % of the world's population and cover about 7 % of earth's land surface (Baldacchino, 2007). Although the heterogeneous nature and fictive conceptual distinction from continents makes islands elusive to any Cartesian definition, they are conventionally defined as "areas of land smaller than a continent and entirely surrounded by water" (Encyclopedia Britannica, 2013).

Islands greatly vary in size between the few square kilometers or less of an islet up to the largest island on Earth, i.e. 2,166,086-km² Greenland (CIA, 2013). Within this wide size-spectrum small islands are often sorted out as geopolitical entities with peculiar characteristics in terms of environmental features (e.g. biological diversity, natural resources scarcity), economic structure and social organization (Baldacchino & Greenwood, 1998; Fisher, 2012). In sociological studies, small islands are also referred as "specks of land large enough to support permanent residents, but small enough to render their inhabitants the permanent consciousness of being on an island" (Péron, 2004, cited by Baldacchino, 2007a, p. 42).

Regardless their definition, small islands are geopolitical entities with vulnerable ecology and economy that affect their level of resilience to disasters, which tends to be aggravated by climate change and global economic instability (Adrianto & Matsuda, 2004; Boruff & Cutter, 2007; CCS, MaCEC & SAC-Northern Quezon, 2011).

Because of their great environmental diversity and well-defined spatial boundaries, small islands might be considered as "natural laboratories" with controlled conditions that facilitate the comprehension of the dynamics leading to community resilience. This is an interesting feature *per se* when attempting to find generalizations in emergency and disaster management.

This paper will therefore focus on some fundamental questions pertinent to small maritime islands, e.g.: what are the main factors that make them more vulnerable than continental areas? What policies for sustainable hazard mitigation had been put in place in order to build community resilience and what generalizable policies can be highlighted from successful (or unsuccessful) implementations? Does the level of autonomy and the quality of governance influence the process of building small island resilience?

Through the analysis of two distinct polity typologies, i.e. (i) subnational island jurisdictions (SNIJs) and (ii) small island states, the two following working hypotheses will be explored:

H₁ – The higher the level of governance autonomy, the higher is the resilience of small islands to natural and man-based hazards.

H₂ – The higher the level of economic dependence to external regions, the lower is the resilience of small islands to natural and man-based hazards.

2 DEFINITIONS

2.1 Islands

Islands are here defined according to article 121 (1) of the UN Convention on the Law of the Sea, which defines them as “naturally formed areas of land, surrounded by water, which are above water at high tide” (UNCLOS, 1982). However, this definition may also apply to areas of land that are conventionally called “continents”. Therefore, by convention and on the basis of common sense, islands are considered areas of land that are “smaller” than the smaller continent, i.e. the 7.74-million-km² Australia (CIA, 2014). Thus, with approximately a quarter of Australia’s area, Greenland turns out to be the largest island on Earth with its 2.17 million km² (CIA, 2014). To this intuitive definition of “island” it might be useful adding the principle integrated in several policies of the European Union according to which islands connected to the continental mainland by artificial fixed links (i.e. bridges and tunnels) should not be regarded as islands (Hache, 2007). In this regard, it has been documented how fixed links are indeed important infrastructural determinants that have long-term blurring effects on insular economies and communities (Baldacchino, 2007b).

The land size is not only an intuitive criterion used for identifying, if not defining, an island. It is also a feature influences its ecology, economic structure, and social organization. These are reasons why there is a history of scholar studies that focused on “small islands”, often seen as “natural laboratories” (Baldacchino, 2007a). UNESCO (1991), on the basis of environmental determinants (i.e. underground water resources), defines **small islands** as geographical entities with a top areal limit of 2,000 km² and top width limit of 10 km. Nevertheless, it is worth noting that ‘small islands’ may be defined otherwise. For instance, based on political and economic determinants, Baldacchino & Greenwood (1998) employed a top areal limit of 13,000 km², which is almost the size of Puerto Rico (13,790 km²).

For the purpose of the present paper, Baldacchino & Greenwood’s (1998) areal limit of 13,000 km² is applied as the defining criterion of small islands.

2.2 Vulnerability and Resilience

Vulnerability is here defined as a “measure of the degree and type of exposure to risk generated by different societies in relation to hazards” (Cannon, 1993). Vulnerability also “refers to permanent (or quasi permanent) features over which a country can practically exercise no control and therefore cannot be attributed to bad governance” (Briguglio et al., 2006, p. 14). Vulnerability to hazards results from three main components (Wisner, 1993; Cannon, 1993): (i) livelihood vulnerability, referred as the ability to generate resources through substance activities (e.g. employment), (ii) self-protection, referred as the people’s exposure to hazards in their immediate and extended living environment, which also includes potentially harming socioeconomic and cultural factors, and (iii) social protection, referred as the regulatory and organizational realm, e.g. the quality of regulations on land use, presence and quality of public services, warning systems, health infrastructures, and building codes.

Resilience is here defined as a society’s “ability (i) to recover quickly from a shock (shock counteraction), (ii) to withstand the effect of the shock (shock absorption), and (iii) to avoid the shock altogether” (Briguglio et al., 2006, p. 14). Resilience refers then to a coping ability, i.e. to what a society can do in order to mitigate or exacerbate vulnerability. It therefore reflects the appropriateness of policy

measures and how man-made measures “nurture” resilience to vulnerabilities. Briguglio *et al.* (2006) identify five main domains associated with nurtured resilience to natural and man-made hazards:

- *Macroeconomic stability*, intended as the ability to withstand impacts of exogenous shocks, including natural phenomena, through appropriate policies;
- *Microeconomic market efficiency*, based on mechanisms allowing rapid adjustments of local markets to achieve equilibrium in case of economic shocks;
- *Good political governance*, which relates to all aspects of the quality of life of the affected population and to issues such as the rule of law and property rights;
- *Social development*, which is an essential component of economic resilience of societies;
- *Good environmental management*, to ensure the sustainable use of natural capital and build preparedness to natural hazards.

3 SMALL ISLANDS VULNERABILITY

3.1 International recognition

It is here worth noting how the UNEP’s Agenda 21 (UNEP, 1992) acknowledges the peculiar features of small islands, with particular attention to Small Island Developing States (SIDS):

Chapter 17.123: *Small island developing States, and islands supporting small communities are a special case both for environment and development. They are ecologically fragile and vulnerable. Their small size, limited resources, geographic dispersion and isolation from markets, place them at a disadvantage economically and prevent economies of scale. For small island developing States the ocean and coastal environment is of strategic importance and constitutes a valuable development resource.*

Chapter 17.124: *Their geographic isolation has resulted in their habitation of a comparatively large number of unique species of flora and fauna, giving them a very high share of global biodiversity. They also have rich and diverse cultures with special adaptations to island environments and knowledge of the sound management of island resources.*

Chapter 17.125: *Small island developing States have all the environmental problems and challenges of the coastal zone concentrated in a limited land area. They are considered extremely vulnerable to global warming and sea-level rise, with certain small low-lying islands facing the increasing threat of the loss of their entire national territories. Most tropical islands are also now experiencing the more immediate impacts of increasing frequency of cyclones, storms and hurricanes associated with climate change. These are causing major set-backs to their socio-economic development.*

Chapter 17.126: *Because small island development options are limited, there are special challenges to planning for and implementing sustainable development. Small island developing States will be constrained in meeting these challenges without the cooperation and assistance of the international community.*

Since the Agenda 21 was promulgated, climate change continued its evolution and the situation of small islands continued to deteriorate (IPCC, 2013).

The following sections are a brief survey of the different types of inherent vulnerabilities that small islands, either subnational jurisdictions or island states, have to face. A discussion on some specific cases

will follow in order to provide examples of how vulnerabilities may be managed for increasing islands resilience, particularly in the realms of socioeconomic development and governance.

3.2 Physical vulnerability

Although extremely diverse in their individual features, small islands share many similar peculiarities that reflect their vulnerability to climate change impacts, e.g. physical size, proneness to natural disasters, extreme openness of their economies and low adaptive capacity (Mimura *et al.*, 2007). Moreover, climate change will cause sea level rise at a projected average rate of 5 mm/year throughout the 21st century, which will pose significant challenges in terms of land management (e.g. land loss vs. infrastructure needs) and exposure to environmental risks (e.g. flooding, storm surges, high energy waves, and coastal erosion), particularly in low-lying islands that might not be able to adapt (IPCC, 2013).

There is also strong evidence that water resources in small islands will generally be negatively affected by climate change due to significant changes in rainfall rates, resulting in increased water stress for island communities. For instance, simulations on climate evolution, as well as measured trends, show that some Pacific islands, e.g. Tarawa, Kiribati, will experience a 10 % rainfall reduction that will cause a 20 % reduction in the freshwater lens (Mimura *et al.*, 2007). Furthermore, rainfall changes will adversely affect some human activities such as subsistence and commercial agriculture, with negative consequences on food security, particularly in inter-tropical islands (FAO, 2004).

Mid-latitude islands will also be affected by increasingly frequent extreme climatic events. For instance, the islands in the Gulf of St. Lawrence and off the coast of Newfoundland (Eastern Canada) will be exposed to impacts from increasingly frequent tropical, post-tropical and extra-tropical storms, resulting in damage to infrastructure and property due to storm-surge flooding, large waves, coastal erosion and sea ice accumulation (Mimura *et al.*, 2007).

Climate change will also have substantial impacts on natural resources that are vital to island economies and environmental health, i.e. fisheries, coral reefs and other marine-based resources. Impacts will also depend on the height of islands' land above sea level. In this regard, a study carried out by the World Bank (2000) on Small Island Developing States (SIDS) shows that high islands, such as Viti Levu (Fiji), may experience damages equivalent to 2-3 % of their national GDP, while low islands, such as Tarawa (Kiribati), may experience damages up to 17-18 % of their national GDP.

Islands are also exposed to natural hazards not directly related to climate changes. For instance, the limited size of small islands, together with what in many cases correspond to high population density, increases the vulnerability of numerous communities to natural disasters (Boruff & Cutter, 2007). Small island States are particularly exposed to this type of vulnerability as they have little or no possibility to relocate affected populations within their national territorial jurisdictions, whereas the whole population and territory might be affected. This was the case for Maldives in the 2005 tsunami (Republic of Maldives, 2005).

3.3 Socioeconomic vulnerability

Small island states have peculiar economic characteristics that have been well documented by several seminal studies (Briguglio & Kisanga, 2004; Briguglio *et al.*, 2006). Their small economies expose them to external shocks related to the global or regional economy as well as to natural disasters that can heavily

affect their principal economic activities, which are most often tourism and fisheries. Briguglio & Kisanga (2004, p. 44) argue that the resulting economic vulnerability stems from high degrees of three main features. Firstly, economic openness, measured as the ratio of international trade to GDP, makes small island states susceptible to external economic conditions on which they have very little or no controlling leverage. Secondly, exposure to external shocks is enhanced by export concentration, which reflects the small range of exported goods and the low economic diversification of small island states. Thirdly, the dependence on strategic imports, measured as the ratio of energy and goods imports to total GDP, is a consequence of the scarcity of natural resources and raw materials.

Several studies focused on how peripherality, i.e. islands remoteness and isolation, also causes (i) high per unit transport costs, (ii) uncertainty of supply, and (iii) need for keeping large quantities of stock with high inventory costs, (iv) limitations to economies of scale, and (v) reduced domestic competition (CPMR, 2002; Ghina, 2003). All these factors affect islands' economic competitiveness and make them more vulnerable to external shocks if compared to 'continental countries' (Baldacchino & Greenwood, 1998).

Most inhabited islands, regardless their level of governance autonomy and particularly those located at great distances from the mainland are highly dependent on oil and gas supply for energy production employed for both, transportation and electricity production. The expenditures resulting from importing non-renewable energy sources as an alternative to developing energy efficiency practices and using renewable sources of energy represent a substantial opportunity cost and a public financial burden for islands that prevent them to invest on activities that could otherwise diminish their vulnerability to natural and man-made hazards (Ronnenberg, 2004).

Waste management also represents a major issue for islands because of their limited land endowment for suitable landfill sites (Ronnenberg, 2004). The population smallness also inhibits investments in relatively expensive waste treatment technologies, sometimes making waste exportation the sole, yet costly, alternative. Therefore, waste disposal costs typically absorb substantial portions of the small island public financial resources, once again draining incomes from needed investments in sectors that would otherwise reduce vulnerability to natural and man-made hazards.

4 BUILDING RESILIENCE: OPPORTUNITIES FOR SMALL ISLANDS

The level of governance autonomy influences the opportunities and endogenous capacity to develop resilience against hazards, whether of natural or man-made origin (Baldacchino & Milne, 2000). In this regard, two main situations are here considered, i.e.: (i) sub-national island jurisdictions (SNIJs), which may have a status ranging from sub-municipal communities up to region or state within a confederation (e.g. Iles-de-la-Madeleine, Shetlands, Faroe Islands, Saint Helena, Azores, Reunion, Zanzibar, Easter Island, and Falkland/Malvinas), and (ii) small island sovereign states (e.g. Malta, Tuvalu, Vanuatu, Nauru, Bahamas, Barbados, and Singapore).

4.1 Sub-National Island Jurisdictions (SNIJs)

Considering that emergency and disaster management is generally a centralized function of national governments, determining responsibilities for local SNIJs local governments may be complex and not always straightforward, particularly in those cases where the national capital is very far apart, as in the case of France's and UK's oversea territories. In this regard, according to Kelman *et al.* (2006), there are

five possible alternatives for SNIJs to manage disaster: (1) do nothing, (2) focus on improving the state's action, (3) focus on improving the SNIJs local capabilities, (4) pursue full sovereignty or more autonomy from the state, and (5) focus on dealing directly with international organizations and government (paradiplomacy).

Those islands that achieved sovereignty had chosen the fourth option, which will be discussed in section 4.2. Options 3 and 5 will here be discussed with a particular attention to the role of paradiplomacy, which represents a sort of 'grey area' where it is not always clear what a sub-national jurisdiction can do in representing itself to the outside world. This issue will be explored while employing the perspective of three legal regimes of SNIJs within the Commonwealth states, i.e. constitutions, legislation, and inter-supra-governmental organizations. Paradiplomacy becomes particularly relevant as a tool to deal with pre-disaster and disaster activities when the SNIJ state's capital and mainland are so far apart that mobilizing resources for assistance, recovery and reconstruction becomes much more difficult than requesting assistance to geographically closer foreign countries.

4.1.1 Constitutions

Only four constitutions of Commonwealth states suggest connections between sub-national jurisdictions and disaster-related activities (Kelman *et al.*, 2006). The first case is one of a country that does not have any SNIJ, i.e. South Africa. The second case, Papua New Guinea, provides the National Executive Council the authority to suspend a provincial or local government (including those of its SINJs) in the occurrence of a disaster. This preempts all subnational paradiplomacy as a consequence of a strong centralization of authority. The third case, Solomon Islands, acknowledges the role of traditional chiefs in the provinces (constituted of SNIJs), suggesting the possibility for chief-based disaster-related SNIJs roles. The fourth case, St Kitts and Nevis, provides the island of Nevis with the responsibility and power of declaring the state of emergency, although there is no mention about its prerogative of requesting international assistance.

As Kelman *et al.* (2006) argue, (i) constitutions are not deemed to cover disaster-related activities, and (ii) emergency is typically not an area of jurisdiction for purposes of constitutional division of powers. This may explain why state constitutions so rarely mention disaster-related activities. However, even if no state constitution clearly forbids a subnational-jurisdiction from undertaking disaster paradiplomacy, emergencies are always referred as *national* emergencies, implying that they are a prerogative of the national government.

On the other hand, some UK's island oversea territories (OT), such as Anguilla, Bermuda, Cayman Islands, Montserrat and Turks and Caicos Islands, are provided with their own constitutions, which actually mention emergency procedures, but not specifically disaster-related activities (Kelman *et al.*, 2006). External activities, intended as international activities, are a clear prerogative of the 'homeland' British government, which theoretically precludes OT paradiplomacy.

4.1.2 Legislation

Disaster-related SNIJ legislation (beyond constitutions) generally refers to national plans that permit requesting and obtaining assistance from the national government. Rare are provisions to call for international assistance (Kelman *et al.*, 2006). One of those is the case of the two island (or mainly island) provinces of Eastern Canada, i.e. Newfoundland and Labrador and Prince Edward Island, which in

2000 signed a Memorandum of Understanding (MOU) along with New England's states (Maine, New Hampshire, Connecticut, Massachusetts, Rhode Island, Vermont) and other Eastern Canadian provinces, i.e. Nova Scotia, New Brunswick and Quebec (IEMG, 2013). This MOU is intended to ensure mutual assistance in cases where single parties are not able to handle emergency and disaster situations. Emergency-related training and assistance may be carried out across the US-Canada border without involvement from the national governments.

It is however important to underscore that Prince Edward Island does not really qualify to our definition of islands, because it is provided with a fixed link to the mainland (the Confederation Bridge). As for the insular component of the province of Newfoundland and Labrador (i.e. Newfoundland), it is actually a 'big' island (405,212 km²) with a size much greater than the stated limit for small islands. Both of these features, fixed links and large size, offer paradiplomacy opportunities that are relatively rare within SNIJs (Baldacchino, 2007b).

4.1.3 Inter- or supra-governmental organizations

Several cases of actual paradiplomacy with inter- or supra-governmental organizations may be acknowledged for some SNIJs, revealing a pragmatic approach that sometimes moves beyond legislation. For instance the Delegation of the European Union in Barbados and the Eastern Caribbean is empowered to deal directly with those UK SNIJs on some disaster-related activities including assistance in emergency situations. This was true in many cases, for instance (Kelman *et al.*, 2006): (i) the European Union financial aid of 2,543,000 Euros to Montserrat local government following the 1995 volcanic eruptions, (ii) the reconstruction funds to Anguilla following Hurricane Lenny in 1999, and (iii) the relief funding to Cayman Islands following Hurricane Ivan in 2004.

Another interesting case is the establishment of the Caribbean Disaster Emergency Response Agency (CDEMA, www.cdema.org), a regional inter-governmental organization the members of which are both, sovereign island states (e.g. Bahamas and Jamaica) and SNIJs. Among the latter four UK overseas territories and SNIJ's are reckoned, British Virgin Islands, Anguilla, Montserrat and Turks and Caicos Islands, whose local governments can deal directly with other CDEMA members for emergency assistance.

The Alliance of Small Island States (AOSIS, <http://aosis.org>) is another example of intergovernmental organization that includes SNIJs members. Its primary mission is to negotiate within the United Nations system on issues related to climate change that, as we have seen in the previous sections, will heavily impact islands. For SNIJs, AOSIS is a powerful tool to exercise paradiplomacy for the sake of their environmental challenges that will need to be faced in the forthcoming future.

4.1.4 Empowerment opportunities for effective resilience-building

An important distinction between government and governance should be emphasized here. The former refers to decision-making by elective – in the case of a democracy – representatives, as opposed to governance that refers to decision-making by a plurality of networked partnerships (Baldacchino, 2006). This distinction is particularly important for SNIJs that are located at great distances from the state's capital and from the government agencies responsible for the decision-making and policy development processes.

Paradiplomacy here becomes a strategy for surmounting what constitutional or other legislative frameworks may explicitly allow, and for building resilience to shocks through locally conceived and adaptive plans. In this regard, three main approaches may be considered (Baldacchino, 2006). The first consists in developing partnerships with inter- or supra-governmental organizations, as discussed in the previous sections. The second approach consists in using local resources (e.g. natural resources, tourism, strategic military bases...) as ‘bargaining chips’ to negotiate a higher level of governance autonomy and promote decentralized powers. The third approach is a more radical one, i.e. unilaterally embarking on a “rogue politics” mode by setting the island jurisdiction on a confrontational path with the central government, while leveraging on the local public opinion. This attitude would aim to carve out political weight and resources for the SNIJs from their central government.

In any of those cases, maintaining a non-sovereignty condition is not necessarily a neo-colonial servility, but rather represents for many SNIJs a way of increasing local communities resilience, while reducing government costs that would need to be faced if independence were to be achieved (Baldacchino, 2006). This is indeed the result of the obligation of central governments to provide different forms of assistance to the SNIJs under their sovereignty, regardless their geographic distance from the state’s capital.

4.2 Small Island States

As mentioned in section 2.2, a society’s ability to cope with different types of shocks relies on the ability to ‘nurture’ resilience to vulnerabilities. This may be achieved through efficient economic policies and practices, i.e. the capability to manage and mobilize extraordinary resources in emergency and disaster circumstances, as well as good governance, i.e. the necessary conditions to sustainably and efficiently run a polity, which are crucial for building resilience to hazards. In this regard, we shall discuss three specific cases showing an increasing level of nurtured resilience, i.e. Vanuatu, Seychelles and Singapore. These three states also represent a gradient of decreasing economic and human development, as well as decreasing levels of governance corruption (table 1). As it will be discussed later, wealth and governance integrity are key variables in the process of building resilience to shocks.

Table 1. Descriptive statistics for the three analyzed State islands. GDP: gross domestic product (USD); CPI: corruption perceptions index; HDI: human development index.

		Surface (km ²) ¹	Population (2012) ¹	GDP per capita (2012) ¹	Gini index (2012) ¹	CPI (ranking) (2011) ²	HDI (ranking) (2012) ³
1	Singapore	697	5 460 302	61 000	47,8	9,2 (5)	0,895 (18)
2	Seychelles	455	90 846	25 600	65,8	4,8 (50)	0,806 (46)
3	Vanuatu	12 189	261 565	5 000	(56-58)	3,5 (77)	0,626 (124)

¹ CIA (2013), ² Transparency International (2011), ³ UNDP (2013)

4.2.1 The case of Vanuatu (12,189 km², South Pacific)

After multiple waves of Pacific migrants of different cultures and languages, Vanuatu became an Anglo-French Condominium in the 19th century, and eventually achieved its independence in 1980. Its official population in 2012 was of 261,565, spread across four main islands and 80 smaller ones (CIA, 2013). Vanuatu is among the poorest countries in the world with a GDP per capita of 5,000 \$ in 2012, and trade mostly occurring with Australia and New Zealand (CIA, 2013).

As most islands, Vanuatu is highly affected by the openness of its economy, defined as high percentage of total exports and imports of goods and services to GDP. About 85 % of its GDP is indeed represented by imports and exports (Jayaraman, 2004). The high degree of exports concentration further compounds the risks emanating from this high dependency on external markets. Moreover, most of the exports are agricultural goods, mainly copra, beef and timber, which are at high risk of uprooting because of Vanuatu's exposure to frequent violent cyclones.

Different measures had been proposed to build resilience to these vulnerabilities (Jayaraman, 2004). Economic diversification is one of the foreseen remedies. Although this is always a slow process, it can be planned and achieved on the long term, likewise Fiji. Reinforcing the present agriculture-based economy with investments in the presently weak manufacturing sector may also be beneficial in terms of economical diversification and employment opportunities. Average wages may increase with positive social impacts by reducing livelihood vulnerability. The fiscal regime should also be thoroughly reviewed. Its historical inheritance of a tax heaven status makes Vanuatu's present fiscal regime inflexible and insufficient for developing highly needed public services. The necessity of finding alternative tax revenue had therefore become particularly pressing.

But good governance is probably the most desired factor, in a country that had been flawed by abuses of power and corruption of high-level public officials and politicians (Jayaraman, 2004). Transparency International (2013) reported a very low CPI for Vanuatu (table 1). No effective changes in terms of resilience building may be done until bad governance will take place and a small elite will have its hands on the country's main resources despite the generalized poverty of the population. Sound policies development and implementation aiming resilience building will be very difficult to put in place until this fundamental problem will not be solved (Jayaraman, 2004).

4.2.2 The case of Seychelles (455 km², Indian Ocean)

After a long-lasting struggle between France and Great Britain, Seychelles was ceded to the latter in 1814, and almost a century and half later became independent (1976). Its population in 2012 was of 90,846 citizens, spread across its 41 granitic and 75 coralline islands (CIA, 2013). Seychelles is a developing country with a GDP per capita of 25,600 \$ in 2012. It has an economy based on tourism (30 % of the labor force and 70 % of currency earnings) and fisheries. Its export partners are mostly European countries (>55 % of exports) and Japan (~15 % of exports) (CIA, 2013). The sector of fisheries is sustained by a local manufacturing industry for fish processing and export. Financial services and offshore development are also important sectors that were backed by the Central Bank of Seychelles (CBS). The latter also played a key role for the development of the national financial system as well as for infrastructure development (Larose, 2004). Some offshore activities started in the mid-1990s, thanks to the establishment of the Seychelles International Business Authority (SIBA) as a mean for diversifying the national economic base.

Seychelles, as most islands, is vulnerable to hazards related to climate changes, e.g. sea level raise, salinization of underground water, and possible desertification. However, given its position outside the cyclone belt, hazards associated to such extreme climatic events are of limited concern (CIA, 2013). Its economic vulnerability is high and related to external and internal risks typical of an open and small economy, with a high level of export concentration. External risks are mainly related to the following factors (Larose, 2004):

- Exchange rate risks – As the price of tourism and fisheries exports are fixed on the basis of international foreign exchange market, the countries' economy is vulnerable to external currency shocks;
- Interest rate risk – In order to meet its development costs, Seychelles needs to borrow money from external markets. Since financing is carried out mostly in US Dollars and the floating rate associated with the international market fluctuates according to the international markets, the financing costs are beyond the control of the national financial planners. An interest rates raise may therefore have a heavy impact on such a small economy and affect the country's risk profile and capacity to borrow money.
- Money laundering – Although the promotion of offshore activities may have positive effects on GDP and economy diversification, it also presents high risks of criminals using the jurisdiction as a base for illegal transactions and money laundering, with major disruptive effects on the financial sector and the country's reputation.
- Change in business cycles – Because the Seychelles' economy is strongly dependent on tourism from European countries, economic cycles in the latter may heavily affect tourism arrivals and foreign earnings. This would have a heavy impact on the GDP and the economy as a whole.

These vulnerabilities expose Seychelles to economic hazards that may heavily impair its ability to cope with natural hazards through the mobilization of resources for preparedness, mitigation, response and recovery to emergency and disaster situations (Larose, 2004). In this regard, Seychelles adopted a series of strategies that substantially improved its economic resilience, namely through sound financial management and policy measures put in place and conjointly managed by the Government of Seychelles and CBS (Larose, 2004). Measures include (i) exchange rate stability policies, including pegging the Seychelles Rupee to a basket of currencies, (ii) inflation control systems, (iii) a managed interest rate structure under CBS competent control, and (iv) liquidity requirements for banks. Measures ensuring good governance had also been put in place through (Larose, 2004): (i) compliance to the Basle Capital Accord, implying awareness of management accountability and transparency, as well as strengthening the financial system's competitiveness and resilience, (ii) policy transparent co-ordination between governmental agencies and CBS, and (iii) anti-laundering legislation. In this regard, Seychelles progressively improved its reputation, as showed by its CPI ranking (table 1).

As a result, of its success and international credibility Seychelles was able to gain financial support from the International Monetary Fund in 2009, that allow the country to face and buffer impacts from the 2008 international economic crisis (CIA, 2013). Seychelles is now attempting to further improve its economic resilience through a revision of its tax system and a reorganization of its state enterprises (CIA, 2013).

4.2.3 *The case of Singapore (697 km², Southeastern Asia)*

Founded as British trading colony in 1819, Singapore joined the Malaysian Federation in 1963 and became independent two years later. With its 63 islands, this city-state represents one of the most prosperous economies in the world with a GDP per capita of 61,000 \$ in 2012, and a multicultural population of 5,460,302 (CIA, 2013). It enjoys a highly developed and free-market economy, and a virtually corruption-free environment (CIA, 2013), being ranked as the fifth least corrupted country (Transparency International, 2012) (table 1).

Although income inequality across its society is relatively high as compared to most developed countries, the Gini index for Singapore (47.8, in 2012) (table 1) is similar to those of United States (45) and United Kingdom (40) (CIA, 2013). Its economy is highly diversified and includes sectors like electronics manufacturing, IT products, pharmaceuticals, and financial services. However, given its small domestic market, a very large portion of its products is exported.

Singapore's inherent vulnerability features are those common to most of ensure themselves assistancesmall islands, i.e. economic openness and a dearth of natural resources. It is almost totally dependent on fossil fuels for its energy needs, while more than half of its potable water is imported from Malaysia and about 90 % of its food is imported (Peebles & Wilson, 2004). Singapore is also highly dependent on foreign resources, particularly in terms of foreign investments and specialized labor, which represents at least 30 % of the working population. Moreover, its small economy prevents Singapore to have any leverage on the price determination of its exported goods (Peebles & Wilson, 2004). All these issues make Singapore vulnerable to external shocks.

Singapore faces these vulnerabilities with both, an inherent economic resilience and a policy-induced ('nurtured') resilience (Peebles & Wilson, 2004). The former is due to several factors. Firstly, its *location* along an important commercial seaway historically benefited to Singapore, and enabled it to develop a 'warehouse' trade and re-export economy. Singapore had also been advantaged from being geographically close to several of its commercial and political partners in Southeastern Asia. Government investment abroad since the mid-1980s has also endowed the country with a steady flow of income, which contributed to its balance of payments, and a low fiscal pressure. The latter allowed (i) maintaining a favorable environment for foreign investors, and (ii) keeping high-level public services (e.g. health system).

Policy-induced resilience includes (i) sound macroeconomic policies, which historically provided resilience to external and internal shocks, and (ii) successful initiatives aiming economic diversification (Peebles & Wilson, 2004). It is also important to re-emphasize how the historical fight against corruption had on creating an environment attractive to investors, which made possible the reduction of costs associated with criminal activities (e.g. money laundering), and bestowing Singapore a high credit from international rating agencies.

The high levels of economic resilience will most likely enable Singapore to face some environmental issues that represent vulnerabilities that are not discussed here, but that include industrial pollution, limited natural freshwater resources and limited land availability for waste disposal. It is however worth mentioning that the Government of Singapore considers building a desalinization plant for reducing dependence from Malaysia for freshwater and therefore increase resilience to the consequences of

regional political hazards (Peebles & Wilson, 2004). The possibility of mitigating freshwater supply problems is therefore possible thanks to its relative proximity to continental South Asia.

5 CONCLUSION

As discussed in the previous sections, small islands show particularly high levels of inherent vulnerabilities to natural and man-made hazards, compared to continental regions or islands large enough to ensure higher levels of inherent resilience. Inherent vulnerabilities results primarily from the scarcity of: (i) land, which represents a constraint for infrastructure development, waste disposal, and refuge options in case of natural disasters, (ii) natural resources (e.g. freshwater, endogenous sources of energy, raw materials), and (iii) exposure to natural hazards (e.g. cyclones). Moreover, the geographical distance from global or regional economic hubs often represents a substantial challenge for socio-economic development initiatives.

Man-made vulnerability mostly depends on governance, in terms of competence, quality and, to a lesser extent, level of autonomy. Socioeconomic sustainable development proves to be founded on good governance. The three cases of sovereign small islands here discussed, i.e. Vanuatu, Seychelles and Singapore, show how efforts deployed for fighting corruption, developing sound economic policies, and promoting good public management in the interest of the whole society are worth long-term investments and for increasing resilience to external shocks.

The level of governance autonomy is also an important factor in defining the opportunities to build resilience. For SNIJs, paradiplomacy may represent a useful approach for seeking efficient emergency and disaster assistance through non-governmental regional agencies. However, subnational islands may also enjoy advantages from keeping an “umbilical cord” to larger polities. The latter may indeed provide strategically important assistance through the provision of much more substantial resources than those that may be locally available. In the case of small islands states, economic and political alliances with other countries may also prove to be a winning strategy to build resilience. Nevertheless, the proximity to continental countries may also facilitate resilience building, such as in the case of Singapore, who can rely on secure freshwater supply from Malaysia, at least until the political relationship between the two countries remains peaceful and collaborative (which may be a rational deterrent for not doing so).

A comparison between Vanuatu, Seychelles and Singapore also shows how ‘investing’ in competent and sound financial planning ensures a sound and more resilient economy on the long run. This ultimately translates into a more educated, competent and empowered society that may develop higher resilience to vulnerabilities than societies that do not make this kind of social ‘investment’.

In conclusion, the surveyed cases disproved the initial hypotheses. Firstly, the economic dependence, it is an inherent characteristic of small islands because of their extremely open economies. Economic dependence will therefore always be an inherent source of vulnerability for small islands. However, sound policies and competent financial management are key factors in building economic resilience, which creates the preconditions for a more comprehensive resilience (social, economic and environmental) of small island communities. Moreover, developing a strong economy through the establishment of solid partnerships with external polities, regardless the level of economic dependence that this implies, increases the opportunity of gaining external assistance from those partners with whom strategic economic interests are shared.

Secondly, the level of resilience does not appear to be a function of the level of autonomy of the local governance. SNIJs may rely on different approaches for taking advantage from their central governments that provide them with a statutory regime of 'national' protection and assistance. In some cases, they can also rely on paradiplomacy in order to ensure themselves assistance from foreign countries with which they may sign memorandums of understanding for economic partnerships, and reciprocal assistance in emergency and disaster circumstances. On the other hand, small island States have all the authority to establish intergovernmental partnerships in order to increase their resilience to natural and man-made hazards. However, as we have already emphasized, the quality of governance is a primary condition to gain support and credibility on the international stage, which ultimately provides readiness to assistance in emergency and disaster circumstances. It is also worth mentioning that since the beginning of the 1990s Small Island Developing States (SIDS), while recognizing their inherent vulnerabilities, established a cooperation network that helped them to surmount isolation by: (i) assisting SIDS members in emergency/disaster situations, (ii) promoting economic cooperation, and (iii) lobbying their case within the United Nations on specific issues, such as climate change impacts and adaptations (SIDS network, <http://www.sidsnet.org/about-sids>).

Nonetheless, although these cooperative approaches are useful tools for regional development, they do not let root-problems disappear. In the forthcoming future, sea level rise will increasingly expose low-lying islands to flooding and eventually to permanent or quasi-permanent submersion that would make substantial portions of their territory unlivable, such as in Maldives, Tuvalu, Kiribati, Bahamas and many other cases, for which most of the land lays below 2 to 5 meters above present mean sea level. The majority and eventually the entire populations of these and other SIDS will be compelled to permanently leave their insular homeland within the 21st century. For instance, some scenarios suggest that Maldives may disappear within 2085 (Anthoff *et al.*, 2010). All this implies unprecedented social, economic and juridical problems at international scales, with straining implications at national and regional levels (Turvey, 2007; Baldacchino, 2010, p. 152-157). The paradigms of small island community resilience will then need to be reviewed in a very different light.

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