
Perspectives

A 'Healthy Islands' framework for climate change in the Pacific

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Summary

Small Pacific Island countries (PICs) are among the most vulnerable countries in the world to the anticipated detrimental health effects of climate change. The assessment of health vulnerabilities and planning adaptation strategies to minimize the impacts of climate change on health tests traditional health governance structures and depends on strong linkages and partnerships between actors involved in these vital processes. This article reviews the actors, processes and contexts of the climate change and health vulnerability assessment and adaptation planning project carried out by the World Health Organization and health sector partners in three island countries in the Micronesian region of the Pacific throughout 2010 and 2011: Federated States of Micronesia, Marshall Islands and Palau. Despite their shared history and cultural characteristics, the findings and implications of this article are considered to have substantial relevance and potential application to other PICs. The modified 'Healthy Islands' framework for climate change and health adaptation presented in this article draws upon real-world experience and governance theory from both the health and climate change literature and, for the first time, places health systems adaptation within the vision for 'Healthy Islands' in the Pacific region.

Key words: climate change, environment and public health, policy and implementation

INTRODUCTION

Anthropogenic climate change is a product of industrialization, economic development, population pressure and globalization that poses myriad risks to society, including detrimental impacts on human health. The health risks

posed by climate change are manifold and occur via complex pathways (McMichael, 2014).

These health effects are measurable, at least in part. The annual global mortality attributable to a small number of specific climate change-related burdens of disease in

the few decades prior to the year 2000 was estimated by the World Health Organization (WHO) to be in the order of 150 000 deaths per year (WHO, 2003). Recent WHO modelling suggests that, by the year 2030, the annual mortality due to climate change impacts on diarrhoeal disease, malaria, malnutrition and heat-related illness will have risen to ~250 000 per year (WHO, 2014a).

The evidence strongly suggests that the burden of disease due to climate change will also be unevenly and inequitably distributed, with a disproportionate burden falling on women and children; people living in poverty; those with pre-existing illnesses and communities in developing countries (WHO, 2003; Patz *et al.*, 2007; Friel *et al.*, 2008). PICs, in particular, may be considered the ‘canaries in the coalmine’ of climate change, due to their heightened vulnerability, which results from a combination of geographic, demographic and socio-economic factors (Hanna and McIver, 2015). Despite their negligible contributions towards global greenhouse gas emissions, PICs suffer the indignity of being among those countries first and hardest hit by the effects, including health impacts, of climate change: ‘. . . the unwanted gift from the developed world’ (Palau Ministry of Health and WHO, 2012).

Responding to the health impacts of climate change tests traditional governance structures, including (but not limited to): the trans-border, cross-cutting nature of the health risks involved; the relative paucity of formal engagement by the health sector in the initial stages of international and national climate change and health vulnerability assessment and adaptation planning work and the requirement to involve multiple sectors in implementing measures to protect health from climate change. Climate change thus resembles other aspects of globalization, such as increased travel and trade, in that it challenges existing health-protective systems and presses the need for a change in the fundamental nature of governance (Dodgson *et al.*, 2002).

This article explores a number of critical issues related to climate change and health governance. Analysed from the perspective of the health vulnerability assessment and adaptation planning project undertaken by WHO and health sector partners, we examine three small island developing states (SIDS) (SIDS were recognized as a distinct group of developing countries facing specific social, economic and environmental vulnerabilities at the United Nations Conference on Environment and Development (otherwise known as the Earth Summit) in Rio de Janeiro, Brazil, in 1992.) in the northern Micronesian region of the Pacific: the Federated States of Micronesia (FSM), Marshall Islands and Palau, as case studies for the wider community of PICs.

In doing so, a context-specific framework for climate change and health governance is posited, which places

climate change within the existing health systems development vision for ‘Healthy Islands’ in the Pacific region, first articulated by the Ministers of Health of the Pacific Islands in their 1995 meeting at Yanuca Island, Fiji, and subsequently hailed in this journal almost two decades ago as a ‘truly ecological model of health promotion’ (Nutbeam, 1996).

BACKGROUND

Marshall Islands, FSM and Palau are neighbouring Pacific SIDS stretching from east to west, just north of the equator. They are small countries in terms of population (2012 World Bank estimates place the population of FSM at 103 395, Marshall Islands at 52 555 and Palau at 20 754.) but, due to their limited land area, have some areas of relatively high population density. Such demographic and geographic factors (including the very low elevation of many of the region’s islands and atolls) contribute to making these among the countries most vulnerable to the physical effects of climate change which, in the Pacific region, are anticipated to include increasing air and sea-surface temperatures; altered rainfall patterns; increasing severity of extreme weather events such as tropical storms; ocean acidification and, of particular concern, rising sea levels (PCCSP, 2011).

In recognition of the health risks posed by climate change, WHO and member states in the Asia-Pacific region compiled a *Regional Framework for Action to Protect Human Health from Effects of Climate Change in the South East Asia and Pacific Region* in 2007 (WHO, 2007).

The health ministers in the Pacific region, at their biennial meeting in Papua New Guinea in 2009, responded with the *Madang Commitment*. This sought to operationalize the previous recommendations by laying out a series of strategies related to planning, coordination, implementation and health systems strengthening in the context of climate change and health adaptation in the Pacific (WHO and Secretariat for the Pacific Community, 2009). These strategies were loosely linked to the ‘Healthy Islands’ framework (Figure 1) (Galea *et al.*, 2000). This model was developed in the mid-late 1990s and encompasses, in the Pacific island context, the actors, context and processes involved in health systems development (Walt and Gilson, 1994).

The aforementioned policies may have been the first by the health sector to specifically address the health impacts of climate change in the region, but it is important to note that these issues had been considered in many PICs as part of their earlier work on climate change vulnerability and adaptation. As part of their initial and subsequent National Communications to the United Nations Framework Convention on Climate Change (UNFCCC) (submitted in the mid- to late-2000s), and via the compilation of

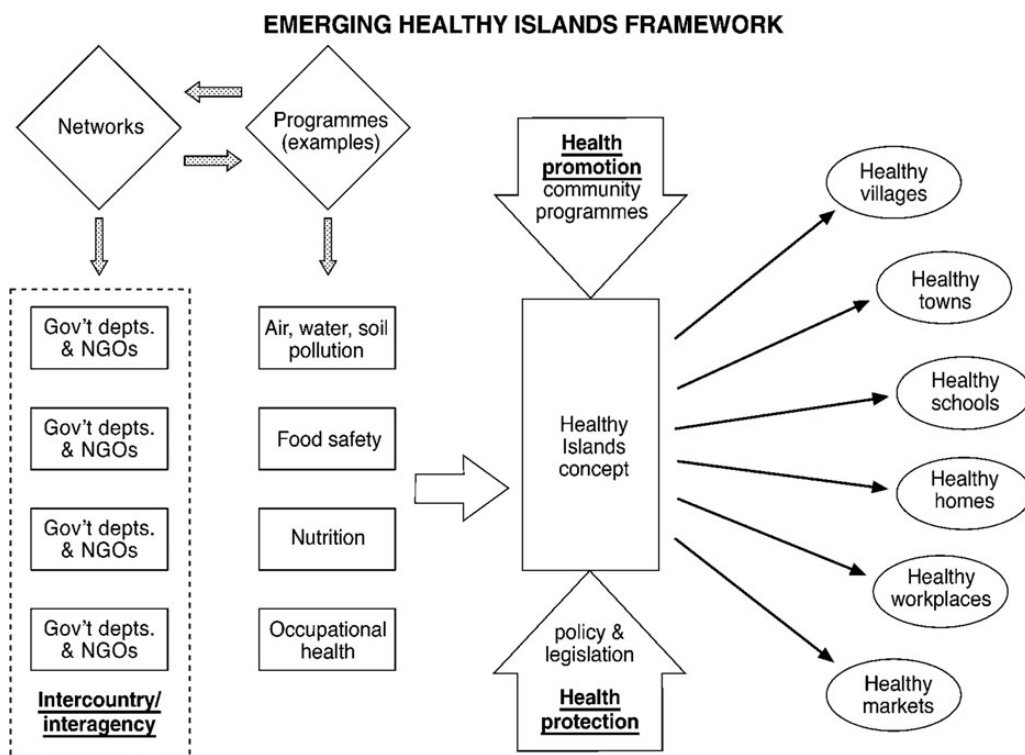


Fig. 1: The original vision for the Healthy Islands framework (reproduced with permission from Galea et al., 2000).

Table 1: Precedents for climate change and health considerations in FSM, Marshall Islands and Palau

FSM	Marshall Islands	Palau
Nationwide Climate Change Policy (2009)	National Climate Change Policy Framework (2011)	Palau Master Plan (draft 2011)
Second National Communication to the UNFCCC (2011 draft)	Joint National Action Plan for Climate Change Adaptation and Disaster Risk Management (draft 2011)	Pacific Adaptation to Climate Change project (2009-current)
National Strategic Development Plan 2003–2023	RMI Strategic Development Plan ('Vision 2018')	National Climate Change Adaptation Plan (draft 2011)

national vulnerability assessments and adaptation plans, several countries in the region noted the potential for climate change to impact on health, even if the general level of understanding of those effects and the substantive contribution of the health sector were limited at that stage (WHO, 2014b).

Part of the explanation for the health sector's apparently slow response to this issue was the assumption that, with respect to mitigation in particular, but also to a lesser extent to adaptation, the actions required would lie largely outside the health domain (Lovell, 2011). As awareness and understanding of the link between climate

change and health increased, however, the fallacy (at least partial) of this assumption was realized.

This realization prompted an urgent review of the health sector's priorities and responsibilities with respect to adaptation in the Pacific. This WHO-supported process, aimed to 'put health at the heart of the climate change agenda' (WHO, 2009) and involved the establishment of some novel linkages between the health and other sectors in these countries.

Table 1 lists some of the key documents and processes that incorporated considerations of the health impacts of climate change in FSM, Marshall Islands and Palau prior

to the WHO and health sector-led vulnerability and adaptation assessment processes of 2010–11.

In the following sections, the actors, processes and contexts of the health vulnerability assessment and adaptation planning work in FSM, Marshall Islands and Palau are described, along with a novel, Pacific-specific climate change and health governance framework, based on the Healthy Islands vision.

PROCESS AND FINDINGS

Throughout 2010 and 2011, the WHO Division of Pacific Technical Support, with support from the WHO Western Pacific Regional Office and funding from the governments of the Republic of Korea and Japan, assisted the FSM Division of Health and Social Affairs (DH&SA), Marshall Islands Ministry of Health (MoH) and Palau MoH in a project that had two aims: assessing each country's vulnerability to the health impacts of climate change and compiling National Climate Change and Health Action Plans (NCCHAPs).

The process of performing each country's vulnerability assessment, and planning adaptation strategies to manage these threats to health, followed WHO guidelines (Kovats *et al.*, 2003) and incorporated both qualitative and quantitative elements. These elements included stakeholder consultations, community surveys, expert consensus and analysis of the available climate and health data.

In-depth discussion of the results of these assessments and plans for adaptation is outside the purview of this article, which focuses on the governance issues related to the vulnerability assessment and adaptation planning process. (Further details regarding the climate change and health vulnerabilities and adaptation plans for these and other countries in the Pacific region may be found in a forthcoming WHO report entitled *Human Health and Climate Change in Pacific Island Countries*, which will link to a supplementary volume containing all

of the respective NCCHAPs.) However, a summary of the highest priority climate-sensitive health risks (as determined by the mixed-methods approach described above) in FSM, Marshall Islands and Palau are presented in Table 2.

The main actors involved in climate change and health adaptation planning as part of the WHO-supported project in each of the three countries are listed in Table 3, with a distinction made between those that coordinated activities and those that were otherwise involved in the process (participants).

There are some important points to note from Table 3. The first is that the table lists only participants in the climate change and health adaptation planning process; many more actors and agencies, particularly community groups, non-government/civil society organizations, educational facilities and others will likely (and necessarily) be involved in implementation of these activities in each country. There was a notable paucity of participation by these latter groups in the planning process; this was inevitably detrimental to the process and was largely due to constraints faced by the coordinating agencies, in particular the short timelines available for consultation.

With respect to geographic representativeness, all four states of FSM were involved in the consultation process, and Palau's highly centralized population was also surveyed as part of the project. In Marshall Islands, however, only representatives of organizations and communities on the capital atoll of Majuro were included, meaning that the outer island perspectives were lacking, as was that of the densely populated atoll of Ebeye.

The second point to note from Table 3 is that, with a few notable exceptions (such as, for example, partnerships between the health sector and other agencies responsible for water safety, supply and sanitation; food safety testing; waste disposal and vector/pest control), prior to this climate change and health work, the health sector had little

Table 2: High priority climate-sensitive health risks in FSM, Marshall Islands and Palau

FSM	Marshall Islands	Palau
Vector-borne diseases (e.g. mosquito-borne viruses such as dengue, Zika)	Vector-borne diseases (dengue)	Vector-borne diseases (dengue)
Water-borne diseases	Water-borne diseases	Water-borne diseases
Food safety, security and malnutrition	Food-borne diseases	Food-borne diseases
Zoonoses (e.g. leptospirosis)	Malnutrition	Zoonoses (leptospirosis)
	Respiratory diseases	Respiratory diseases
		Non-communicable diseases
		Mental health disorders
		Traumatic injuries and deaths (from extreme weather events)

Table 3: Actors involved in climate change and health adaptation planning activities in FSM, Marshall Islands and Palau

Actors	FSM	Marshall Islands	Palau
Coordination	Office for the Environment and Emergency Management	Office of Environmental Planning and Policy Coordination	Pacific Adaptation to Climate Change 'Core Group'
	Department of Health and Social Affairs	Ministry of Health	Ministry of Health
	WHO ^a	WHO ^a	WHO ^a
Participation	Environmental Protection Agency	Environmental Protection Agency	Office for Environmental Response and Coordination
	Weather Service Office	Ministry of Transport and Communication	Bureau of Agriculture
	Department of Resources and Development	Ministry of Resources and Development	Bureau of Marine Resources
	Department of Agriculture	Ministry of Internal Affairs	Environmental Quality Protection Board
	State Health and Environment Services	Weather Service Office	Weather Service Office
	Island Food Community ^b	Chief Secretary's Office	Palau Automated Land and Resources Information System

^aWHO consultants from the University of Nagasaki (Japan), University of Tsukuba (Japan) and Seoul National University (Korea), as well as staff from the Division of Pacific Technical Support participated in the climate change and health vulnerability and adaptation assessments in all three countries.

^bNon-government organization.

reason to work this closely with many of the other actors, despite the earlier mandates from WHO and other UN agencies stretching as far back as the early 1990s (at the time of the abovementioned Earth summit in Rio de Janeiro). This phenomenon will be elaborated below.

DISCUSSION

The unprecedented nature and scale of the health risks posed by climate change has necessitated a relatively radical transformation in the governance processes required to effect the necessary protective measures. This process necessitates embracing interdisciplinary collaborations. The distinctive feature of the new relationships required by climate change lies in the need for health sector actors to reach beyond normal boundaries and engage—simultaneously—with disciplines as diverse as meteorology, agriculture, water, transport and energy.

As argued by Walt and Gilson two decades ago, the actors, process and context of health sector reform—in developing countries such as those under study—are at least as important as the content of the policies themselves (Walt and Gilson, 1994).

The implications for this work on climate change and health in Micronesia and the wider Pacific region are that, while the NCCHAPs contain important and useful information for health adaptation planning, they are only part of a broader process that relies heavily on the engagement

and effective collaboration of appropriate agencies to facilitate adaptation. The NCCHAPs are, in effect, evidence-based policy recommendations; their implementation requires political will, resources and cooperation (McNeill and Ottersen, 2015). In addition, there is the imperative to support mitigation efforts (including within the health sector), enabling of co-benefits (The Intergovernmental Panel on Climate Change (IPCC) defines co-benefits as ‘. . . positive effects on human health that arise from interventions to reduce climate-altering pollutants’. Examples of co-benefits include reducing air pollution and the use of motorized transport.) and the protection of the health of island communities in the face of climate change.

These interlinked concepts are depicted below, in the form of a modified Healthy Islands framework for climate change adaptation (Figure 2).

The framework in Figure 2 makes explicit the original intent of the Pacific health ministers to embed climate change and health adaptation within the Healthy Islands vision (WHO & Secretariat for the Pacific Community, 2009) and builds on the theoretical foundation of earlier work on climate change and health governance (Bowen *et al.*, 2013) in describing a contemporary, real-world example of health systems adaptation to climate change in the Pacific.

In brief, the proposed mechanism for this model of climate change and health policy implementation in the Pacific is as follows: cross-sectoral collaboration from

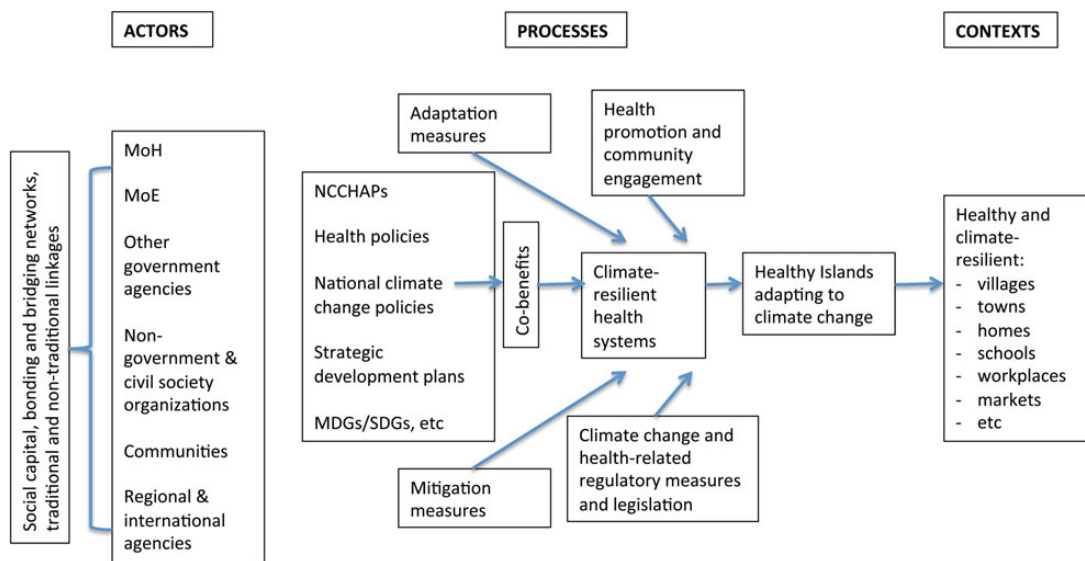


Fig. 2: Healthy Islands framework for climate change adaptation.

multiple actors (across government agencies, non-government and civil society organizations, as well as regional institutions, donors and technical agencies) inform policies and enable appropriate and effective adaptation and mitigation measures to be implemented. These then contribute—in parallel with the processes of engaging the community and regulatory bodies—to the building or strengthening of ‘climate-resilient’ health systems, which protect population health and promote wellness in island communities, in coordination with policies and actions in other areas of society. The model has deliberately been kept close to its initial form, to acknowledge the significance of the original vision, and make clear the opportunity to adapt the model to the climate change context.

It is intended that this model for climate change and health governance and policy development for PICs complement the national vulnerability assessments and adaptation plans completed as part of the WHO regional project. These will be summarized in the aforementioned WHO report entitled ‘Human Health and Climate Change in Pacific Island Countries’, to be published in late 2015.

It has been suggested that an ideal environment for climate change and health governance may include four key elements: social capital, non-state-based actors, informal networks and bridging organizations (Bowen *et al.*, 2013). Each of these elements was represented, to a greater or lesser extent, in the health vulnerability assessment and adaptation planning process in these three study countries.

Of particular interest, with respect to networks and social capital in this context, was the collaboration and level

of cooperation between the health and other sectors on this climate change and health vulnerability and adaptation assessment and planning process, which was reportedly rare and, in some cases—such as the partnership between the government departments of health and meteorology—without precedent.

This is despite earlier regional and global initiatives requiring cross-sectoral-collaboration, such as disaster management, occupational health, tobacco control and the compilation of National Environmental Health Action Plans. While the reasons were not clear, the feedback from these study countries affirmed the novelty of the collaboration across agencies in this context. To quote an official from the Marshall Islands Office of Environmental Planning and Policy Coordination (OEPPC):

... this climate change and health project is the first time we’ve sat and worked together with our colleagues from the Ministry of Health. (Palau Ministry of Health & WHO, 2012)

Within these rarely charted interdisciplinary waters, there also arises the potential for confusion and overlap with respect to authority—here understood to refer to legitimacy or the capacity to exercise power (Biermann *et al.*, 2009; 2010)—when the issue in question can reasonably be seen perceived to fall within the remit of customarily separate or independent actors. Among UN agencies, for example, both WHO and the United Nations Development Programme (UNDP) are highly active in the field of climate change and health adaptation in the Pacific region and

elsewhere. Despite their different mandates—WHO's role is highly technical, while UNDP is an implementing agency—it can be difficult for other organizations, communities and individuals to see and understand the delineation of roles and responsibilities. It is therefore necessary for those involved in health adaptation to be wary of the pitfalls that have been observed to result from proliferation of actors in a relatively small but crowded arena such as health governance. Such unintended negative consequences include lack of accountability, fragmentation of services, duplication of content and competition for resources—financial, human and physical (Gostin and Mok, 2009; Frenk and Moon, 2013).

As described above, health issues had previously been considered in the early stages of adaptation planning by the climate change coordinating agencies in FSM, Marshall Islands and Palau, respectively, the Office of Environment and Emergency Management, OEPPC, and the Pacific Adaptation to Climate Change 'Core Group'. When the health sector in each country subsequently conducted their own climate change and health vulnerability assessments, under the guidance of WHO, this gave rise to the critical question: on whose authority should the resulting adaptation plans be implemented?

In considering this phenomenon of possible confusion and overlap with respect to authority, a distinction has been proposed in the literature between *formal* and *effective* mandates (Lee *et al.*, 1996). (A formal mandate is an agreed statement of an organization's overall purpose or *raison d'être*, usually summarized in a constitution, charter or articles of association/agreement. An effective mandate refers to the actions or exercising of responsibilities of an organization; this may be viewed as how the formal mandates are interpreted and operationalized over time (Lee *et al.*, 1996).) This same distinction may be useful in evaluating the recent history of climate change and health adaptation activities in the three study countries. There, the coordinating agencies were essentially exercising 'effective' authority by taking the initiative to address the problem in the initial stages, while the health sector (including WHO) took longer to respond and exercise its 'formal' authority in conducting health sector-specific vulnerability and adaptation assessments.

The multi-tiered structure of the climate change and health vulnerability and adaptation assessment process, with the division of initiative and responsibility between WHO, the national health agencies and the non-health coordinating agencies, was often opaque in these three study countries, as in other PICs. This raised the prospect of a diminution in the authority of the state actors if, as was entirely possible, it had been perceived that WHO (or other external actors) were setting the agenda.

Despite these issues, a particular feature of governance structures in these three countries enabled a significant degree of representation, participation and transparency when it came to the adaptation planning process. This advantage was largely due to the personal relationships between individuals in positions of influence in these three small countries. Even though the linkages described above between actors and agencies may have been non-traditional, in countries with small populations such as Pacific SIDS, there are often very few 'degrees of separation' between individuals, particularly those who work for government or are prominent in community or other non-government/civil society organizations (Poutiainen *et al.*, 2013). Hence it proved not to be difficult to arrange, for example, high-level meetings between representatives of organizations with scant previous history of collaboration, and there was enthusiasm between some of these new partners (for example, the departments of health and meteorology) to work together on health protection initiatives requiring complementary expertise, such as climate-based early warning systems for communicable disease epidemics.

An additional enabling factor—it could only perversely be considered an advantage—with respect to climate change governance in the study countries is the shared sense of urgency with respect to action on climate change. This common imperative, which extends to health adaptation, is likely to be a significant contributing factor with respect to the willingness of various actors to collaborate.

The combination of high levels of vulnerability, relatively strong policy commitments and some unique governance aspects relating to social capital in these three SIDS have the potential to negate some of their inherent disadvantages, such as small populations and lack of wealth—two factors that have been shown to correlate with weaker adaptation potential and action (Lesnikowski *et al.*, 2013).

Finally, it should be acknowledged again that the contributions of non-government agencies and civil society organizations in both the climate change and health project in the Pacific, and the formulation of the original 'Healthy Islands' vision, was relatively light. Thus, an obvious opportunity to strengthen the model would be to consult more widely with community representativeness and other stakeholders, to ensure the highest levels of relevance and uptake to enable effective policy implementation to protect health.

CONCLUSION

Climate change and health adaptation planning in FSM, Marshall Islands and Palau tested traditional health governance structures. The commencement of health

adaptation planning in the Pacific region two decades prior, without substantial, technically informed health inputs, took the initiative away from the health sector. The WHO-supported vulnerability and adaptation project in PICs formally brought the health sector to the 'climate change adaptation table'.

As a product of the vulnerability and adaptation assessment process, non-traditional linkages were formed between the health sector and other actors, which enabled more informed and efficient adaptation planning, although it remains to be seen whether this will translate into effective implementation.

The formation of such novel relationships and unprecedented levels of inter-agency collaboration were made possible, in large part, by the strong informal networks and high degree of social capital that exist in such small countries. The strong climate change policy commitments and sense of urgency shared by these and other PICs were found to be important additional catalysts in planning health adaptation strategies.

The process of assessing climate change and health vulnerabilities and planning adaptation strategies in these three countries enabled them to articulate a framework for action on climate change within the Healthy Islands vision for the Pacific. This year, the Pacific health ministers met again in Yanuca and celebrated the twentieth anniversary of the 'Healthy Islands' vision. In doing so, they revised the regional health policy approach to that of 'Islands of Wellness'—a framework well suited to the approach described in this article.

It is intended that this context-specific paradigm for climate change and health governance will facilitate stronger inter-agency coordination and cooperation and clarify important links between relevant policies, processes and people, in an effort to protect the health of these and other Pacific island communities from the health impacts of climate change.

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