

Research Article

ICTs in Climate Change Communication in the Pacific Islands

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Abstract

Community participation is essential to effectively address communities' needs in relation to climate change. Conventional media forms that are easily accessible in the Pacific Islands region, including digital media, require strategic integration of both message creation and dissemination with stakeholder inclusion. This article argues that use of information and communication technologies (ICTs) not only enables information dissemination, but also invites local participation in communicative processes. Greater citizen engagement in content creation improves community understanding of the issues around climate change by including local perspectives, cultural knowledge, and concerns specific to the area. Recording, sharing, and discussing these changes in community settings will inform new thinking, with the potential to change perceptions and attitudes toward this urgent problem.

Introduction

Communicating climate change messages in ways that are easily understood by locals has been recognized as one of the main communication challenges in the Pacific Islands (Harris, 2013, 2014; Hayes, 2008; Korauaba, 2014; Lata & Nunn, 2011; McNamara, 2008; Patel, 2006; Tacchi, Horst, Papoutsaki, Thomas, & Eggins, 2013a). The Pacific Islands region has come to epitomize the doomsday visions of climate change in the international media, with Tuvalu as its poster child. This has led scientists, policy makers, and environmental advocates globally and in the Pacific Islands to recognize an added urgency to improve this communication due to the vulnerability of communities to climate change impacts (Barnett, 2005; Barnett & Campbell, 2010; Harvey, 2014; IPCC, 2014; Kuruppu & Liverman, 2010). Yet, among Pacific Islander communities, understanding of climate change's impact is limited. Some authors contend that not enough effort has been made to hear and include the local island voices in the debate over the impact of climate change (Kelman, 2010; Paton & Fairbairn-Dunlop, 2010), which is an important part of ensuring the local population is fully mobilized.

This article examines how community concern about climate change may be mobilized through the development of community-based digital media. We locate our discussion of information and communication technologies (ICTs) and climate change within a communication for development framework that puts the emphasis on

the use of communication processes, techniques and media to help people toward a full awareness of their situation and their options for change, to resolve conflicts, to work towards consensus, to help people plan actions for change and sustainable development, to help people acquire the knowledge and skills they

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need to improve their condition and that of society, and to improve the effectiveness of institutions. (Fraser & Restrepo-Estrada, 1998, p. 63)

Such an approach stresses how initiatives might use communication to improve practices, to learn, and to help achieve sustainable development through participation with people on the ground via diverse forms of communication. These range from interpersonal modes such as community dialogue; various types of media such as community radio, participatory video, and digital storytelling; entertainment education, including television and radio dramas, animation, theatre, and music; and ICTs, including mobile phones and the Internet (Lennie & Tacchi, 2012).

Using this framework we argue throughout this article that effective ICT use should not only aid information dissemination, but also should be leveraged to invite local participation in communicative processes. We begin our argument by highlighting the key issues impeding climate change communication in the Pacific, including community perceptions and attitudes, and offer some innovative examples of ICT use for community content production in response to these challenges. The second half of this article examines a case study of participatory media training to demonstrate how capacity building in digital media at the community level may offer a solution for networking and knowledge sharing about adaptation. We conclude by exploring how increased citizen engagement in content creation improves community understanding of the issues around climate change because it integrates local perspectives, cultural knowledge, and concerns specific to the community and nation.

ICTs and Climate Change

ICTs are important resources in solving complex environmental problems such as climate change (Cave, 2012; Yap, 2011). *ICTs* are defined as “an expanding assembly of technologies that can be used to collect, store and share information between people using multiple devices and multiple media” (Chapman & Slaymaker, 2002, p. 1). Convergence of conventional technologies such as telephone, radio, and television with newer forms such as the Internet, wireless, and satellite technologies, coupled with computers and mobile devices, have delivered easier access to information and participation in content creation. *Digital media* in this article refers to those devices that allow for storage and retrieval of information in digital form, specifically video cameras, audio recorders, still cameras, and smartphones. Throughout this article we refer to *conventional media* as mainstream mass media such as press, radio, and television, including their online presence.

Research exploring the links among ICTs, climate change, and development has identified four main areas of ICT use—mitigation, monitoring, adaptation, and strategy (Ospina & Heeks, 2010). We apply this framework of ICT use to gain a better perspective of ICTs’ potential in climate change communication. The UN’s Food & Agriculture Organization has identified three main functions of ICTs: “(1) to record data and information, (2) to transform the data and information into knowledge which can be shared and, eventually (3) communicate the data, information and knowledge” (Sala, 2010, p. 3). Appropriate ICTs for specific situations and communities can play a primary role in efforts to “develop, plan, implement and manage adaptation strategies,” and to improve communication within and between communities (Sala, 2010, p. 6; Yap, 2011). Information-based technologies are most effectively used in mapping long-term climate change and monitoring short-term climate variability, whereas communication-based technologies assist in information and knowledge transfer (Sala, 2010). In adaptation processes ICTs are most effective in networking and knowledge exchange of good practices, inclusion of vulnerable communities in decision making for best policy outcomes, and integration of information and knowledge that have local relevance in reducing risk and vulnerability (Ospina & Heeks, 2010). Message creation and dissemination must be strategically integrated with stakeholder inclusion using conventional media forms (participatory video and community radio) and new media (mobile and online platforms).

Climate Change Overview in the Pacific

Despite the fact that South Pacific Islands emit less than 0.01% of total global greenhouse gases responsible for climate change, the region is among the most vulnerable in the world to its negative impacts (OXFAM,

2015; WWF Pacific, 2015). Pacific Island countries experience a wide range of vulnerabilities because of their small size and geographic location in the world's largest ocean (Nunn, 2009). More than 50% of the region's population lives within 1.5 km of the shore, and many of these countries are barely a few meters above sea level, putting them at extreme risk from sea level rise. Changes are already being recorded in the region's climate and ocean. Parts of the western Pacific have experienced the fastest rate of sea level rise in the world at 10mm per year (SPREP, 2013).

Rising sea levels are just one of the many effects of climate change in Pacific Islands, which also include an increase in the frequency and intensity of cyclones, coral bleaching, coastal erosion, changing patterns of pests and diseases, saltwater intrusion, storm surges and flooding, increased temperatures (affecting taro production on lowlands, increasing risk of fire), and drought. Associated impacts, both currently experienced and projected, threaten communities' livelihoods and long-term viability. Irregular rainfalls resulting in floods and droughts will have a devastating impact on agricultural production, forcing reliance on imported foods and threatening the livelihood of local farmers (Harris, 2014; SPREP, 2013).

Permanent cross-border resettlement is one of the projected impacts of climate change for some small island states, among them Tuvalu, Kiribati, and the Marshall Islands, where their populations are now coming to terms with the prospect of becoming climate refugees (McNamara & Gibson, 2009; Yamamoto & Esteban, 2014). Kiribati has already made provision for the future by purchasing land in Fiji.

ICTs and the Communication Context

The Pacific Islands have a complex and rich communication and media environment. Many newspapers and newsletters are published and are increasingly available online. Radio seems to remain a key media platform for communication across vast distances and audiences. Television retains its importance, mostly in urban areas, with a growing trend toward watching it via satellite and cable, which provide greater access to foreign content to the detriment of local material.

Alongside conventional broadcast media, new forms of technology have entered the media and communication landscape. The mobile phone appears to be the most ubiquitous of these technologies. In places such as Papua New Guinea, where radio has been a dominant and effective platform, recent studies suggest that more households now have access to mobile phones than to radio (Intermedia Europe, 2012). In fact, research (Cave, 2012; Intermedia Europe, 2012) shows a rising trend in the use of mobile devices to access radio programs. One report, *Economic and Social Impact of ICTs in the Pacific* (Minges & Stork, 2015), found that penetration of mobile phones has risen from 49% in 2007 to 86% in 2013. In Papua New Guinea, for instance, mobiles are among the most common ways to access the Internet, with Facebook one of the most accessed sites. The number of Facebook users in the region grew over 250%, from 157,000 to 457,000, between 2011 and 2014, with 80% accessing the social media site via mobile phones (Minges & Stork, 2015).

The Southern Cross Cable Network links the West Coast of the United States, Hawaii, Fiji, Australia, and New Zealand with high-capacity fiber optic cable, with new connections to Tonga, Vanuatu, and Samoa. This has resulted in a phenomenal 1,500% rise in international Internet bandwidth, from less than 100 Mbit per second to over 5 Gbits per second in Fiji and over 1 Gbit per second in Samoa and Vanuatu. Solomon Islands is still not connected (Minges & Stork, 2015). Pacific leaders aspire to the transformative effects ICTs have on their communities and economies. This will enable the region to leapfrog more outdated and expensive systems. Meanwhile, the report by Minges and Stork (2015) notes, "The region is still coming to grips with the novelty of abundant bandwidth, enhanced coverage and cheaper tariffs" (p. 1), with user uptake of fixed broadband and 3G still limited. In addition, the report recommends developing basic digital literacy among the general public.

Yet, as the media and communication environment becomes more complex, questions remain about the appropriateness of ICTs for specific purposes such as during emergencies and disasters. The ability of broadcasters and technicians to keep current with the latest equipment and software is sometimes an issue. There is also a greater need for understanding the possibilities of integrating ICTs like mobile phones into media and communication plans for disaster-response technologies such as broadcast radio (Tacchi, Horst, Papoutsaki, Thomas, & Eggins, 2013a).

Methodology

The material from this article draws on research carried out through the Pacific Media Assistance Scheme (PACMAS)¹ baseline research project that documented the state of media and communication across 14 Pacific Island nations. One of the focus areas reviewed media and communication content associated with climate change. The main research methods included desk-based research, stakeholder interviews, and a verification of survey findings with recognized authorities in Pacific media and communication, who provided a panel of experts. Interviews were conducted with climate change scientists, government representatives, media practitioners, and NGO/CSOs that have climate change as part of their remit. The interview questions gathered information in the following areas: policies, adaptation and mitigation strategies, partnerships, awareness, communication of climate change, communication training, civil society, communication and media networks, links with media professionals and educators.

The participatory video training case study discussed in the second half of this article took place in Fiji in 2013. Research for this case study included interviews with the participants at the end of the training, participant observation by this article's first author, who conducted the training, and her reflections on the production process and workshop discussions. The aim of the research was to ascertain if and how the capacity-building workshop in digital media would enable participants to record, share, and discuss environmental changes in their community setting.

ICTs and Participation in Climate Change Dialogue

ICT use in the Pacific Islands must be seen in terms of challenges faced and within the wider communication context, including the culture and belief systems of Pacific Islanders, which influence their perception of climate change. Public awareness is often complicated by a belief in Christian narratives, a point made by many interviewees. One person pointed to the blind faith many people demonstrate in terms of divine protection from natural disasters: "The people [are] saying no, God give us this land, yeah, and you know, he gave us this land, he will look after us as he's always done" (Tuvalu09 in Tacchi, Horst, Papoutsaki, Thomas, & Eggins, 2013g, p. 9). There are also barriers to communicating emergency preparedness knowledge due to a conflict between disaster information and religious beliefs: "Religious beliefs about God's promise to Noah to never flood the earth creates a casual attitude towards any attempts to educate the community on emergency preparedness" (Kiribati09 in Tacchi, Horst, Papoutsaki, Thomas, & Eggins, 2013c, p. 8).

Churches in the Pacific are acutely aware that the overall wellness of the Pacific people will be affected by climate change impacts (Gero, Méheux, & Dominey-Howes, 2010). The Pacific Conference of Churches² has been leading the advocacy and awareness programs on climate change through face-to-face communication, using its strong network of church leaders and women's and youth organizations and by appealing to the church community to "not wait for the heavenly aspect to receive justice and happiness—we are called to action now . . . because God wills us to do that" (Fiji12 in Tacchi, Horst, Papoutsaki, Thomas & Eggins, 2013b, [raw data])

The following section identifies ways in which both conventional and digital media have been adopted in climate change communication to reflect the daily experiences of Pacific Islanders. The majority of examples discussed here fall either under strategy (awareness and capacity building) or adaptation (informing and networking, livelihoods, food, water; Ospina & Heeks, 2010).

Media Reporting

Mainstream media are seen as important channels for raising awareness. Key findings from the PACMAS research indicate that participants in the PACMAS Media and Communication Report 2013 highlighted how media reporting, and more specifically the language used by journalists, is a common issue and plays a key role

1. It covers 14 Pacific Island Forum member countries: Fiji, Papua New Guinea, Solomon Islands, Vanuatu, Cook Islands, Niue, Samoa, Tonga, Tuvalu, Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, and Palau.

2. PCC is a regional ecumenical organization of 29 member churches from around the Pacific.

in documenting climate change. Almost all respondents across the 14 countries in the study pointed out that the translation of scientific terms into local languages or in terms that communities can understand is challenging. While general awareness has been raised, journalists express difficulties in reporting interesting and new stories around the “same” issues:

I worry about the rural areas, where it's very basic, very rudimentary information about what climate change is, but they know—they recognize the changes—they just say it must be climate change but the full understanding of how one thing leads to the next—the cause and effect—that is what we try to do (Fiji05 in Tacchi et al., 2013b [raw data])

Fiji One TV encourages one of its journalists to specialize in climate change to help authorities convey their messages, bridging the jargon gap or technical term gap between scientist and journalist (Tacchi, Horst, Papoutsaki, Thomas, & Eggins, 2013b).

In some countries such as Kiribati and Palau, people report information fatigue with regard to climate change:

It's hard to make climate change new and interesting. I mean we've been hearing about it for so long, that we need . . . some kind of a source that's providing us with new angle stories that we can kind of make into a local story. (Palau03 in Tacchi, Horst, Papoutsaki, Thomas, & Eggins, 2013f, p. 8)

This might be attributed to the difficulty of translating climate change issues into local stories that are relevant to people who might not see climate change as an immediate threat (Tacchi et al., 2013a). A more effective way to communicate climate change would be to use local examples of environment changes as suggested by an interviewee from Marshall Islands:

You know, these are all things that people notice on their own. . . . the coastal erosion, the trees that are going down, the gravesides that are going down and that's where we point out and say “that's climate change,” that's an effect of climate change, and that's gonna continue to happen. So those are the ways that we're able to connect with community members. (Marshalls01 in Tacchi, Horst, Papoutsaki, Thomas, & Eggins, 2013d)

In Niue some participants expressed a need to acknowledge traditional ways to predict extreme weather patterns.

Some people when they look out the sea, the birds, if the skies are a bit . . . orange. . . , know there's a cyclone out there. We . . . start putting up our shutters even though the warning hasn't come out yet. Sometimes traditional knowledge actually helps us a lot more than some of the scientific stuff. (Niue07 in Tacchi, Horst, Papoutsaki, Thomas, & Eggins, 2013e, p. 10)

There is a propensity to report on events in the urban center because it is cheaper and faster. Reporting from the field is important in order to share the work of scientists or community efforts in adaptation; however, resources are not always available for this to occur. With a growing social media presence in the region, Facebook and, to some degree, Twitter have become sources of information for journalists during natural disasters. For example, radio stations in Fiji and Vanuatu have turned to Facebook to receive updates from listeners in affected areas during floods and cyclones (Tacchi et al., 2013b).

Regional Networks

Messages about climate change are disseminated at a regional level through various organizations and networks. *The Pacific Adventures of the Climate Crab* and *Cloud Nasara* are good examples of the edutainment model, in which short, animated films help increase awareness of the science and impacts of climate variability in the Pacific, with specific focus on how to prepare for future El Niño and La Niña events. This project is a collaboration between the Red Cross and the Australian government's Pacific-Australia Climate Change Science and Adaptation Planning Program.³

3. www.pacificclimatechangescience.org/animations/

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The Pacific Climate Change portal⁴ acts as a hub for climate change information and knowledge sharing through resources such as an events calendar, links to documents, databases, an image and video gallery, and glossary definitions that are hyperlinked to key terms. Pacific Solutions Exchange,⁵ a UN Development Programme listserv, encourages dialogue among its membership. Members post inquiries on specific topics and share answers, insights, experiences, and lessons learned to help their counterparts in the Pacific (Harris, 2014).

Fading Paradise is a multimedia resource developed by the Foundation of the Peoples of the South Pacific International to improve people's understanding about climate change. It is a compilation⁶ of eight fiction stories by author Jim Bentley that portray the detrimental effects of climate change in the Pacific and are available in the form of comic books, audio CDs, 2D animation videos, and Braille.

Community-led Media

The communication challenges presented above point to the potential that ICTs present in addressing issues of local participation and content that are inclusive of gender, youth, and marginalized communities. As female-headed households are most affected by climate change impacts, Ospina and Heeks (2010) suggest that ICTs could play a key role by providing relevant information, capacity building, and empowerment to strengthen women's adaptive capacity.

Community radio is an important forum that invites participation by and gives voice to women and youth. FemLINKPACIFIC, a women-led community radio station in Fiji, has been documenting women's experiences with floods and other natural disasters in their communities since 2004. It has a Facebook presence and uses rural networks such as women's clubs. FemLINKPACIFIC campaigns for gender-based disaster risk management–response strategies “because women are often left out of the formal discussions and decision making process in any disaster although they are the ones that are responsible at household level” (Fiji15 in Tacchi et al., 2013b [raw data])

Given the popularity of social media in the region, this tool is more likely to make it easier for communities to actively shape and take part in their own awareness process, introduce their own solutions to climate change mitigation, and share these solutions with other Pacific communities. Project Survival Pacific, Fiji's youth climate change movement, is a good example of youth-based social media, which mainly shares stories through its Facebook page⁷ to reach out to young people, using approachable language. UNICEF Pacific's use of social media, in particular Facebook,⁸ provides a better example of successful youth engagement in climate change communication. When its one-way communication-sharing platform resulted in poor youth engagement, they changed to a participatory approach that provided users with not only more opportunities to share and co-create, but also to control the Facebook page. This resulted in a 1,600% increase in engagement, including the youth-driven online game Pacific Climate Change, whose objective is to explore social media as a platform for co-creating content.⁹ This offers a good example of ICT use for interactive social dialogue, youth engagement, and participatory communication.

Participatory media training projects have been implemented regionally as part of the PACMAS strategic activity on climate change awareness that has seen the adoption of innovative participatory approaches that highlight local issues through community involvement. A notable project is the Action Against Climate Change (A2C2), which has produced a series of 21 videos as well as audio and online content to mentor high school students across the Pacific in the production of media content to raise climate change awareness and to understand how climate change will affect their lives and futures. This content has been disseminated through

4. www.pacificclimatechange.net

5. www.solutionexchange-un.net

6. www.pacmas.org/profile/fading-paradise-a-comprehensive-climate-change-resource-for-the-pacific/

7. <https://www.facebook.com/projectsurvival>

8. <https://www.facebook.com/likeunicefpacific>

9. https://www.facebook.com/likeunicefpacific#!/likeunicefpacific/app_130438327038952

television, radio, newspapers, and online platforms.¹⁰ The implementing partner, Apidae Development Innovations' Joelle Auffray (2013), noted:

A2C2 is about engaging youth to use their unique voices to create compelling media content across different platforms about climate change issues. These youth-driven media products will be seen and heard by decision makers across the Pacific to raise awareness about climate change issues and adaptation options.

The films have received international exposure, reaching the final rounds of the Action4Climate film competition sponsored by the World Bank's Global Communication Program. The films were also screened at the Cannes Film Festival, in Times Square, and at a private meeting of World Bank Group leaders, the International Monetary Fund, the United Nations, and the Pacific Media Summit.

Another participatory initiative shared by members of Pacific Solutions Exchange¹¹ includes the NGO 350.org, which coordinates global climate movement and offers its teams working on the ground across the Pacific the opportunity to share their own perspectives on climate-related issues. Participatory media has become an important element of its work as it ensures stories about climate impacts coming out of the islands are shaped and told by Pacific Islanders living with the impacts of climate change and not by someone else. This included the use of Twitter during tropical cyclones Pam in Vanuatu and Winston in Fiji. Further Arts, based in Vanuatu, runs a range of arts, media, and cultural projects to develop long-term social and commercial enterprises that are culturally, socially, environmentally, and financially sustainable. Further Arts, a community arts organization, uses a participatory methodology in a peer-to-peer knowledge exchange through its media hub in Port Vila, Vanuatu. Small Voices Samoa is an initiative led by Brianna Fruean, a young ambassador who is combating climate change, using YouTube and Facebook to advocate for her school and community to take better care of their natural surroundings. She attributes her success to the use of participatory media through which she engages with her local and international community. While these activities offer possibilities for a younger generation, issues of illiteracy and capacity often remain overlooked. For these reasons video and radio technologies are favored because they involve oral cultures and invite participation by those who cannot read or write.

Participatory Video Training

Participatory video is still underused in the Pacific, but it may prove to be a viable discursive space by which to engage communities in climate change issues. Projects are designed as bottom-up initiatives that enable integration of indigenous narratives and cultural practices. The production process helps a community understand the immediate risks from climate change by recording changes to their environment and their impact on daily life. Through dialogue with other community members, in discussions with environmental experts, and by researching traditional adaptation methods, community members learn how to plan for the future (Harris, 2014). An idea for the project cannot be imposed from the outside, but must come from within through an exchange of views on topics such as adaptation methods, agricultural productivity, or water use. The production process encourages people to think creatively about a problem, reach consensus, and take collective action through a democratic exchange that may challenge the hierarchical structure at local and national levels (Harris & Bau, 2014).

The following case study of a participatory video workshop conducted by the first author of this article provides more in-depth discussion of the process and participant feedback. An eight-day "training of trainers" workshop in participatory media production techniques was conducted in Fiji in 2013 with a small regional NGO, Pacific Gender Climate Coalition, for its in-country facilitators from Cook Islands, Fiji, Guam, Kiribati, Niue, and Papua New Guinea. The workshop consisted of discussions, hands-on training with video and audio equipment, and collaborative group work, resulting in the production of five short video stories on the subjects of climate change and sustainable industries. On the first day, participants were introduced to key terms and

10. www.pacmas.org/profile/action-against-climate-change-vanuatu/

11. www.solutionexchange-un.net/repository/pcl/ccd/cr50-eng-14042016.pdf

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concepts such as *participatory media* and *communication for development*. They were specifically asked to reflect on what the word *participation* meant to them, consider some of its challenges, identify their own methods of working with the community, and discuss how they might be able to integrate participatory approaches to their work on climate change. On the second day, the group was asked to collaboratively identify key themes and topics on climate change. They then divided into teams of two to develop story ideas. Hands-on training in all aspects of video production and digital editing continued throughout the week. For their final project, each participant identified a community with which they could produce a 5–10-minute story exploring a climate change theme. Viewing sessions, an important part of the participatory video process, allowed participants to provide feedback on both the technical and content aspects of each other's works-in-progress as well as to enjoy a sense of achievement.

The participants came from diverse professional backgrounds, including marine biology, law, education, and media, which invited insightful perspectives on how these areas inform climate change discourse (Harris, 2013). For example, the marine biologist observed, "People like me bring in the content and we learn the new tool to communicate the messages we have been trying to disseminate to the communities without much success."

Mainstream media's inability to reflect local perspectives because of journalistic practices and routines was recognized by the journalist on the team:

I think like a journalist. This training taught me to think about letting the community dictate what the story angle is and then let them tell it in their own words and decide how it should be told. They lead, we follow.

Two media students from Fiji National University worked alongside the participants as production assistants. This created an intergenerational knowledge exchange, with the students supporting the older participants in production exercises while increasing their own understanding of climate change issues. The workshop also included a retired school teacher with a disability. As a member of the production team, he was able to comfortably use audio recording equipment and even provide his wheelchair as a smooth dolly (moving shot) for some outdoor sequences.

Participants planned to include communities by asking them to share their stories such as through a then-and-now approach, looking at how things have changed over time through the eyes of village elders. This may include evidence of coastal erosion and its impact on heritage sites by comparing old and new photographs, or this may include the ways in which communities have adapted to these changes. Another important aspect of this workshop was a commitment by the participants to share their skills in camera and editing with two other people in their geographic area or area of expertise so that the knowledge would not be lost. The following comment by the NGO worker highlights the importance of including the people in the media production process:

Participatory media can bring people to the fore loud and clear where physical, economic, environmental, and social evidence would speak for themselves to influence people's thinking and, ultimately, government policies; and I believe that this is the brightest and noblest character of participatory media.

Funding¹² for the project enabled the purchase of four production kits that included a Handycam with built-in projector, waterproof still digital camera, audio recorder, Mac laptop for editing, and other peripherals such as microphones, spare batteries, and storage devices. Facilitators took these kits back to their communities to produce climate change stories and train other community members (Harris, 2014). While the dialogue process was important, challenges in creating "sustainable dialogue" persist. For example, it remains unclear how successfully the next phase of the project was implemented without follow-up visits and training. Time pressures on busy people who attend such training and a lack of continued capacity building and technical support can hinder effective skills transfer. Knowledge sharing at a community level remains a challenge and may require more permanent solutions such as setting up ICT hubs to support digital literacy.

12. Funding for this project was provided under the PACMAS Innovation Fund.

Conclusion

There are encouraging signs of ICTs being applied in climate change communication to help address some of the communication challenges identified by the PACMAS baseline research. However, Cave (2012) argues:

The use of ICT tools for development in the Pacific has been tentative and ad hoc. With the exception of mobile banking, mobile application options are very limited, both in terms of the quantity of applications available to Pacific populations and also in the scope of services offered. (p. 15)

Pacific Island leaders, like their Small Island Developing States counterparts, have recognized the importance of climate change communication. For example, in 2011 the Secretariat of the Pacific Community acknowledged the role ICTs can play in “the development, governance and sustainable livelihood of the people of the Pacific” (cited in Cave, 2010, p. 22); however, there remain significant limitations to implementing a coordinated ICT for development strategy. Any projects to disseminate ICTs must factor in a capacity-building component among end users as well as ensure maintenance and easy access to servicing the technologies in use (Harris & Bau, 2014). Currently ICTs are used in varied ways with varying skill. While there are attempts to integrate ICTs at various levels, these are top-down, passive information-sharing strategies. It is important to note that few are initiated at the community level.

The intractable problems posed by climate change will affect the socioeconomic development of island communities in the coming years, and ICTs offer ways by which vulnerable communities can participate in the climate change discourse at the national and global levels. Using innovative approaches, ICTs enable communities to create content of relevance to local audiences while giving voice to those on the margins, including youth, women, and people with disabilities. This article has identified key challenges to climate change communication and demonstrated some ways in which ICTs are being adopted for education, training, and awareness-raising campaigns in Pacific Island countries. A more comprehensive study is needed to expand our understanding of how community-led, culture-based communication might be fully integrated into climate change communication strategies in the Pacific. Improving people’s knowledge of the long-term consequences of climate change must begin with their increased understanding of local impacts that are already affecting their daily life. Recording, sharing, and discussing these changes within local community settings is the first step in changing people’s perceptions and attitudes toward this urgent issue. ■

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