FINAL REPORT JULY 2014

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Understanding Community Perceptions about Climate Change in the Pacific

SPARCK

Sharing Perceptions of Adaptation, Resilience and Climate Knowledge

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Contents

Contents

Tables

Figures

Foreword

Education is critical for sustainable development and is a key factor in the global response to increasing environmental challenges such as climate change. Education for Disaster Risk Reduction and Climate Change is critical in supporting Pacific Island countries in adapting to the consequences of their vulnerability to climate change. As our knowledge and experience of Disaster Risk Reduction and Climate Change Adaptation grows it has become increasingly important to understand local climate change knowledge and perceptions of adaptation and how communities manage the impact of climate change.

The Sharing of Perceptions of Adaptation and Climate Knowledge project (SPARCK) was developed to examine understanding of climate change risk perceptions in Pacific communities. The project aimed to evaluate community perceptions of climate change and identify opportunities for activities to increase resilience and mitigate the impact of climate change. The SPARCK project explored key questions relating to perceptions about the teaching of climate change, how information about climate change was communicated at the community level, what communities perceived to be the greatest challenges in addressing climate change and the actions they proposed for managing the impacts of climate change.

We sincerely believe that the SPARCK project has contributed to both analytical research and ideas on how key target sectors interact. It has indeed contributed to the development of tangible tools for teachers and communities and facilitated increased dialogue on the impact of climate change and disaster risk reduction. For instance, the development of a mobile phone survey to gather information relating to perceptions of climate change was the first of its kind in the Pacific region! The SPARCK project found that the perceived level of threat from Climate Change was different across the Pacific and that not all countries and groups were addressing Climate Change and Climate Change Education issues similarly. The SPARCK project results underlined the importance of understanding local perceptions and decision making processes in order to better design effective and resilient disaster risk and Climate Change Adaptation policies, strategies, tools and methods. It is therefore expected that this report showcasing the positive interactions and benefits of connecting teachers and communities through localized Climate Change education programmes will convince stakeholders of the importance of taking into account local practices, cultures and technical solutions to Climate Change Adaptations.

Finally, I sincerely hope that this report will help stakeholders to better understand each other's roles, needs, and challenges and the necessity for their long term genuine collaboration in addressing Climate Change Education in the Pacific

Etienne Clement
Director
UNESCO Apia

Teacher focus group survey in Samoa © UNESCO/D.C.Seng

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Reviewers: Sue Vize and Filomena Nelson

Children fishing at high tide in Samoa. © UNESCO/C.Spennemann

Executive Summary

Pacific Island countries are at the forefront of the battle against climate change. With increased exposure and vulnerability of Pacific Islanders to weather extremes resulting from human-induced climate change, it is becoming increasingly important to understand local climate change knowledge and local perceptions on adaptation, and how these relate to resilience and to action on managing the impacts of climate change.

Aims of the project

UNESCO initiated the Sharing Perceptions of Adaption, Resilience and Climate Knowledge (SPARCK) project to investigate how three groups – high school teachers, communities living near conservation areas and media officers – perceive climate change, and to examine their decision-making processes and adaptive capacities.

SPARCK aimed to assist in understanding:

- How teachers in Pacific Island countries can be better prepared to integrate content on climate change within the formal school curriculum to achieve more effective learning among students.
- How community decision-making in Pacific Island countries influences the management of the effects of climate change.
- The ability of the media in Pacific Island countries to communicate about climate change issues effectively.

Scope and methods

The SPARCK project was implemented through a partnership between UNESCO, Apidae Development Innovations and the University of Melbourne in three Pacific countries: Samoa, Fiji and Vanuatu. These countries were chosen because of their levels of exposure to the effects of climate change, levels of education on climate change, existing institutional partnerships and their ability to test new engagement and capacity-building techniques.

SPARCK was carried out in two phases between January and October 2013.

Phase I comprised data collection activities with teachers, communities and media officers, using focus groups and an innovative mobile phone survey, the first for the topic of climate change in the Pacific.

The focus groups, which were structured informally, discussed key issues and ideas associated with climate change relevant to the target groups. Inventive engagement activities were used to activate knowledge-sharing within the focus groups, including providing opportunities for every member of the group to share ideas in confidence (e.g. writing on small sticky-notes), voting for the issues they

thought were most important (e.g. using coloured sticky dots on white boards) and creating discussion through photo-sorting activities (the "Q-sort" method). Participants found these methods creative, easy to engage with, fun and useful in generating discussion on the issues.

A significant innovation in SPARCK was the use of a mobile phone survey to gather data. The data collected this way complemented the data collected through the focus groups. The use of the mobile phone survey also enabled the researchers to explore the opportunities and barriers in using this form of technology as a way of engaging with communities and gaining information directly from communities. The participants enjoyed sharing information in this way, but this data-collection method had some technical limitations, and challenges were faced in obtaining relevant data.

Phase II built on the findings of Phase I to implement a pilot project to build capacity in one country (Samoa), aiming to enhance resilience to climate change through improved knowledge and education.

During the implementation of the SPARCK project, an online presence was maintained through the SPARCK Facebook page, as a forum for interaction and discussion around the project.

Key Findings of Phase I

The findings reported here represent the perceptions of the three groups (teachers, communities and media officers) that were studied. As such, these findings do not necessarily reflect the actual state of climate change education and capacity building being carried in the three participating countries (Fiji, Samoa and Vanuatu) by their governments and partners.

Teachers

Teachers identified a need for climate change training. In Samoa, 65 percent of teachers in the focus group felt that capacity-building in the form of training and workshops for teachers would be the best solution to enable effective teaching about climate change. In Vanuatu, teachers noted that to support adaptation, climate change education should combine traditional knowledge with climate change science. Results from the mobile survey on the importance of teaching climate change were varied, with 98 percent of teachers in the Samoan sample prioritizing it, while only 48 percent in Vanuatu did, indicating that not all Pacific Island countries are responding to climate change education in the same way.

Teachers noted that it is important to obtain more resources where gaps exist and coordinate available teaching resources. Teachers need more resources across the education system, and they need to be able to access them easily in both rural and urban areas. Resources should be tangible and should complement the curriculum. In Samoa, 77 percent of teachers identified lack of resources as the biggest

problem with regard to teaching about climate change, noting that effective teaching requires resources to be made accessible and requires gaps to be filled.

Teachers observed that the topic of climate change is not yet effectively integrated into the existing curricula and that a coordinated approach is needed. Many teachers felt that it was important to fully integrate the topic of climate change into some subjects, but only include key teaching points in other subjects. Incorporating climate change into curricula is being attempted through various interventions, including as the "Learning about climate change the Pacific way: A guide for Pacific teachers" produced in 2013 by the Secretariat of the Pacific Community (SPC) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Teachers perceived that family and community education can help increase the effectiveness of climate change education, and reinforce at home what is learned in the classroom. Teachers noted the opportunities to localize teaching on climate change through broader community education.

Communities

The communities were concerned about the threats posed by climate change. Most communities, both those reached through the mobile survey results and those reached through the focus group discussions, were concerned about changes observed in weather patterns over time. In the focus groups, the largest threats to the community from climate change were perceived to be extreme weather and ongoing changes to weather patterns.

While many understand the potential issues and impacts of climate change, not everyone feels they can take action in response to it. The communities in the three countries had varying perceptions of the level of threat posed by climate change and their ability to take action in response to it. Communities in Fiji were most willing to take action (80 percent), followed by 73 percent in Vanuatu and 64 percent of people in Samoa. This illustrates that the perceived level of threat and ability to take actions from climate change is not the same everywhere in the Pacific.

Perceptions of the impacts of climate change vary between countries. Although the communities that participated in the surveys perceived that their understanding of climate change is quite high (84 percent of respondents in Samoa and 81 percent in Fiji) 9 percent of respondents in Samoa perceived tsunami as a climate change problem and 6 percent perceived earthquakes as such. In Fiji, the figures were 1 percent and 3 percent, respectively. Tsunamis and earthquakes were not seen as climate change problems in Vanuatu. This probably reflects a higher level of awareness of climate change causes and effects in Vanuatu than in Samoa and Fiji, which may be due to the Vanuatu sample population having participated in significant capacity-building on the subject of climate change. These findings once again indicate that it should not be assumed that there is an equal level of understanding and knowledge related to climate change throughout the Pacific.

Capacity-building and community-based educations are important for raising awareness of climate change impacts. "Soft" adaptation approaches, such as capacity building and education are important in the context of sustainable development. In contrast to "hard" (infrastructure) responses, "soft"' measures serve as a way to meet other community demands, including increased education and sustainable livelihoods.

Media

Technical terms and the use of acronyms by climate change agencies were identified as key problems in communicating about climate change. Many media respondents said they often found it difficult to turn press releases about climate change into compelling stories because the press releases contain too many acronyms and use too much scientific terminology, and also because they were not localized and did not tell personal stories. The media said that local stories create more traction because communities better relate to issues occurring locally, especially when such stories are also connected to what is happening globally.

Increased public education and awareness on the issue would help media officers produce more climate change stories. About half of the media respondents in Samoa and Fiji (55 percent) felt that public education and awareness-raising would be the best solution for communicating about climate change. They felt that such education is a key factor in improving public understanding of the issues and the ability to develop solutions. Thus, to improve media coverage of climate change it was recommended to first improve national education and awareness-raising about climate change.

Media officers want training on how to develop interesting and locally-relevant stories about climate change. In Vanuatu, 58 percent of the media respondents felt that media training and education would be the best solution to improving communication about climate change. In Fiji, around one-third of media respondent felt this way.

Improving channels of information between media outlets and climate change agencies is seen as crucial to improving media communication on the issue. The media felt that NGOs and climate change agencies focused exclusively on media outlets or channels that they were familiar with instead of being open to all media for promoting their campaigns. The data thus indicated that there is a necessity for better institutional linkages related to climate change information management and sharing.

Key Findings of Phase II

Analysis of the data gathered in Phase I of SPARCK showed that positive interaction and benefits could be generated by connecting teachers and communities through localized climate change education that takes into account local climate change issues and technical solutions for climate change adaptation. Accordingly, capacity-building training was carried out on a pilot basis with teachers and a community in Samoa.

The first day of this two-day training activity covered two main areas: the basic science of climate change (What to teach) and how to use existing resources for teaching about climate change (How to teach). The second day of the training activity involved a visit by teachers to a community on the coast that was experiencing the effects of climate change.

On the first day of the training, experts presented key aspects of climate education relevant to Samoa, as follows:

- Impacts on Samoa of climate change, according to findings of climate scientists.
- Risk, resilience and traditional knowledge
- Mangroves and adaptation
- Climate change in the Samoan curriculum
- Teacher resources for climate change education

Following this, teachers took part in activities through which they learned about in teaching-learning activities that they could use in the classroom. These included activities from the toolkit, "Learning about climate change the Pacific way – A guide for Pacific teachers", such as "Shrinking Islands", "Y-Charts", and "Consequence Wheel", and activities from the "Adventures of the Pacific Climate Crab" toolkit, such as the "El Niño and La Niña" exercise and the "Weather and Climate Exercise". A new activity, "How to plan a Climate Action Day", devised by Apidae, was also implemented. This activity was a way to get teachers thinking creatively about how to plan a day at their school on climate change teaching and learning activities.

On the second day, the training took place in Falease'ela on the southwest coast of the island of Upolu. Here, teachers interacted with local community members through the "Classroom to Community" activity and the "Community Photo Tour" activity. These activities enabled structured and positive conversation between teachers and community members on the climate change related issues facing the communities and means of addressing those issues, and how to best incorporate information about these issues/solutions into teaching and learning activities. The activities on Day 2 revealed that there are multiple opportunities for teachers and communities to learn from each other – from understanding local water filtration techniques to learning how to build and use escape routes during extreme weather and flooding.

The success of these activities strongly suggests that future interventions focused on basic training on the science of climate change, a need identified in Phase I of SPARCK, and collaborative workshops between teachers and community members would be valuable in increasing public awareness of climate change.

Key recommendations

Short-term

Provide training for teachers, media officers and communities

Teacher training on climate change should continue, focusing on the basic concepts as well as on how teachers can utilize teaching and learning resources in the classroom, especially as new resources and toolkits emerge.

Capacity building and training people in the media and in communities on climate change issues should be a priority so as to raise awareness of impacts and mitigation solutions.

Improve communication and collaboration

Climate change agencies should use fewer technical terms and acronyms, and should make communications relevant at the local level.

SPARCK showed that it is necessary for stakeholders to gain a better understanding of each other's roles, needs, and challenges in addressing climate change. Communication and collaboration between the major agencies also needs to be improved to ensure programmes are implemented in a coordinated way, rather than repeating similar exercises.

Medium-to long-term

Conduct research on perceptions of risk and vulnerability

There is a need for more information, research and analysis of perceptions in the Pacific regarding climate change responses. Further research is needed to better understand how people in each country perceive risk and vulnerability, and how this influences their willingness to act and perceptions of success.

Social and cultural aspects of information and communication technology for climate change initiatives should be better understood

Community perceptions, cultures, norms and environmental conditions should be considered when designing tools, methods and policies for adaptation to climate change. Local traditional responses to climate-related issues can be combined with technologies such as mobile phones. These technologies cannot simply be "plugged in"; however, they have to be used in conjunction with effective local interaction and face-to-face consultation. Engaging communities using these technologies should occur on a case-by-case basis, align with community needs, and fit within broader socio-cultural contexts.

Make climate change teaching-learning resources accessible to all

There is a need to decentralize and synergize climate change resources in both urban and rural areas. Resources (e.g. brochures, posters, publications and toolkits) should be made more easily accessible and available (e.g. via the school library) to communities and teachers.

Provide more comprehensive capacity building and education about climate change

To increase knowledge about climate change and resilience in communities across the Pacific, it is necessary to scale-up and replicate capacity-building activities such as those carried out in SPARCK. This includes organising regional strategic meetings on capacity building and education about climate change.

Combined training should be held for all stakeholders to identify best ways to collaborate and fill the knowledge gaps.

SPARCK showed that there are important interconnections between public understanding of climate change, the ability of the media to support this understanding, and broad education in schools and communities on climate change science and responses.

Develop information-sharing mandates

Government and non-government actors need to develop effective organizational and institutional mandates to improve information-sharing about climate change. In particular, the media sector needs to prioritize information sharing about climate change as part of their role in civil society and their responsibility to the public.

Background

Recent research findings in Samoa[1] suggest that communities in the Pacific have low levels of understanding of climate change and that there is much misunderstanding regarding the issue. While professionals working in the areas of climate change, meteorology and disaster risk reduction are highly informed and while leaders and policy makers can be expected to be somewhat informed, the general public has relatively little knowledge of the subject.

Bureaucracies in the Pacific are small and often limited in terms of capacity. As a result, communities will be on the front line in terms of managing the impacts of climate change. Community leaders, teachers and the media will be critical to building knowledge and guiding subsequent behaviour change. These groups therefore need tools to make well-informed decisions.

Social perceptions of risk, which influence behaviour, have been studied from various perspectives, including history, sociology, psychology, economics and political science. Studies have shown that there are certain factors that can influence risk perceptions and the decision-making that shapes behaviour change. These factors include: (1) interpretation of danger, understanding and knowledge of the cause,[2] (2) proximity, exposure, direct personal threat, and personal experiences with notable recent serious consequences,[3] (3) people's priorities,[4] (4) experimental factors[5] and (5) environmental values.[6]

The SPARCK project was initiated to improve understanding of climate change risk perceptions in the Pacific, to evaluate those perceptions of climate change and to identify opportunities for activities to

1 Tiatia, I. 2008. Impacts of Climate Change on the Island of Savaii, Report for UNESCO Apia Office for the Pacific States Möhlendick, 2010. Traditional Samoan Methods that can help to Adapt to Climate Change with a Focus on Food Security, Apia, UNESCO.

2 Bostrom, A. et al. 1994. What Do People Know About Climate Change? Mental Models. Risk Analysis, Vol. 14, No. 6, pp. 959-970.

3 Goltz, J. D., Russell, L. A., and Bourque, L. B. 1992. Initial Behavioural Response to a Rapid Onset Disaster: A Case Study of the October 1, 1987 Whitttier Narrows Earthquake. International Journal of Mass Emergencies and Disasters, Vol. 10, No.1, pp. 43-69

4 Lorenzoni, I.and Pidgeon, N.F. 2006. Public Views on Climate Change: European and USA Perspectives. Climatic Change Vol. 77, pp. 73–95.

5 Leiserowitz, A. 2006. Climate Change Risk Perception and Policy Preferences: The Role of Affect, Imagery, and Values, Environmental Science, Climate Change, Vol. 77, No. 1-2, pp. 45-72.

6 O'Connor, R. et al. 1999. Risk Perceptions, General Environmental Beliefs, and Willingness to Address Climate Change, Risk, Risk Analysis, Vol. 19 , No. 3 , pp. 461-471

increase resilience and mitigate the impacts of climate change. SPARCK also aimed to answer key questions around how teaching about climate change is perceived, how information about climate change is communicated at the community level, what communities perceive to be the greatest challenges in addressing climate change and the actions they propose in managing the impacts of climate change.

The SPARCK project examined the perceptions of teachers, communities and media officers in Samoa, Fiji and Vanuatu. Based on the findings regarding perceptions of risk and of education on climate change, the project implemented a pilot capacity-building activity to increase knowledge and capacity in managing the effects of climate change.

Previous efforts in climate change education

Various activities have been undertaken in the past in Samoa, Fiji and Vanuatu to increase understanding and awareness of climate change. These include training workshops for educators, the production of teachers' resource kits and guides, and the implementation of community training and awareness-raising programmes.

Samoa

A resource kit was developed in 2008 to assist teachers in teaching about climate change and other topics such as waste management and water resource management. The resource kit provided instructional materials for teachers of Years 7-10. Hard copies of this resource kit were distributed to all the schools in Samoa.

Another resource for teachers and students in Samoa is the Environment Resource Guide (2008) which describes various environmental issues, including climate change. This guide includes fact sheets, activities and lesson plans, and provides connections to subjects in the curriculum such as science, social science, geography, English and music. The Ministry of Education, Sports and Culture (MESC) was involved in preparing this guide and teachers were trained in how to use it.

In 2009, a Disaster Resource Kit for teachers and students was developed for early childhood, primary and secondary levels, and teachers were trained on how to use the kit. Hard copies and electronic versions (on CD) were given to the Ministry of Education Sports and Culture to distribute to all schools.

Samoa has been working under the Secretariat of the Pacific Community (SPC) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) Coping with Climate Change in the Pacific Island Region CCCPIR programme, which aims to strengthen the capacities of Pacific member countries and regional organizations to cope with the impacts of climate change.

The World Bank funded the development of a resource titled "Disaster Risk Modules: Teacher's Resource Kit" (2009), which describes various disaster-related hazards and risks, including those that are a result of climate change.

Samoa has annual school, zone and national science competitions. In recent years the theme of the science competition has been climate change. This competition aims to encourage students to learn about climate change and to encourage them to consider a career in climate science.

Fiji

The Ministry of Education, National Heritage, Culture and Arts (hereinafter referred to as the Ministry of Education) in Fiji began the process of incorporating climate change into school curricula in 2011. Fiji's Education Sector Strategic Plan (2012-2014) seeks to provide a "holistic and empowering education system that enables all children to realise and appreciate fully their inheritance and potential contributing to peaceful and sustainable national development". Fiji's National Climate Change Policy, endorsed in 2012, sets out national positions and priorities with respect to climate change, and Objective 4 stipulates that education and training will "integrate climate change into school curricula, tertiary courses, and vocational, non-formal education and training programmes".

In March 2014, a consultation was held by the Ministry of Education in Fiji on the National Curriculum Framework. The feedback from this consultation will inform the trialling of a new curriculum in schools, beginning in 2015. The revised curriculum integrates the topics of climate change and disaster risk management into basic science and social science syllabi for Year 1 and Year 2 and integrates these topics into all syllabi for years 3 to 13.

The Fiji national curriculum consultation process has been supported by the CCCPIR programme, which is being implemented by the SPC and GIZ. The Pacific Centre for Environment and Sustainable Development of the University of the South Pacific also contributed to syllabus development.

In addition to developing a strategy, several key achievements have been made under the Education Sector Strategic Plan including:

- The Curriculum Development Unit is chairing a new national sub-working group on climate change training and education under the Climate Change Unit of the Ministry of Foreign Affairs and Immigration.
- Through a series of workshops, curriculum development officers have strengthened content and learning outcomes on climate change and disaster risk management and have integrated them into school subjects: basic and social science, geography, agriculture, industrial arts and home economics. The key concepts will be introduced in classes 7 and 8.
- A review of existing resources identified the children's storybook "Pou and Miri" as a useful teaching resource. The book was given to the Ministry of Education to distribute to all Fijian primary schools (in English and in Vosa VakaViti).
- The Ministry of iTaukei Affairs has developed a climate change glossary in Vosa VakaViti (the iTaukei language) in partnership with Ministry of Foreign Affairs and International Cooperation and the Forestry Department.
- The Ministry of Education and NatureFiji-MareqetiViti have developed an alphabet poster featuring native animals and plants. The poster was distributed to primary schools.
- SPC and GIZ, in cooperation with the South Pacific Regional Environment Programme (SPREP), have developed a picture-based outreach toolkit on climate change, and have trained teachers and lecturers in its use.

Vanuatu

The Curriculum Development Unit of the Ministry of Education is conducting an official review of the national curriculum, under the Vanuatu Education Road Map that began in 2009, with the support of SPC, GIZ, and the National Advisory Board on Climate Change and Disaster Risk Reduction.

Vanuatu is one of the pilot countries for the CCCPIR programme, which aims to strengthen the capacities of Pacific member countries and regional organizations to cope with the impacts of climate change. The programme's education-related objectives in Vanuatu are as follows:

- Incorporate relevant climate change elements into the Vanuatu education and training policies, plans, strategies and frameworks (2012 to 2015).
- Train formal and non-formal teachers on climate change topics and practical applications during in-service and pre-service trainings (2012 to 2013).
- Integrate climate change elements consistently and appropriately into formal and non-formal curriculums across all relevant subjects at all levels (2011 to 2013).
- Develop national steering, coordination and sharing structures for formal and non-formal climate change education (2012).
- Develop and adapt teaching materials and resources on climate change, tailored to local contexts, and effectively applicable in the formal and non-formal sectors (2013 to 2014).
- Implement enhanced CCE on a pilot-site basis in selected Rural Training Centres and schools (2014).

Another climate change education activity in Vanuatu is the Climate Zone, a televised educational "game show" in which students in Year 11 from all six provinces of Vanuatu compete to demonstrate their knowledge on the science, impacts and adaptation solutions to climate change. The initiative, a partnership between the SPC and GIZ Vanuatu Climate Project, the Ministry of Education and the University of the South Pacific (through the Faculty of Science, Technology and Environment and the Pacific Centre for Environment and Sustainable Development), has run successfully since 2012.

Pacific

Several agencies are assisting the media in the Pacific regarding information about the issues relating to climate change. This includes SPREP's various capacity building initiatives and its "Pacific Media Climate Change Survey" as well as the ongoing efforts of the Pacific Media Assistance Scheme (PACMAS).

The **SPARCK** Project

Pacific Island countries are at the forefront of the battle against climate change, due to their high levels of exposure to extreme climate events. Successful climate change adaptation and disaster risk management require an understanding of how people perceive climate change problems, how communities respond to extreme climate events and how local resilience is created.

Aims

UNESCO initiated the Sharing Perceptions of Adaption, Resilience and Climate Knowledge (SPARCK) project to investigate Pacific Islanders' perceptions of climate change and their decision-making and adaptive capacities, focusing on three groups – high school teachers, communities living in and around conservation areas, and media officers – in three countries: Samoa, Fiji and Vanuatu.

The SPARCK project aimed to increase understanding of how to better prepare teachers to integrate content on climate change within formal school curricula, how community decision-making influences the management of the effects of climate change, and how to improve the capacity of the media to communicate about climate change issues effectively.

The project aimed to be a pilot programme for the region by combining in-person focus groups with mobile surveys and online interaction (on Facebook); methods that complement each other for effective research and engagement.

Timeline

The SPARCK project was implemented between January and September 2013 in two phases (see Table 1).

Phase I involved the collection of data in Samoa, Fiji and Vanuatu through focus groups and an innovative mobile phone survey, the first for climate change in the Pacific. Phase II was a pilot capacity-building activity implemented in Samoa. The training programme was based on information gathered and lessons learned during Phase I.

Table 1: Timeline and activities of the SPARCK project

Phase I Focus Group and Mobile Survey *January-July*	• Planning and method development • Data collection through focus groups in Samoa, Fiji and Vanuatu with three target groups: high school teachers, communities living near conversation areas and media officers. • Data collection via a mobile phone survey. This involved the collection of answers to 11 or 12 short questions on perceptions of climate change via SMS. • Development of a Facebook page for SPARCK project awareness-raising, promotion and online discussion. • Incorporation of key findings from all three countries to develop a capacity-building training programme on climate change. • Capacity-building in Samoa with high school teachers and community members.
Phase II Capacity Building *September*	• Incorporation of key findings from all three countries to develop a capacity-building training programme on climate change. • Capacity-building in Samoa with high school teachers and community members.

Phase I

Phase I included interactive focus groups and a mobile phone survey. The focus groups and surveys were organized for all three groups – teachers, communities and the media – in the three countries.

Focus groups

The focus groups involved interactive discussions regarding problems associated with climate change and solutions for increasing resilience and mitigating against climate change, and a unique "photo sorting" activity that allowed respondents to answer questions by sorting photos of climate events, solutions, societal issues and technologies on specially-constructed poster boards.

Mobile phone survey

The mobile phone survey was conducted to collect information to complement the data collected from the focus groups. The survey aimed to gain a wider selection of responses than possible with the focus groups and to gather quantitative data on perceptions related to climate change.

Mobile technologies are considered to be useful tools not only for getting information out to communities but for collecting information. For example, although "core to periphery" mobile phone warning systems exist in the Pacific, for example for tsunami warning alerts, such programmes generally do not source information "back in" from community members[7]. The mobile phone survey therefore aimed to test the capacity of the context for information gathering via this technology. In particular, the mobile phone survey offered an opportunity to explore the opportunities and barriers in using this form of technology as an approach to sharing information for disaster risk reduction and climate change adaptation. The mobile phone surveys for the teachers and media officers had 12 questions and those for the communities had 11 questions.

SPARCK Facebook page

A Facebook page was developed to create awareness of the SPARCK project and provide a platform for awareness-raising and further discussion on climate change issues.

The Facebook page was used as a tool for promotion of the project's activities and for engagement and interaction. It was an "open" group that anyone could join not just SPARCK focus group or mobile phone survey participants. The Facebook page had received 250 "likes" between its launch in February 2013 and the end of the project in October 2013. A person was designated for managing the page, to ensure the page was current and relevant. This seemed to keep users interested and engaged. Updates were posted regularly, including general information about climate change in the Pacific (to spark interaction and conversations), reminders about focus group session times and locations, and announcements of mobile phone survey winners. The page allowed people to see their friends and colleagues (which in the Pacific context of small communities is comparable to "word of mouth"), and to comment and share pictures. A screenshot of the Facebook page can be found in Appendix 5 of this report.

Phase II

Phase II involved a capacity building activity for two of the target groups: teachers and communities. It was conducted in Samoa. This training drew on the key findings and conclusions identified in Phase I to provide relevant information for teachers and communities. Based on the lessons learned from the training, a teacher toolkit was developed. It is expected that this training resource will extend the benefits of the SPARCK project for several years to come.

7 Bumpus, A.G. (in review). Using mobile phones to improve climate change project monitoring and evaluation in Fiji and Samoa: A preliminary study of the barriers and opportunities for the use of information and communication technologies for climate change project monitoring and evaluation in Fiji.

Phase I Methods

General approach

In consultation with the UNESCO Apia office, Apidae Development Innovations[8] developed specific methods for the SPARCK project, aiming to be innovative from the outset. Given the exploratory nature of the work and the dearth of similar studies of perceptions of climate change in the Pacific, pioneering methods were created, seeking to enhance engagement and interaction with target groups and identify unique ways for the communication of information with multiple stakeholders.

Country selection

To determine which three countries should be selected for the SPARCK project, a list of criteria was developed.

The criteria were:

- International agency partner presence in respective countries (i.e. United Nations, SPREP, Global Climate Change Alliance).
- Mobile network coverage (ability to run the mobile survey and reach target groups).
- Suitable country context (e.g. climate risk profile, climate fatigue, data gaps regarding climate change perceptions)
- Previous exposure to education relating to climate change
- Logistical suitability (e.g. accessible in a short time frame)

Based on these criteria, it was determined that the three focus countries should be Samoa, Fiji and Vanuatu.

Samoa – Other than meeting the above criteria, Samoa was selected as a focus country because: (1) The UNESCO Office for the Pacific States is based in Apia. This meant there was good capacity to carry out a pilot initiative that would be used to derive lessons learned and key challenges; (2) the Digicel network in Samoa also covers the other two countries, allowing the mobile phone survey to be managed through the same network; (3) Apidae had existing contacts and relationships with the Ministry of Natural Resources and Environment in Samoa and with SPREP, making it easier to establish partnerships to carry out the project.

Fiji –Reasons for selecting Fiji as a focus country included: (1) Strong potential to run the mobile survey on both Digicel and Vodafone networks and through existing Apidae contacts in Fiji, including with the Ministry of Environment; (2) several conservation areas had been previously identified in Fiji, making it possible to easily organize a community focus group; (3) the geographic proximity to Samoa and ease of transport between Samoa and Fiji facilitated coordination for the UNESCO Apia office.

8 From here forward referred to as Apidae.

Vanuatu – Vanuatu was selected as a focus country because of (1) the potential to link to the Marine Protected Areas (MPAs) for community research; (2) the possibility to run the mobile survey on the Digicel network and (3) good UNESCO contacts in the country.

Thus, countries from Melanesia and Polynesia were included in the SPARCK project. Micronesia was not included due to travel budget constraints and the lack of mobile coverage in-many Micronesian countries.

Focus groups

Separate focus groups were held with each of the three sets of participants (teachers, communities and media) in Samoa, Fiji and Vanuatu. The focus groups, which were structured informally, discussed key issues and ideas associated with climate change relevant to each target group.

Purpose of the focus groups

- To better understand perceptions of climate change across target sectors: the perceptions of high school teachers related to climate change education; the perceptions of the media in communicating about climate change; and how the communities' perceptions influence their ability to respond and adapt to climate change.
- To better understand some of the gaps and weaknesses in climate change education and communication, as well as in community-level adaptation and how these gaps relate to, or are influenced by, climate change perceptions.

Anticipated outcomes

Qualitative data that can be used to:

- Understand the perceptions of teachers, communities living near conservation areas and media officers with regard to climate change.
- Compare data for target groups between countries.
- Develop short – and medium-term capacity-building activities.
- Provide recommendations for building capacity relating to climate change.

Focus group activities

The focus group activities elicited participants' perceptions, opinions and perspectives. To facilitate discussion, interactive activities were developed that would allow participants to be involved and express their views without necessarily having to speak out in front of a large group.

Many focus groups (in particular those for the communities) were carried out in the local language and translated into English in real time via a translator. In other cases, English was used where participants were comfortable interacting and speaking in English.

Two activities were carried out for all of the target groups and they involved the same format and order. These were the "Identifying key problems and solutions"' activity and the "Q-sort" activity.

Examples are given below regarding the focus groups carried out with teachers. The activities for the communities and media officers were the same, except for changes in the wording of the statements and questions asked which were specific to the target group.

Activity 1: Identifying key problems and solutions

Purpose of the activity

To understand, from the perspective of teachers, what they perceive as the problems and solutions related to teaching about climate change, and what they want to learn more about to improve their teaching on the subject.

This activity had two parts; Part 1 involved getting teachers to identify problems and solutions related to teaching about climate change, and Part 2 asked teachers to "vote" to identify their more specific concerns and views relating to climate change education.

How to identify key problems and solutions

FACILITATOR | Please write down the biggest PROBLEM for you in teaching about climate change. Write it on your sticky-note pad, and then post it on the board on the PROBLEM side. Then, on a different colour sticky-note, please write down the biggest SOLUTION for teachers in teaching climate change. Write on your sticky-note, and then post it on the board on the SOLUTION side."

Part 1 – Identifying problems and solutions in teaching about climate change

A line was drawn down on a white board, dividing it into two, and the two sides were given headings: Problems and Solutions. The participants were asked to write down on a piece of paper the biggest PROBLEM for them in teaching about climate change, and to place it up on a board under the heading "Problems." Participants were then asked to write down the biggest SOLUTION in teaching about climate change, and to place it up on a board under the heading "Solutions".

Once all the notes/ideas were on the board, the individual notes were read out to the participants and grouped into key categories. For example, "curriculum", "resources", "scientific information", and "training". The grouping depended upon what was written down by the participants and the notes were arranged into key themes from the topics chosen.

A brief discussion of the identified problems and solutions then took place based around the following questions:

- Why are these issues important?
- What are the main challenges in achieving these solutions?
- What topics relating to climate change do you teach about (climate science, politics, impacts, solutions)? Why?

Part 2: Voting

Next, the participants were asked to take a red sticker and place it next to the word/phrase they perceived ("voted") to be most important problem. They then placed green stickers next to the word/phrase they perceived to be the most important solution. Finally, they placed orange stickers next to the word/phrase they wanted to learn more about (see Photo 1).

"Voting" for the most important issues

FACILITATOR | Please take the red sticker and place it next to the word/phrase you think is the most important problem for teaching about climate change i.e. "This problem is most important for me."

Then, we would like you to take the green sticker and place it next to the word/phrase you think is the most important solution for teaching about climate change.

Finally, we would like you to take the orange sticker and place it next to the word/phrase you would like to learn more about for your teaching on climate change.

Photo 1: Teachers in Fiji voting in the "Identifying key problems and solutions" activity

This was an important exercise as it provided an opportunity for each participant to focus on the key issues.

Asking participants to identify what they felt personally was the biggest problem/solution (in Part 1), and then asking them to vote based on the responses of the group as a whole (Part 2) allowed for greater clarity. In particular, it allowed the participants to be more specific about what they perceived to be the problems and solutions relating to teaching about climate change at their schools.

The placing of the orange stickers enabled the participants to identify what they would like to learn more about. This allowed the researchers to identify where and how teachers would most like to build their capacity. The method focused on the needs of teachers and how this learning could potentially be applied to the capacity-building activity in Phase II of the SPARCK project.

A discussion was then generated among the participants by asking the following questions:

- How often do you teach/talk with your students about climate change? Do you think this is too much or too little?
- At what age should students be taught about climate change?
- In which subjects should climate change be taught?
- Where do you get your information from to teach about climate change? What kind of information do you usually get?
- Do you think your students are interested in climate change?
- What would help you to give your students more information about climate change?
- Do you think climate change should be a bigger part of the curriculum?

- Why do you feel this topic/issue is important to teach students about?
- What are some of the challenges you face in teaching about climate change? (e.g. insufficient information, terminology too technical, science and jargon complex, lack of opportunities to talk about climate change in curriculum, lack of knowledge to make climate change issues relevant and interesting for students.)
- What would help you to teach your students about climate change?
- How would you like to learn more about this topic/issue (e.g. through manuals, useful websites, presentations, reports, conferences, toolkits, Facebook sites)?

Activity 2: Q-sort

Purpose of the activity

To generate an informal discussion on various climate change related topics such as the economy, culture, health and technology, through the use of photos. Participants were given photos and were asked to place the photos on a grid, thereby ranking the photos and indicating their degree of agreement with what was represented in the photos (i.e. most agree, most disagree).[9]

Photo 2, 3: Teachers in Vanuatu work on Q-sort photo grid used in focus group activity.

9 For an example of Q-Sort see: Robbins, P. and Krueger, R., 2000. Beyond bias? The promise and limits of Q method in human geography. *The Professional Geographer*, Vol. 52, pp. 636–648.; Green, R. 2005. Community perceptions of environmental and social change and tourism development on the island of Koh Samui, Thailand. *Journal of Environmental Psychology,* Vol. 25, pp. 37–56.

Photo-sorting

Participants were split into two or three groups depending on the number of participants, and the number of photo-ranking grids. The groups were given a stack of photos relevant to their country, a photo-sorting grid (see Photo 2) and one statement.

Photo 2: Q-sort photo grid used in focus group activity.

The photos were images of climate change problems and solutions, and representations of culture, education, health and technology. A description was written on the back of each photo.

Each group was asked to collectively Q-sort the photos along the agree/disagree continuum, ranking them in terms of their perceived agreement or disagreement with regard to the statement they had been given.[10] They were asked to place photos both horizontally and vertically to indicate degree of agreement/disagreement (see Photo 3). An example was shown before they started.

Some examples of the statements used in the teacher focus groups were:

- I teach my students frequently about this climate change issue (Agree/Disagree).
- Teaching this will help students better understand climate change (Agree/Disagree).
- I would like to improve my skills in teaching this climate change issue (Agree/Disagree).

Although this method did not produce quantitative results, it was a useful and fun in terms of opening up the discussion with participants.

Explaining the Q-Sort exercise

FACILITATOR | We will give each group a stack of photos and one statement. As a group, we would like you to look at each photo and ask yourselves: do you agree or disagree with the statement as it relates to the photo? Place the photos in the boxes on the grid, along the row according to whether you agree or disagree.

There are no right or wrong answers, you don't have to use all the photos, and if you have an idea that is not on the photo, you can write it on the sticky-note and stick it on the board. This is meant to be a kind of game, so it is light hearted and quite fast!

Photo 4: Community members in Fiji engaged in photo sorting activity

10 This was not a strict Q-Sort activity with individuals responding. As such, we did not use statistical analyses on the Q-Sort results. The method was used as a way of (1) encouraging participation from all members and (2) opening up discussion based on visual images.

Reporting back and discussion

Once the groups had finished the photo-sorting activity they were each given 3 to 5 minutes to report back on how and why they had sorted the photos in response to the statement they were given.

Additional questions were discussed (if they had not been addressed previously) such as:

- Is there too much/too little climate change in the curriculum?
- Does your school/the curriculum help you to teach climate change?
- What resources would help you to teach climate change? Textbooks, teacher training, online resources, videos etc.? What materials exist and which are most useful? Why? Is there enough/too much?
- Do you feel confident to use the resources you have? What support would help you?
- Where do you get your climate change information? (e.g. The media, Ministry of Education, SPREP).

Final discussion and wrap up

To close the focus group, a wrap up discussion was held to ensure that no points or questions had been missed.

Questions that were asked to generate discussion included:

- What did you think of these exercises? Useful? Different?
- Are there any topics or stories around these specific issues, or climate change in general, that we did not cover?
- Has there been anything surprising from this group discussion today?
- Has the discussion resulted in any new ideas or ways of approaching climate change?

At this time participants were invited to participate in the mobile phone survey, and the next stage of the project (Phase II) was explained. The participants were also reminded to join the conversation on the Facebook page.

Finally, the participants (in the teacher and media focus groups only) were asked to complete a short evaluation of the focus group by writing comments on a sticky-note, and placing the notes on the wall under the heading "Evaluation". Evaluations were not solicited in the community focus groups due to time constraints and the inability to translate the feedback as it was coming in. The feedback from the teacher and media focus groups can be found in Appendix 2.

Feedback from participants

The methods and activities used in the focus groups received very positive feedback from participants in all countries. Examples of the comments are shown below.

> *Good use of stickers and coloured paper. Interesting how the photos are attached on the big white paper and how problems are written in different/separate issues from the teachers. Very clear and important matters discussed."* (Teacher, Samoa)

> *"The exercises were great to get attendee participation. The workshop provided a good forum for the media of Vanuatu to discuss climate change."* (Media, Vanuatu)

> *"Workshop was great! Learned a lot because of how the information was given out. The methods used for this session were simple but motivating."* (Teacher, Fiji)

According to the feedback, the activities and methods used in the focus groups were very useful in soliciting input from participants. This overcame one of the key challenges with any focus group, which is encouraging participants to openly share their ideas and opinions.

Initial discussions were sometimes slow to progress (particularly with some community focus groups where only a few people spoke for the group; this was usually the men in the group, though women were also present). Once participants were up and moving around (for example for placing sticky-notes or voting on the board), however, they became more engaged and participated in the conversations. The use of activity and moving around was purposely built into the methods to encourage participation and help people feel comfortable with the session.

It was noted that when working with communities where elders are involved, it is important to create ways for everyone to participate appropriately. Activities that require a lot of speaking and writing can sometimes exclude certain people. The feedback received was that the activities used in the focus groups were very inclusive and allowed for all ages to participate. One community member from Navutulevu in Fiji commented, "The way you did the activities today was really good. Even the older ladies who don't have any education could take part."

Feedback from the media and teachers indicated that participants would have preferred longer sessions. In most cases the focus groups ran for between 2 and 2.5 hours. The facilitators were careful to keep the focus groups to the allotted time, especially for some of focus group sessions that occurred in the late

afternoon or early evening (two sessions were held with teachers from 5 to 7 PM). During these later sessions, participants seemed to lose focus toward the end, even though they expressed they wanted sessions to last longer.

Limitations of the focus group activities

The photo sorting activity did not produce as much useful data as anticipated. This is in line with comments obtained from practitioners of this method, who highlight its usefulness as a tool to open up discussion rather than to collect data[11]. While the photo-sorting activity did engage participants, and they had very vigorous discussions among themselves, it was not clear, however, whether the groups understood the idea behind the activity. In many cases, though instructed that they did not have to use all photos, participants filled the entire grid with photos but they were not clear on whether they "agreed or disagreed" based on the way they had presented the photos. It is recommended that for future applications of this method researchers use a simple photo-sorting grid with only one horizontal line, so participants would be required to choose between the photos they are given and there is less confusion.

Mobile phone survey

Purpose

A significant innovation in the SPARCK project was the use of a mobile phone survey to gather data from a wider range of people in the targeted sets of people than possible in the focus groups alone. For example, the teacher focus group in Samoa could only obtain data from 30 high school teachers in Apia, but the mobile phone survey was open to all teachers in Samoa.

Using the mobile phone survey was also a good opportunity to test this method of data collection given that:

- No mobile phone surveys were known to have ever been conducted in the Pacific on the topic of climate change.
- The mobile phone survey questions were focused on the perceptions of climate change (rather than being knowledge-based questions); they were not overly technical or complex, and thus could be asked in this type of format.
- Mobile phone interaction allows for faster and, potentially, more responsive interactions with target groups.

Formats

The mobile survey was run in two formats: Short Message Service (SMS) and Unstructured Supplementary Services Data (USSD).

In the case of the SMS survey, the questions were sent out by text messages in a simple two-way (sending and receiving) system. Each question had to be answered before the respondent received the

11 Discussions carried out by Dr Adam Bumpus with participants in Q-Sort methodology session, Association of American Geographers Annual Meeting, Los Angeles, March 2013.

next question. With USSD, which is a menu-based system, the entire survey opened up as soon as the user entered a prompt to begin. There was then limited time to complete all survey questions before the survey timed out. Non-web based interaction was chosen because of the cost of accessing the Internet in the target countries and because although some participants had "smart" (Internet-enabled) phones, most used, and were comfortable with, standard mobile phones.

The mobile phone survey used Apidae technology applications and was powered by Mobimedia, a mobile solutions company running premium SMS services in the region. The mobile survey was carried out on the Digicel network in Samoa, Fiji and Vanuatu in collaboration with Mobimedia. Digicel was selected because it had the best coverage in Samoa and Vanuatu. Apidae also engaged Vodafone Fiji to run the survey on their network in Fiji given their higher coverage in the country.

Table 2: Mobile network providers and survey types across all three SPARCK countries

Country	Network Provider	Survey type
Samoa	Digicel	SMS
Fiji	Vodafone	USSD
	Digicel	SMS
Vanuatu	Digicel	SMS

Participation in the survey was completely free. As an incentive, participants in the surveys (teachers, communities and media) were entered into a draw to win mobile phone credit upon successfully completing the survey.

Development and implementation

The mobile phone survey's development and implementation involved seven main steps. These steps were replicated across Samoa, Fiji and Vanuatu.

- **Question development**

A significant amount of time was spent at the outset of the project to develop and refine the survey questions. Because the mobile phone survey had to be short, not only in the length of the question itself but in the total amount of questions, it was important that the questions be very clear and concise. An additional requirement was that the survey questions be translated, as the surveys were run in both the local language and English. The questions had to be refined and edited several times to ensure they fit within the 155 character limit (the SMS limit, and for conciseness on USSD) and to ensure they were easily understandable by survey users.

The focus topics for the mobile phone survey questions were: climate change knowledge (e.g. What is the biggest climate change problem for Vanuatu?), perceptions of personal risk and vulnerability (e.g. How concerned are you about climate change?), resilience or ability to act (e.g. Do you think we can do anything about climate change?) and capacity building (e.g. What would be the best thing to help build capacity in the Fijian media?).

Each of the sets of people were asked different questions, apart from a few core questions that were retained for all groups. See Appendix 3 for an example of the mobile phone survey questions.

- **Promotion of the survey**

Promotion of the mobile phone survey (selection of participants) was achieved through poster distribution via key ministries, and through the SPARCK Facebook page. In addition, focus group participants were sent emails and SMS to encourage them to participate in the mobile survey.

Posters with information on how to join the survey and enter to win mobile credit were handed out to Education Ministries in Samoa, Fiji and Vanuatu, and were distributed to communities via the Ministry of Environment in Fiji. Posters were also handed out in all focus groups. In addition, posters were hand-delivered to media outlets in Fiji and Vanuatu, and a media pack was provided at the SPARCK launch event in Samoa (see Appendix 4 for an example of the posters). The promotion via the SPARCK Facebook page informed readers of the survey but did not provide the codes for entering the survey, as this could have potentially skewed the survey results if people completing the survey were not members of the target groups: teachers, people living near conservation areas and media officers.

- **Mobile phone survey launch**

The mobile phone survey was launched shortly before or after each focus group. In many cases the survey had a "registration" phase during which participants could "text in" to register their number and would then receive notification once the survey opened.

- **Data collection**

Once the survey was launched, it was open for approximately two weeks. In some cases, if responses were still coming in, the survey was left open longer. During this time participants received a mid-point and final closing reminder to complete the survey, if they had begun answering questions but failed to complete all of them. Once they completed the survey, they received a notification to thank them and to say that they were now entered in the competition to win mobile credit. All of the data collected from the survey was kept strictly confidential, and none of the numbers were used for any purpose other than analysis related to the survey.

Mobile phone survey response rates

The response rates for the mobile phone survey varied greatly across groups and countries (see Table 3). In all three countries, however, responses from media officers were lower than for other groups. The highest response rate was 75 respondents (community survey in Fiji) and the lowest was 5 (media survey in Fiji). It should be noted that these numbers reflect data that was actually used. While responses were greater than this in certain cases, some of the data had to be removed because respondents answered the media and the community survey. Only the responses to the initial survey were counted.

Table 3: Mobile phone survey response rates

Survey response rates

	Teacher	Community	Media
Samoa	55	45	10
Fiji	6	75	5
Vanuatu	25	11	12

Lower numbers of responses to the mobile phone survey for a particular population group reflected lower participation in the focus groups. The participants in the focus groups were asked to "spread the word" about the survey and pass along the posters they were given to their colleagues or communities. Fewer participants in the focus groups therefore meant that fewer posters were distributed. This is likely to have led to lower awareness about the survey. The variation in the response rates illustrates the importance of having a local champion and promoter for the use of mobile phones for collecting data.

Where there were low levels of responses to the mobile phone survey, the results cannot be said to be representative of the whole population group. Those results should be seen as a snapshot of a few individuals' perceptions on climate change and should be read in conjunction with the data from the focus group.

- **Mobile data aggregation and analysis**

Data was aggregated via a Graphical User Interface (GUI) that allowed for tracking of responses as they were received and compiling of information, such as the mobile number, the date and time of the response, the number of incorrect attempts made, and any errors in keying in responses. This information was then extracted from the GUI and sent to Apidae.

Data analysis began only when the survey was closed. Statistical analyses were only carried out in cases where there were sufficient data to be analysed under conditions of statistical significance. For target groups with low responses, simple descriptive statistics were used in the reports.

- **Data verification**

Once the mobile survey had closed (and responses were no longer accepted), the data was aggregated for each target group. It was a requirement of the competition that respondents complete the survey in its entirety to be entered to win the mobile credit, so the data was verified to ensure each question had been answered. A statistical method involving calculating the square root of the sample size was employed to determine the sample size for verification of the data. For example, if 25 people responded to the survey, then five of these people were randomly selected to be verified. Each of the five respondents were called on the telephone and asked the survey questions again. Additional questions were asked to verify that they were indeed a teacher, media officer or member of the targeted community, and that they had themselves answered the survey.

- **Selection of mobile phone survey winners**

Once the data was verified, a final single respondent was selected randomly from each of the three target groups in all three countries, and the winners were contacted. The winners were invited to have their name and photo posted on the Facebook page. There were nine winners in total and each was awarded AUD 50 in mobile phone credit.

Opportunities of the mobile phone survey

In some countries and for some target groups, the mobile phone survey allowed the researchers to reach a larger number of the target group than was possible in the focus groups. For example, in Fiji the community focus group had only 11 participants, all of whom were from Navutulevu, but the mobile phone survey had 75 people participants, from communities across Fiji.

The fact that people responded to the survey demonstrates that an opportunity exists to use mobile phones as a tool for data collection. While the SPARCK survey focused on receiving data by simply sending out questions, other survey methods could be used, including turning surveys into games and sending information back to users, such as weather updates for communities, or climate change facts for teachers.

There was a low level of participation in the mobile survey from the media in all three countries and from teachers in Fiji, but useful data was, nonetheless, acquired on the perceptions of the three target groups. The high quality of the data collected through the mobile phone survey allowed for an additional layer of analysis that would not have been possible with the focus group data alone and resulted in important conclusions regarding climate change perceptions.

Photo 5: Dr Denis Chang Seng from UNESCO presents a teacher from Apia with a certificate as the winner of the SPARCK mobile survey for teachers in Samoa.

Challenges of the mobile phone survey

A major challenge of the mobile phone survey was the low response rates and loss of data in cases where responses did not match the questions or were jumbled. It should be noted, however, that this outcome was anticipated as being a moderate to high risk for the project.

Several factors contributed to the low response rates and loss of data. First, although significant time was spent troubleshooting the technology to ensure that the surveys were working properly in country, some technical issues affected the survey. In Samoa, the pilot country for the mobile phone survey, respondents received error messages the first few days the survey was open. Additionally, the survey did not "lock out" participants as it was meant to. Thus, many participants answered the surveys for more than one group, resulting in their data being discarded (cf. data verification step above).

Second, there was some confusion on how to use the survey. The "code" for beginning the survey seemed to confuse some people. For example when the posters instructed "Text TEACH to 208" or "Text MEDIA to 208" many people incorrectly texted the key word, so the survey was not prompted to begin. To address this issue, the instructions were modified so that texting the keyword "START" would launch the survey. This resulted in fewer errors. The prompts were also changed as the implementation team worked with technology providers in country to respond to responses from local people.

Another example of confusion was in response to the instruction to "Text 1, 2, 3 etc. to indicate your answer." Many respondents typed out the response in its entirety instead of just texting the corresponding number (1, 2 or 3) for their answer. This prevented the survey from prompting the next question, so the respondent was unable to complete the survey.

It was therefore concluded that simple prompts and instructions are necessary in order for people to understand how to interact with the survey and that the prompts and instructions must suit the local contexts.

In addition, it was concluded that having a local champion for a survey is a key to its success. In instances where there was support from a key individual in a ministry or local organization, response rates were higher. This local support and promotion made a significant difference because people were reminded to complete the survey, posters were distributed and there was local ownership over the success of the survey.

In sum, it was concluded that a mobile phone survey can be a useful data collection tool when the technology works properly and when instructions and prompts are clear and locally relevant, and it was concluded that such surveys are most successful when implemented with the support of local champions and when they are supported by other forms of communication, such as local interaction in face-to-face focus groups and Facebook. Furthermore, it is also important to collect data through other means to complement the phone method. Having the "safety net" method of the focus group ensured SPARCK could mitigate loss of data. Another important consideration when using mobile phone surveys is to ensure that the researchers have direct access to programmers or technical support staff who can resolve issues quickly. It is recommended that, where possible, this technology be developed and implemented "in house" or by organizations who have experience running a data collection survey and are able to troubleshoot with adequate lead time.

Phase I Key Findings

The results presented here are the summaries of reports of the results for each country (Samoa, Fiji and Vanuatu).

Samoa

Teachers

Teachers in Samoa perceived climate change as an important issue and one worth teaching about, but they felt constrained by a lack of training on the issue and insufficient resources to make it easy to communicate content on climate change in the local context. The teachers perceived that localization of climate change issues through field trips, and broader family and community education on climate change were the best solutions to help improve teaching about climate change in Samoa, particularly in terms of helping students understand how the issue relates to them. Teachers also identified a need for more development of the curriculum in areas relevant to climate change. They felt that emphasis should be placed on engaging students early on and fully integrating the topic of climate change into a few key subjects, with key teaching points to link and reinforce this content in other subjects.

Communities

Focus groups were held with communities in two locations in Samoa: Sapapali'i (a coastal community with an existing climate change project) and Ao'po (a community near a conservation area without a climate change project). Community members in these areas perceived the biggest local climate change issue to be extreme meteorological events and changes in weather, such as increasing heat.

In both Sapapali'i and A'opo, concern was expressed over problems that were not directly identified as climate change issues. Discussion centred on general livelihood concerns and concerns about agriculture, in particular over the use of chemicals on the land. Both communities had received international assistance in the past (water tanks in Sapapali'i, and general development assistance in A'opo), which meant that the communities saw financial assistance as important.

Two-thirds of community mobile phone survey respondents believed that climate change was human-induced or partly human-induced and partly natural, indicating that there was a general understanding that human activity has an impact on the climate. These mobile phone survey respondents perceived climate change to be on a similar level of importance to them as the economy. Local education, community information and social and family ties were perceived as the best solutions to climate change issues, in addition to external financial and project-based assistance. Community members felt concerned about climate change and understood the potential issues associated with it, but not everyone perceived personal threats from it. Those who perceived a higher threat took more actions on climate change than those who did not feel as threatened, although feeling threatened was not a prerequisite for taking action.

Media

Media officers in Samoa perceived that they should take a leading role in raising awareness of the issues relating to climate change, but they also perceived climate change to be uninteresting to the public compared with other topics.

The media felt that the public is aware of climate change but needs to be informed about it in a way that sparks personal interest. The media workers felt that they knew how to identify climate change stories that do not resonate with the public, but they need more information and training to know what does work (i.e. climate change story-telling techniques that bring about behaviour change). They suggested that the best way to communicate information about climate change would be through local, personal stories, rather than stories containing technical acronyms that were about meeting agendas and outcomes. Personalized and localized climate change stories were seen for increasing public interest in the issue of climate change. The media officers also felt that making stories fun would engage people more. The media officers felt that television and radio are the best ways of communicating on the issue of climate change as these methods have extensive reach, covering a large percentage of the public.

Fiji

Teachers

Teachers in Fiji said that they found it difficult to teach about climate change because their students did not believe they were experiencing climate change and had no direct examples and applications of what they were learning about. Teachers perceived that students therefore lacked interest in climate change issues. Teachers felt that a lack of coverage of climate change in the curriculum was a barrier to teaching about the topic effectively. The teachers perceived, however, that if the topic of climate change was fully integrated into the curriculum, they would want to teach it because more resources would be allocated to assist them in teaching. For effective climate change education, teachers felt that although climate change should be integrated across the curriculum, it did not need to be covered in every subject. They felt that the topic should be included in specific classroom activities related to the subject being taught, but it should only be covered substantially in one subject. Teachers felt that climate change basics should be taught at the primary education level and be gradually scaled up, with more in-depth coverage in forms four and five. Teachers also felt that communities should receive climate change education in parallel with the education provided at schools so that knowledge gained at school is reinforced. They felt that community education on the impacts of climate change should be provided through such means as community-based workshops.

Communities

The location of the focus group was Navutulevu, which is on the southern coast of the island of Viti Levu. The community has set up a protected marine area. The community members perceived that they were vulnerable to climate impacts such as cyclones and believed that weather patterns were increasingly variable. In response to such issues, they were undertaking various activities, such as planting mangroves on the shoreline to protect their land from storm surges. They perceived human activities and development as key drivers of climate change and climate-related problems, but also perceived these as potential solutions. For example, industry and technology were perceived to be both problems

and solutions. Some community members felt that they did not have enough knowledge to be able to use technology effectively, however. Education was perceived as a key solution. The community felt that if people were better educated about climate change, they would have greater awareness of the issues and could contribute to solutions. Community members' concerns about climate change led them to take action on climate change, with men taking slightly more action than women. The reason for this could not be inferred from the data. The strongest correlation was that men who felt threatened by climate change also thought they could take action to deal with it. This may indicate that people who are most concerned also have the most hope that they can find solutions.

Media

The media perceived the information about climate change that they received to be too technical. They also noted that it was rarely transmitted in the iTaukei (Fijian) language, resulting in a lack of understanding of the issue at the community level. The media officers felt that for media content on climate change to have more impact, agencies wishing to share information about climate change should not exclude any potential channels of communication, but should include all: radio, TV, print and online media. They also felt that NGOs and other agencies should work across all media outlets to improve shared public messages on climate change and ensure consistent information is provided to the public. More frequent interaction and networking were seen as solutions for this.

Local stories create more traction because communities relate better to these types of stories.

Media officers in Fiji felt that local stories, for example, connecting global processes to local impacts, created more traction, because communities related better to these types of stories. To be able to tell such stories the media wanted more opportunities to visit communities and see local climate change impacts.

Better public education was identified in Samoa and Fiji as a key solution for improving the way climate change is communicated. The respondent felt that it was important to increase awareness at the grassroots level and to include the topic of climate change in the school curriculum.

Vanuatu

Teachers

Teachers in Vanuatu perceived the lack of coverage of climate change in the curriculum as a key barrier to teaching about climate change. Teachers noted that this lack of coverage meant that they did not have opportunities to teach about the topic of climate change and they felt that they were also under-resourced for teaching about the issue. The teachers also felt that resources needed to be better coordinated. Teachers hoped that this issue would be resolved in the near future with the inclusion of climate change education in the curriculum. Teachers also noted they wanted more training on the topic of climate change so that they would better understand the basics. They were also interested in learning more about incorporating traditional knowledge into climate change education and understanding the physical issues related to climate change.

Teachers in Vanuatu felt that the topic of climate change should be taught across many subjects, not in just one subject, and that climate change education should start from the junior level. They also felt that

it was important for teachers to share best practices on climate change education in order to generate new ideas and methods for sparking student interest in the topic of climate change.

Teachers who responded to the mobile phone survey were evenly split in terms of their perception of whether teaching about climate change is a priority. Half of the respondents said that they only prioritized teaching climate change "a little" and half said they prioritized it "somewhat" or "a lot". However, most teachers felt they can and must do something about it.

Communities

The focus group was held on the island of Pele where the community is involved in marine conservation.

The community members identified protection of natural resources as a key issue, especially with regard to garden crops and marine resources. Conservation was perceived as an important solution to climate change, particularly in terms of protecting food security and livelihoods. These perceptions are likely due to the fact that most of the community's resources come from the sea and the community has a history of working with NGOs and donor agencies on marine protection.

The community noted that traditional knowledge was an important element of their livelihoods, and that it should remain an important tool for responding to key challenges, including to climate change. However, they also noted that such knowledge was being impacted by climate change. It was also stated by the community that external agencies did not effectively incorporate traditional knowledge into climate change training.

Photo 6: Community members from Pele take part in the focus group in Vanuatu

Community members responding to the mobile phone survey felt concerned about climate change, but were split in their perception of whether climate change was the most important issue to them. Many felt that the economy and education were more important issues. The majority of community members responding to the mobile phone survey reported feeling threatened by climate change and most people reported taking action to deal with it.

Media

While the media in Vanuatu felt they should take a leading role in raising awareness about climate change, many did not feel they were effective in communicating about climate change. The media felt that climate change was a new issue to communicate to the public and that they needed more training to be able to report on climate change.

The respondents of the focus group felt there was a need to have more easily digestible information on the science of climate change and the impacts in Vanuatu, and more information on solutions. They felt that improving the dissemination of information, from ministries and agencies, for example, and involving media in climate change activities, would also help the media report more effectively on climate change.

Responses to the mobile phone survey indicated that the media felt that the information being provided on climate change was too technical and should be more accessible. Thus, although they felt climate change is an important issue, they felt that the information they received on climate change was too scientific and inaccessible. About half of the respondents felt they understood climate change "somewhat", while the remainder was split between a feeling of understanding the subject "very well" and "very little."

A summary of the findings can be found in Table 4.

Table 4: Summary of key findings of the surveys of the three groups (teachers, communities, media) and the three countries (Samoa, Fiji, Vanuatu)

		Samoa	Fiji	Vanuatu
TEACHERS	TRAINING	Teachers identified climate change as an important issue. They felt constrained by a **lack of training** on the issue and insufficient resources to make it easy to communicate in a local context. Teachers identified teacher **training as a high priority,** demonstrating that their capacity needs to be built before they can teach about climate change effectively.	Not mentioned.	**Teachers wanted more training on climate change** so that they would understand the basics. They were also interested in knowing more about combining traditional knowledge with climate change science to improve climate change education.
	CURRICULUM	Many teachers in the focus group perceived that no particular subject covers climate change adequately, and were **unsure about the inclusion of climate change in the curriculum.** They felt climate change should be coordinated across the curriculum.	Teachers viewed **the existing curriculum (which does not fully include the topic of climate change) as a barrier to teaching about climate change effectively**. Teachers said that if climate change were fully included in the curriculum, they would want to teach it and more resources would be allocated to assist them in teaching about climate change.	**The absence of the topic of climate change in the curriculum was seen as a key barrier** to teaching about the topic. First, because teachers do not have the opportunity to teach about the topic. Second, because of the lack of resources. Teachers were aware, however, that the curriculum is currently being updated to include climate change education.
	TEACHING	Emphasis should be placed on engaging **students early on and integrating climate change fully into a few key subjects, with just key teaching points in others.** Junior level (year 5-11) education on climate change was felt to be as important as senior level (year 12-18). It was agreed that **teaching the children from a young age would allow steady and consistent development of the basics of climate change** so that once they reach the senior level the subject is familiar.	Teachers felt that climate change does not need to be covered fully in every subject. Rather, it should be **substantially covered in only one subject, but included in specific classroom activities related to the subjects being taught.** The key for teachers to be able to teach about climate change was to be able to see how the topic relates to their own discipline. Teachers felt that climate change basics should be taught at **primary education level and be scaled up,** going into more in depth topics especially in form four and five (ages 15 and 16).	Teachers believed that **climate change should be taught across many subjects, not just in one subject, and** that climate change education should start from **the junior level.** They also saw opportunities for teachers to share best practices on climate change education as important for generating ideas and methods to engage students in climate change education.
	RESOURCES	Teachers agreed that the best teaching materials would be **toolkits** with information about climate change provided in simple language; **documentaries** on the impacts; and materials that engage students in **practical projects or experiments.**	Teachers suggested that children should be encouraged to learn about climate change through games and the use of technology.	Resources that teachers felt would be helpful included **textbooks, DVDs** and any **multimedia** about the physical science and problems of climate change.
	COMMUNITY EDUCATION	Localization of climate change issues through field trips and **broader community education on climate change were perceived as solutions** to help improve the effectiveness of teaching about climate change issues. Teachers perceived climate change as challenging to teach in Samoa because **neither children nor their parents consider it a serious issue.** Consequently, it is difficult to engage students in the topic.	**Communities should be targeted in parallel with students so that knowledge about climate change is reinforced.** Community education on the impacts of climate change should take place through such means as workshops. Students do not take climate change seriously because **many families and communities do not believe climate change is occurring.** As a result, there is a lack of student interest in learning about it.	Not mentioned.

Table 4: Summary of key findings of the surveys of the three groups (teachers, communities, media) and the three countries (Samoa, Fiji, Vanuatu)

		Samoa	Fiji	Vanuatu
COMMUNITIES	WEATHER/ LIVELIHOODS	Community members perceived the biggest local climate change issue to be **extreme meteorological events and ongoing changes in weather,** such as increasing heat.	Community members felt vulnerable to climate impacts such as cyclones and believe that **weather patterns are increasingly changing** but the community is trying to find solutions for climate-related coastal problems by taking action such as **planting mangroves** to protect from storm surges.	**Protection of resources** was a key issue for community members especially with respect to garden crops and marine resources. **Conservation** was perceived as a key solution particularly in protecting food security and livelihoods.
	SOCIO-CULTURAL/ TECHNOLOGY	Not mentioned.	Community members saw **human activities and development** as key drivers of climate change and climate-related problems, but also as potential solutions. Some community members felt they do not have enough knowledge to be able to use technology effectively.	**Traditional knowledge is an important adaptive tool for climate change.** Community members felt external agencies do not effectively incorporate traditional knowledge into climate change training.
	EDUCATION	**Local education, community information and social/family ties were seen as the best solutions** to climate change issues in addition to external financial and project-based assistance.	**Education is perceived as a key solution;** if people are better educated about climate change they will have better awareness about the issues, and can contribute to the solution. **A connection between learning in school and community-based understanding** was viewed as important.	**Education and community cooperation were highlighted as important solutions.** It was felt that the community should be encouraged by village leaders to seek more information and training on climate change, and children should be educated about climate change.
	THREAT AND ACTION	Community members felt concerned about climate change and understand the potential issues associated with it, but not everyone perceived personal threat from it. **Those who perceived a higher threat tended to take more action on climate change than those who did not feel as threatened.** Feeling threatened was not a prerequisite for taking action, however.	Community members' concerns about climate change led them to take action, with men taking slightly more action than women. **The strongest correlation was that men who feel threatened by climate change also thought they could do something about it.**	The majority of community members responding to the mobile phone survey **reported feeling threatened by climate change and most people reported taking action to deal with it.**

Table 4: Summary of key findings of the surveys of the three groups (teachers, communities, media) and the three countries (Samoa, Fiji, Vanuatu)

		Samoa	Fiji	Vanuatu
MEDIA	ROLE OF MEDIA	The media perceived that they should t**ake a leading role in raising public awareness of climate change**, but they also **perceived the topic of climate change to be relatively uninteresting to the public**.	The media felt that they have a **responsibility to educate and inform the public** and that it is their role to be the communication channel.	The media felt that they should **take a leading role in raising awareness** about climate change but **many did not feel that the media are effective in communicating about climate change.**
	INFORMATION SHARING	The media felt that the public know what climate change is, but that they need to be reminded about in a way that sparks personal interest, for example, through **effective communication of local stories rather than stories about meeting agendas and outcomes using technical language and acronyms.**	If media are to have a greater impact on climate change communications, the agencies should not exclude any potential channels of communication. **NGOs and other agencies should work across all media outlets to better share public messages on climate change.** The media perceived climate change information as being **too technical and often not in the iTaukei language**, resulting in a lack of understanding at the community level.	Improving dissemination of information, for example, from ministries and agencies, and i**nvolving media in climate change mitigation activities, would help the media to report more effectively on climate change.** Responses to the mobile survey indicate that the media feel that the information being provided on **climate change is too technical and needs to be more accessible.**
	LOCALIZATION/ AUDIENCE	Media officers said that it is very important to **personalize and localize** climate change stories so that audiences become interested in the topic. They also felt that **making stories fun** would engage people more.	Local stories in local languages get the best traction with the public. In order to be able to tell these stories the **media wanted more opportunities to visit communities to see local climate change impacts.** **Traditional knowledge has a role to play in communicating about climate change** but should be contextualised to make it relevant to what communities at risk are experiencing.	The media felt that the best stories on climate change include **local issues, with a local focus and personal stories.**
	EDUCATION/ TRAINING	The media believe that they know what climate change stories do not work, but **they need to know what will work** (i.e. the **best climate change storytelling technique that will bring about behaviour change**). The media wanted to learn more about **how to communicate about climate change** in compelling ways and more about climate change and its effects, so they could better inform the public.	**Improved public education was identified as a key solution** for improving the way climate change is communicated. For example, increasing awareness at the grassroots level to engage communities and including climate change in the school curriculum.	**Media officers felt they need more training to report on climate change issues** as many believe that climate change is a new issue. The media reported wanting to understand more of the **science behind climate change** but also more about climate change **impacts and solutions.**

Comparison of results and conclusions

A. Teachers

A1. Comparison of focus group results

Key concerns

Lack of training on climate change was a key issue raised in the focus group discussions in all of the three countries, but was of particular concern for teachers in Samoa and Vanuatu. In Samoa, 65 percent of teachers in the focus group felt that capacity building for teachers, in the form of training and workshops, would be the best solution for improving teaching about climate change. They also felt that the training should be in both Samoan and English, locally contextualized and involve outdoor experiments and fieldtrips. Similarly, in Vanuatu a lack of training and knowledge was identified by 55 percent of teachers as the biggest issue in teaching about climate change, and almost half (46 percent) of teachers identified training and knowledge as a key solution for improving teaching about climate change.

Lack of training of teachers on the topic of climate change was a key issue raised by focus groups, particularly in Samoa and Vanuatu.

Teachers in Vanuatu said they had undergone general teacher training at a point in time when climate change was not seen as a key issue or priority and, as a result, have only received information on climate change in a "piecemeal fashion", so they need comprehensive training on climate change issues. In Fiji, several teachers said they had not been given clear instructions and approaches in how to teach climate change and in which subjects. When asked to identify the biggest problem in teaching about climate change, however, teachers in Fiji did not raise lack of training as a key issue.

The results reflect a generally-held concern that teacher training on the topic of climate change is in its infancy.[12] Furthermore, the results reflect the view of teacher educators that training on this topic should include practical experiences for teachers, including engagement with climate change experts.[13]

Teachers clearly shared the perception that climate change was not yet effectively integrated in the existing curriculum. A coordinated approach is needed.

In all three countries, teachers agreed that climate change was not yet effectively integrated in the existing curriculum. In all countries, the curriculum was perceived as lacking the incentive mechanisms and structures to teaching climate change effectively. In Fiji and Vanuatu this was seen to be due to the fact that the curriculum had not been updated recently. Teachers also felt that climate change information was piecemeal and not integrated effectively within subjects across the curriculum.

The holistic and multidisciplinary nature of climate change education is seen an ongoing problem for teaching about it.[14] In Samoa, although climate change is mainly integrated into geography and science, a key problem raised was that students were not able to grasp the complex and often multidisciplinary

12 UNESCO. 2011. Climate change education is in its infancy. Website article. http://www.unesco.org/new/en/education/resources/online-materials/single-view/news/teacher_training_in_climate_change_education_is_in_its_infancy/#.UkpuPij4-24scholar.google.com

13 Åhlberg, M., Kaasinen, A., Kaivola, T. and Houtsonen, L. 2001. Collaborative knowledge building to promote in-service teacher training in environmental education. *Journal of Information Technology for Teacher Education*, Vol.10, pp. 227–240.

14 Stables, A. and Scott, W. 2002. The quest for holism in education for sustainable development. *Environmental Education Research*, Vol. 8, pp. 53–60.

nature of the subject matter because information was not delivered in a coordinated way. Similarly, in Fiji teachers felt that the current curriculum only covered climate change through fragmented and abstract scientific examples, such as teaching about the greenhouse effect, rather than adopting an overarching and holistic approach to teaching about the problem as a whole.

Overall, for all three countries, 40 percent of teachers identified the absence of climate change in the curriculum as the greatest problem in teaching climate change. The teachers in all three countries expressed a need for a coordinated approach to addressing climate change in the curriculum, as is being undertaken through various interventions such the *"Learning about Climate Change the Pacific Way: A guide for Pacific teachers"* toolkit prepared by SPC and GIZ, and the Environment Resource Education Guide.

While teachers in the three countries did not agree on how climate change should be integrated into education, they were unanimous that climate change education should start early on (in Samoa and Fiji, from primary level, in Vanuatu from junior-secondary level).

Teachers in Vanuatu identified traditional knowledge as playing an important role in climate change education, particularly in combination with climate science to support adaptation. Teachers in Vanuatu noted that while there is no traditional knowledge in the curriculum at present, there will be in the new curriculum that is currently being developed.

Teachers in Vanuatu identified traditional knowledge as playing an important role in climate change education.

Teachers in Samoa and Vanuatu saw the limited availability of relevant teaching resources as a key issue. In Samoa, 77 percent of teachers identified lack of resources as the biggest problem for teaching about climate change, while in Vanuatu, 41 percent of teachers did so. Discussions on this issue among teachers in Samoa highlighted that although teaching materials and textbooks on climate change were available, many teachers felt these materials lacked relevance to the local context. Some teachers expressed that textbooks were not helpful because the language was too complex and technical, and the teachers were therefore unsure whether they were interpreting and teaching the content accurately. Teachers agreed that the best teaching materials would be toolkits with climate change information presented in simple language, along with documentaries on impacts, and materials that engage students in practical projects or experiments.

Toolkits with climate change information explained in simple language, documentaries on impacts, and materials that engage students in practical projects or experiments would be the most useful teaching materials for teachers.

Teachers also pointed out that while resources exist, they were in many different places and formats. The teachers felt that these resources should be integrated to make them more accessible and useful. Teachers identified the "Learning about climate change the Pacific way: A guide for Pacific teachers" as one useful resource, but said that so far not all schools had access to it. They noted that this toolkit is specifically targeted at learning "the Pacific way", which they said is important for the relevance of activities and ideas. When asked what other types of resources would be helpful, teachers said that textbooks and DVDs would be useful, as well as any multimedia resources about the physical science and problems relating to climate change. A regional Pacific focus was preferred over an international one for all types of teaching-learning materials.

Existing resources are in many different places and formats, and should be integrated to make them more accessible and useful.

Teachers also noted that materials needed to be tangible – not online – because most teachers could not access the internet easily or inexpensively. While this is changing with the improvement of information and communication technology in the Pacific Islands,[15] it is currently an important issue.

In Fiji, teachers mentioned the lack of resources, but it was not considered a major issue (as in Samoa or Vanuatu). Teachers in Fiji suggested that more resources, for example books, should be made available for both urban and rural teachers. One teacher noted that rural school teachers were most affected by the lack of teaching and learning resources about climate change issues, indicating a possible rural-urban divide in terms of access to resources. This is an important issue considering the potentially high rural impacts of climate change and the need for good knowledge on the topic at the rural level so as to ensure responses are localized and effective.

Teachers perceived that family and community education can help increase the effectiveness of climate change education, and reinforce at home what is learned in the classroom.

Solutions

Broader family and community education on climate change was perceived as a solution by both Samoan and Fijian teachers to help increase the effectiveness of the climate change education provided to children at school, and to reinforce at home what is learned in the classroom. Community-based workshops could enable the information about climate change to be learned in an applied and experiential way, thus sparking the interest of the participants and enabling them to apply what they learn.

A2. Comparison of mobile phone survey results

In Fiji, there was a low number of responses by teachers to the mobile phone survey, so the data for Fiji was not included in the report. The results discussed below are therefore for teachers in Samoa and Vanuatu only.

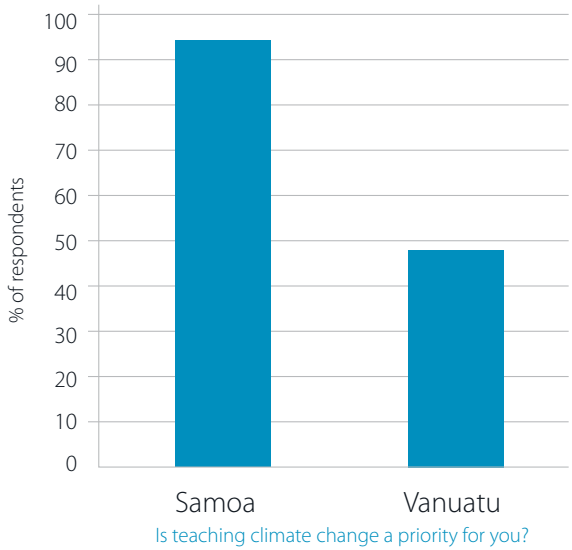


Figure1: The percentage of teachers in Samoa and Vanuatu responding "yes "or "yes somewhat" to the question "Is teaching about climate change a priority for you?"

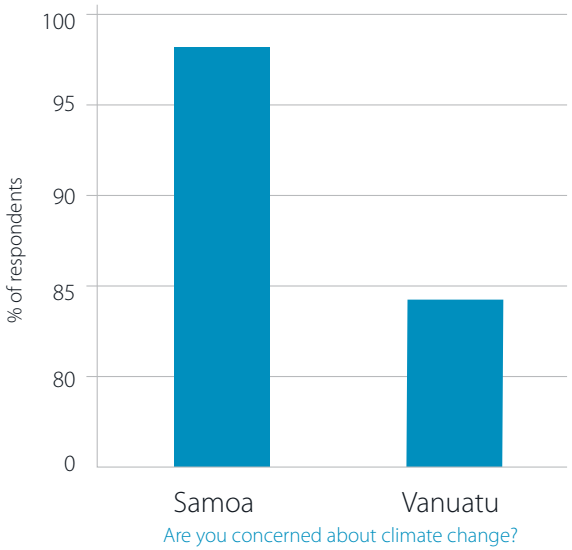


Figure 2: Percentage of teachers in Samoa and Vanuatu who answered 'yes' or 'yes somewhat' to the question are you concerned about climate change.

15 Bumpus, A.G. op. cit.

The priority attached to teaching about climate change was significantly different in the two countries.[16] In Samoa, 94 percent responded "yes, a lot" or "yes, somewhat" when asked whether teaching about climate change was a priority to them. In contrast, only 48 percent of teachers in Vanuatu responded in this way (see Figure 1). The teachers in the two countries had similar responses in terms of their perceptions of their personal level of understanding of climate change, however. In response to the question "Do you feel you understand climate change?" 85 percent of teachers in both countries reported "yes, somewhat" or "yes, a lot".

In Samoa, 98 percent of teachers reported being concerned about climate change, while in Vanuatu 84 percent felt this way (see Figure). The higher level of concern in Samoa correlates with the higher likelihood of action in Samoa, indicated by teachers' responses to the question regarding how they deal with climate change.

Aiming to understand perceptions of resilience and the ability to act, teachers were asked: "Do you think we can do anything to deal with climate change?" While most teachers responded that something could be done, a small proportion in countries, 8 percent and 7 percent of teachers in Vanuatu and Samoa, respectively, responded "we cannot change".

When asked which subject climate change should be included in, teachers in Vanuatu were fairly evenly split in terms of their views. Around one third (32 percent) felt that it should be taught in the sciences, 28 percent felt it should be taught in geography and 28 percent felt it should be integrated across all subjects. In Samoa, 41 percent of teachers felt it should be integrated in all subjects, 33 percent felt it should be part of geography, and only 17 percent believed it should be taught in sciences.

A3. Conclusions from the teachers' responses

The responses of the teachers in the three countries targeted under the SPARCK project indicate that there is a need for basic climate change training that is locally-adapted to ensure relevance and applicability. This view reflects the arguments of educators who see that science education must accommodate local contexts[17] and reflects a broader observation in the literature that teacher training, even in developed countries, is often not adequately tailored towards sustainable development.[18]

Many teachers also observed that for cross-cutting issues like climate change, curriculum coordination is important. Some teachers felt that certain subjects (e.g. geography) should lead the way with the concepts and basics of climate change and other subjects can then have specific teaching points on climate change where relevant. It was agreed that children should be exposed to this information at early grades of school.

For the most part, teachers consider teaching about climate change a priority and this is reflected in their level of concern about climate change. Given that only a small percentage of teachers felt that action could not be taken on climate change ("we cannot change"), there is a clear opportunity to empower teachers, who have a critical role in building knowledge and bringing about subsequent behaviour change, to become advocates for climate change education.

16 NB – It should be noted that teachers were only able to select one option so while they may have wanted to choose more than one option, the question required that a single response be selected. This should be kept in mind when interpreting the results.

17 Barab, S.A. and Luehmann, A.L. 2003. Building sustainable science curriculum: Acknowledging and accommodating local adaptation. Science Education , Vol. 87, pp. 454–467.

18 Summers, M., Childs, A. and Corney, G., 2005. Education for sustainable development in initial teacher training: issues for interdisciplinary collaboration. Environmental Education Research, Vol. 11, pp. 623–647.

To improve climate change education, teachers need relevant resources and these resources need to be easily accessible in both rural and urban areas. Resources should be tangible and should complement the curriculum.

B. Communities

B1. Comparison of focus group results

Key concerns

The surveyed communities were all concerned about ongoing changes in the weather over the years. Given the predicted impacts of climate change in terms of increasing temperatures and more extreme weather days (both heat and high rainfall), it is possible that these communities may already be experiencing unusual weather variability.

The surveyed communities in Fiji and Vanuatu seemed aware of the importance of conservation of their natural environment and were very concerned about protecting the natural resources that were essential to their livelihoods. This is likely to be related to the fact that both communities were located close to marine protected areas and these communities had received considerable external intervention and capacity building in the past. Thus, the community perceptions of climate change were influenced by what kind of conservation status their area had (e.g. Marine Protected Area).

Action

In Fiji, the Navutulevu community said they were starting to plant trees (mangroves) to protect against storm surges and also, although not climate change related, to protect against tsunamis. They noted that mangroves were important and more protective than sea walls because the trees helped maintain the beach. In Vanuatu, the community of Pele said that they were seeking external assistance to build a sea wall. It was suggested by some community members that a sea wall would not be the best thing for protection against sea level rise and storm surges. Some people felt that the community should plant more trees and mangroves instead. This indicated that so-called "soft adaptive responses" – planting mangroves instead of building concrete sea walls – were being actively explored in these areas.

Traditional knowledge

While traditional knowledge was not raised by the communities in Samoa or Fiji, it was raised in the focus group discussion on Pele, in Vanuatu as a key solution in coping with climate change. The community also highlighted the importance of traditional knowledge for improving education on climate change. Some community members expressed the need to combine traditional knowledge with science in climate change education. Traditional knowledge has been highlighted in other contexts for Vanuatu,[19] indicating possibly that traditional knowledge has more importance in Vanuatu than it does in the other two countries, or it may indicate that previous interventions with regard to climate change education in Vanuatu have drawn attention to the value of traditional knowledge in coping with the impacts of climate change. Additional research is required to better understand the links between climate change, disaster risk reduction, traditional knowledge and the role of education in this area.

19 Walshe, R.A. and Nunn, P.D. 2012. Integration of indigenous knowledge and disaster risk reduction: A case study from Baie Martelli, Pentecost Island, Vanuatu. *International Journal of Disaster Risk* Science Vol. 3, pp. 185–194.

B2. Comparison of mobile phone survey results

Key Concerns

Extreme weather events and sea level rise were identified by the communities in all of the countries as the top issues associated with climate change. In Samoa and Fiji, extreme weather was considered more problematic than sea level rise, while in Vanuatu sea level rise was voted as the biggest problem, followed by extreme weather. Extreme weather was also raised as a key issue in all of the focus group discussions with communities, demonstrating that this is indeed a concern in all three countries. The small variation between the communities' concerns (extreme weather vs sea level rise) could reflect their varying levels of exposure to the impacts of climate change. It is important to keep this in mind when designing and planning adaptation strategies and actions in the three respective countries.

Knowledge about climate change

In all three countries, most community members felt that they understood climate change. In response to the question "Do you feel you understand climate change?" 90 percent of the participating community members in Vanuatu responded "yes, a lot" or "yes, somewhat". Lower percentages were recorded in Samoa (84 percent) and Fiji (81 percent).

As hypothesised at the beginning of the project, there were some inaccurate perceptions about the impacts of climate change. This varied depending on the country. While small percentages of respondents in Samoa identified tsunamis (9 percent) and earthquakes (16 percent) as climate change problems, and some respondents in Fiji did so too (1 percent and 3 percent, respectively), none of the respondents in Vanuatu selected tsunamis or earthquakes as climate change problem. This may perhaps reflect a higher level of awareness in Vanuatu of climate change causes and effects. These findings, combined with the finding that community members in Samoa and Fiji are less confident about their understanding of climate change indicate that there may be some knowledge gaps in Samoa and Fiji. Such gaps could be addressed by community education on climate change. The findings indicate that training sessions should emphasize the causes and impacts of climate change, particularly for the local context (where the training is taking place).

The results reflect earlier observations by Tiatia (2009) and Möhlendick (2010) who reported that levels of understanding of climate change may be low in Samoan communities. The results also show that there exist different levels of understanding of climate change in Samoa, Fiji and Vanuatu. Thus, it should not be assumed that understanding and knowledge related to climate change is the same throughout the Pacific.

B3. Conclusions from the community responses

The results of the focus groups and mobile phone survey indicated the importance of having sound knowledge on specific climate change issues to enable discussions of specific solutions. In Samoa it was seen that, with a limited timeframe, it was difficult to engage communities in discussions of solutions if they had not received previous training on climate change. These respondents found it difficult to articulate how they are being affected by climate change, and subsequently found it difficult to discuss their perceptions of the best solutions in terms of coping with specific climate change issues.

These findings support the findings of other research.[20] The findings of the focus groups and mobile phone survey also support conclusions in other studies that capacity-building and community-based education are important in raising awareness of possible climate change coping mechanisms, including "soft" adaptation approaches.[21]

This illustrates the interesting interaction between awareness-raising, education and capacity building and suggests that theoretical knowledge about the causes and effects of climate change is insufficient for the development of local coping mechanisms. People must also be informed of ways other people in similar situations are coping for them to be able to develop their own local methods for addressing the issues. Sharing of information on effective coping mechanisms would allow communities to learn from each other and would enable them to make any necessary behavioural changes faster than if they each have to develop original coping mechanisms.

Interesting dynamics were seen between the perception of threat and the perception of possibilities for action and action taken. Perceptions of threat varied significantly between the three countries. The communities in Samoa had the lowest perceptions of threat, with only about half of the respondents reporting that they felt threatened "a lot", and just under a quarter reporting that they felt they were not threatened at all by climate change. In Fiji, significantly more community respondents (77 percent) felt threatened or very threatened (answering "yes" or "yes, a lot"), and only 1 percent reported not being threatened at all. In Vanuatu a very high proportion (91 percent) felt threatened "a lot", and no community members reported not feeling threatened at all. These findings may again reflect the higher level of knowledge about climate change in Vanuatu. The findings also indicate that while community members may understand the issues relating to climate change, that doesn't mean they feel they are experiencing a personal threat from climate change (at the current time).

People may understand climate change, but not everyone believes they are experiencing personal threat from climate change.

The communities in the three countries also had differing perceptions of their ability to take action on climate change. Most community members in Fiji felt that they could take action (80 percent), while 73 percent of community members in Vanuatu and 64 percent of community members in Samoa felt this way. The findings seem to indicate that perceptions of threat are not linked to perceptions of capacity to take action. While only half of the Samoan respondents perceived a large threat from climate change, 64 percent of Samoan community members perceived that they could take action to manage the impacts of climate change. This contrasts strongly with Vanuatu, where almost everyone perceived a large threat from climate change, but only 73 percent perceived they could take action, not much more than the percentage seen in Samoa.

C. Media

C1. Comparison of results

Media officers did not respond in large number to the mobile phone survey, with only five responses in Fiji, 10 in Samoa and 12 in Vanuatu. Therefore, the information and conclusions presented here are drawn principally from the focus group discussions, with only supplementary evidence provided from the mobile phone surveys.

20 Barnett, J., 2001. Adapting to climate change in Pacific Island Countries: The problem of uncertainty. World Development 29, 977–993.

21 Gilman, E.L., Ellison, J., Duke, N.C. and Field, C. 2008. Threats to mangroves from climate change and adaptation options: a review. Aquatic Botany, Vol. 89, pp. 237–250.

Key concerns

The media participants in the focus group discussions in Samoa and Fiji had similar perspectives with regard to the key problems in communicating about climate change, with around half of the respondents in both countries identifying technical terms and the use of acronyms by climate change agencies as key problems (45 percent in Samoa and 50 percent in Fiji). Interestingly, Fewer than 10 percent of the media participants in the focus group in Vanuatu found the technical terms and acronyms to be problematic. The Vanuatu responses to the mobile survey question asking what their biggest problem is when reporting on climate change conflicted somewhat with the responses of the Vanuatu focus group, however, with 66 percent of media respondents to the mobile phone survey citing "climate change information is too scientific" as the main issue.

In all three countries the media said that they often found it difficult to turn press releases about climate change into compelling stories. It was stated that this was not only because press releases contained too many acronyms and used too much scientific terminology, but also because the information provided was not localized and did not include personal stories. This made it difficult to create relevance for the public. Media officers in the three countries felt that they needed more easily digestible information about the problems and solutions, and needed local, personal and interesting stories about the impacts and counter-measures.

Solutions

When asked what the best solution was in terms of improving communication about climate change, around half (55 percent) of the media officers in both Samoa and Fiji felt that public education on climate change would be the best solution. In Fiji, a large proportion (33 percent) of the media officers felt that building capacity in the media would be the best solution for communicating climate change. In Samoa media officers pointed out the need for more information and training to know what will work (i.e. the best climate change story telling technique).

In Vanuatu, around half (58 percent) of the media officers felt that media training would be the best solution. Media officers in Vanuatu felt that public education is necessary and they have an important leading role to play.

Around half of the media representatives in Samoa and Fiji felt that public education would be the best solution for improving about climate change. In Vanuatu, more than half of the media representatives felt that media training would be the best solution. In Samoa media officers need training in climate change story telling techniques

In Vanuatu, the media felt that better flow of information and more information coming from authorities such as GIZ and the Meteorological office would assist in improving the way climate change is communicated. Similarly, in Fiji the respondents felt that the flow of information between NGOs/agencies and the media needs improvement and that there should be agreement and shared information on climate change issues.

Better flow of information would assist in improving the way climate change is communicated.

C2. Conclusions from the media responses

The findings show that the media officers' understanding of climate change affects how well they can communicate about it and training of media officers on the topic would be welcomed by many. Such capacity building would lead to greater awareness of climate change and better understanding of the pressing

risks climate change poses. While the lack of understanding has an important effect on the level and quality of reporting about climate change in the three countries, there are other factors that have an impact, however. These include the type of language used (i.e. acronyms are still the norm in Pacific climate change work) and the level of public knowledge of, and interest in, climate change (low public interest in the topic makes it difficult to interest editors in publishing climate change stories).

The findings also indicate that for media coverage of climate change to have greater impact, climate change agencies communicating on these issues should not exclude any potential channels of communication.

It is clear that there is a tension between communicating about climate change effectively while also making climate change stories engaging and accessible to the public.[22] While some media officers may want to learn how to make stories more "fun", it is important not to diminish the seriousness of the issue of climate change as this may have negative effects on risk perceptions.

Phase II Activities and Outcomes

Description

Phase II of the SPARCK project consisted of a capacity-building activity for high school teachers. It was held in Samoa, over two days, on 3 and 4 September 2013. Day 1 consisted of climate change science training (What to teach) and the development of teaching methods and activities (How to teach). Day 2 involved a visit by teachers to a coastal community for observation and discussion of real-life climate change issues and solutions.

Key objective

To provide high school teachers in Samoa with better understanding and knowledge of the basic science of climate change, to offer practical ideas and resources that they could use to incorporate climate change education into classroom lessons, and to assist teachers to learn more about climate change issues at the community level.

Intended outcomes

- Key findings and conclusions from Phase I are put into practice.
- Teachers gain new knowledge about the science of climate change and learn of existing resources and toolkits that are available.
- "Classroom to community" interactions allow teachers to see community climate change issues first-hand, and gain awareness on how to incorporate these issues in their teaching.

22 Anderson, A. 2009. Media, politics and climate change: towards a new research agenda. *Sociology Compass* Vol. 3, pp. 166–182; Ladle, R., Jepson, P. and Whittaker, R.J. 2005. Scientists and the media: the struggle for legitimacy in climate change and conservation science. *Interdisciplinary Science Reviews* Vol. 30, pp. 231–240; Nordhaus, T.and Shellenberger, M. 2009. Apocalypse fatigue: Losing the public on climate change. *Yale Environment* 360, Vol.16.

Building on existing knowledge

The SPARCK capacity-building activity focused on providing training on the basic science of climate change, and utilized existing knowledge and resources to equip teachers with ideas and tools on how to improve teaching about climate change.[23] The training was also based on the Pillars of Education for Sustainable Development advocated by the UNESCO.[24] This training addressed some of the short-term challenges identified in Phase I of the SPARCK project.

Overview of the activity

Day 1 of the capacity-building activity had two parts: Part 1 (What to teach), which covered the basic science of climate change, and Part 2 (How to teach), which covered teaching-learning methods. Day 2 of the capacity-building activity (Part 3 of the activity) involved an interactive meeting between the high school teachers and community members, enabling them to share information and ideas about climate change education. Details of the capacity-building training schedule can be found in Appendix 7.

Part 1: What to teach

Introduction

This section provides an overview of the expert presentations given in Part 1 of Day 1 of the capacity building activity. The presentations explain the current level of integration of climate change into the curriculum in Samoa; the impacts of climate change on Samoa; the different aspects of risk and resilience; and the role of mangroves in adaptation.[25]

Presentation 1: Climate change in the Samoan curriculum

Leauga Tamasoalii Saivaise (Ministry of Education, Sports and Culture) presented the current status of climate change in terms of its inclusion in the Samoan education curriculum. He highlighted the importance of climate change learning, the different projects that the MESC is involved in (including SPARCK) and noted the importance of upcoming toolkits, such as the one developed by SPC and GIZ.

Presentation 2: Climate science impacts for Samoa

Dr Adam Bumpus (Co-founder of Apidae and Assistant Professor in Environment, Innovation and Development at the University of Melbourne) presented the latest information about the impacts of climate change on Samoa. He drew on data compiled by the Pacific-Australia Climate Change Science and Adaptation Planning (PACCSAP) programme.[26]

23 One key document utilized was "Learning about Climate Change the Pacific Way – A Guide for Pacific Teachers" (SPC and GIZ, 2013).

24 UNESCO. Education for Sustainable Development. http://portal.unesco.org/geography/en/ev.php-URL_ID=14132&URL_DO=DO_TOPIC&URL_SECTION=201.html

25 The PowerPoint presentations given can be found in the SPARCK Teacher Training Toolkit. YouTube videos of the presentations can be seen at: http://www.youtube.com/user/apidaeDI.

26 Pacific Climate Change Science Programme. Country Brochures. http://www.pacificclimatechangescience.org/publications/country-brochures/

Presentation 3: Impacts, risk, resilience and traditional knowledge

Dr Denis Chang Seng (Programme Specialist for Natural Science, UNESCO Apia Office for the Pacific States) gave a detailed presentation on climate change impacts, risk, resilience and the importance of factoring-in traditional knowledge in adaptation and resilience building.

Linking to the science knowledge on impacts mentioned in Presentation 2, he highlighted the need to understand the different aspects of risk. This includes understanding the physical exposure, susceptibility and vulnerability aspects of risk and how these link to climate change adaptation. Providing examples from Samoa and the Pacific, he also introduced and highlighted the importance of traditional knowledge, including traditional knowledge calendars that can be used in combination with climate change science to improve communities' responses to climate change and disaster risks.

Presentation 4: Mangroves and adaptation

Carlo Iacovino (Climate Change Communications Officer, SPREP) explained the importance of mangroves as an adaptive response to climate impacts in Samoa. Highlighting some of the capacity-building work that SPREP has been undertaking in the Pacific, he noted the multiple benefits that come from "soft" adaptation actions such as planting mangroves for coastal protection in comparison to "hard" adaptation actions such as building seawalls. He noted that these soft approaches can be used in combination with other conservation activities to help to preserve fresh water supplies and prevent soil erosion.

Part 2: How to teach

Introduction

This section describes the activities implemented in Part 2 of Day 1 of the capacity building training for high school teachers held in Apia on 3 September 2013. The activities described here can be used to teach about climate change in the classroom and in community-education sessions.[27]

Presentation 5: Teacher resources for climate change education

Dr Bumpus described various resources that have been developed so far for climate change education. In addition to resources specifically developed for educators in the Pacific region, he introduced a variety of online resources for teachers. He emphasized the need to make such resources readily available in the classroom, noting the lack of internet access Pacific Island teachers currently have. He also noted, however, that teachers have increasing access to the internet, including through Samoan tele-centres in rural Samoa, so teachers may be able to benefit from online resources in the near future.[28]

27 Many of these activities were sourced from "Learning about Climate Change the Pacific Way – A Guide for Pacific Teachers" resource (SPC and GIZ, 2013).

28 For examples of tele-centres in Samoa, see: Ministry of Communications and Information Technology. Rural Connectivity Programme. www.mcit.gov.ws/ICT4DevelopmentProjects/RuralConnectivityProgram/tabid/48/Default.aspx

Activity 1: "Home and Expert"

Aim: To help teachers learn about several climate change teaching-learning activities.

What: This exercise enables teachers to learn about a variety of available activities for teaching-learning about climate change.[29] Teachers had the opportunity to try several activities from "Learning about Climate Change the Pacific Way – A Guide for Pacific Teachers" they might use in their teaching.

How: The teachers were divided into small groups of around five people per group. These groups were named A, B, C, D, etc. Then, within their groups, the teachers were asked to number themselves 1 to 5 (or however many group members there were).

Several activity stations had been set up around the room and each activity station featured a particular teaching-learning resource. The activity stations were numbered 1, 2, 3, etc. The facilitator explained that all the teachers who had been given the number 1 would go to Activity Station 1; all the 2's would go to Activity Station 2; etc. Each group spent 20 minutes at one Activity Station to examine the teaching-learning resource. The teachers then went back to their home groups (A, B, C, etc) and each teacher, now the "expert" on their activity, reported back to their home groups about the resource they had examined, giving a two-minute summary on their resource and suggestions on ways of using the resource. Finally, teachers were asked to discuss the resources, and summarize their discussions in three key points.

Photo 7: Teachers taking part in the "shrinking islands" activity

29 NB – this activity could also be used for students to learn about different climate change issues, for examples stations could have information on sea level rise, ocean acidification, food security etc. that they would report back to each other.

Photo 8: Teachers worked on the Y-chart exercise for understanding climate change experiences

The resources included activities from the "Learning about Climate Change the Pacific Way – A Guide for Pacific Teachers" (Shrinking Islands, Y-Charts, Consequence Wheel), and from the "Adventures of the Pacific Climate Crab"[30] handbook (El Niño/La Niña and the Weather and Climate Exercise). These are detailed in the UNESCO SPARCK Teacher Resource book.

Questions the participants were asked to think about during the exercise:

- How could you use this activity in your teaching?
- What did you learn from the resource or activity?
- What was useful, not so useful?
- As a student, what would it be like to experience the activity?
- How does the activity improve sharing of knowledge on climate change?
- In what ways could you change/modify the activity for your classroom?
- How could these activities be linked to working with students in a village or community?

Why: The benefit of this activity was that each teacher became an "expert" on one resource and also received information on all the other activities from the other teachers in their group. By actually "doing" the activity the teachers were more likely to remember it and think about how to apply it in their classrooms.

30 See: Pacific Climate Change Science Programme, Climate Crab Action Handbook. http://www.pacificclimatechangescience.org/animations/climatecrab/

Activity 2: How to plan a "Climate Action Day"

Aim: To encourage teachers to think about how climate change activities and information could be incorporated into various subjects to assist in broader learning on the issue.

What: A Climate Action Day is an educational and awareness-raising day for schools and classrooms focused on activities relating to climate change science and solutions. It is a way of creating awareness among students and educating them in diverse and experiential ways about the various dimensions of climate change. The teachers were encouraged to think of ways of holding a Climate Action Day at their schools and/or in their classrooms. Using ideas that arose from doing the Home and Expert activity, the teachers thought about how to incorporate a Climate Action Day featuring various subjects and topics.

How: Six stations, each representing a different way of organizing a Climate Action Day (i.e. sports, music/dance/theatre/art, science experiments, mathematics games, traditional knowledge/social studies, geography), were set up around the room.

Teachers were placed into groups and each group began at a different station. The groups rotated from station to station, adding their ideas (each team with a different coloured pen) to sheets of paper at each station. At their last station each group reported back to the rest of the participants what was written on the sheet of paper.

Questions teachers were asked to think about at each station:

- How could you incorporate this theme (e.g. sports) into a climate action day?
- What are some ideas for activities/games/competitions you could use that would teach about climate change?

Why: The benefit of this activity was that it provided a way of encouraging the participants to think about how to incorporate the topic of climate change into a broad range of subject areas. Students often perceive climate change as a dry and boring subject. By finding out how to make learning fun with games, competitions and activities, the teachers are now able to use unique ways to engage and educate their students about climate change.

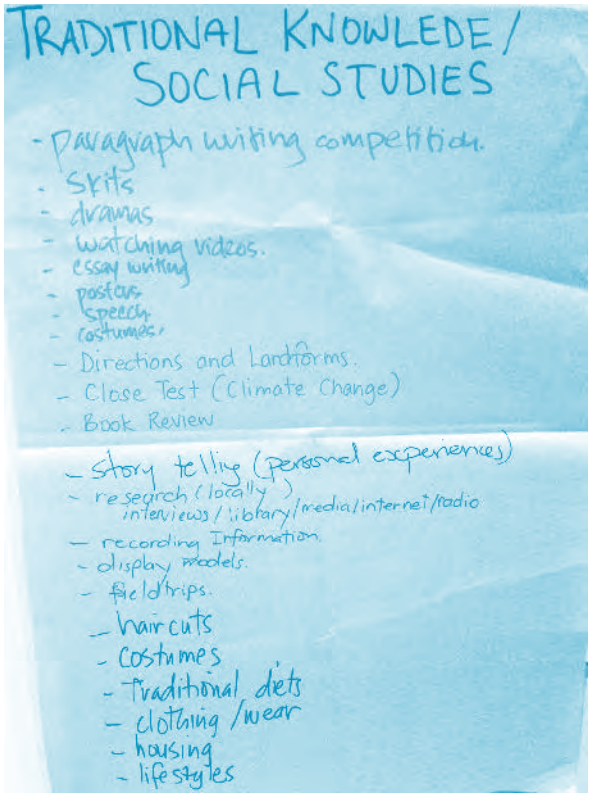


Photo 9: An example of a station for the climate action day planning. The teams moved from station to station. Each team had a different colour pen and added their ideas.

Part 3 Bringing community concerns into the classroom

Introduction

Day 2 of the capacity building activity took place in the community of Falease'ela on the southwest coast of the island of Upolu. The participating teachers (15) were taken on a bus from Apia to Falease'ela. Representatives from Apidae, MESC, the Global Climate Change Alliance and UNESCO were present and facilitated the interaction between the teachers and community members.

Day 2 aimed to help provide teachers with information about the local context of climate change issues, enabling them to link what they are teaching about (e.g. increasingly frequent storm surges as a result of climate change) to issues that the community are facing (e.g. influx of salt water on their crop land). The exercise provided a real world opportunity for learning about climate change issues. By connecting theory to reality, the teachers and the members of the community were able to work together to find effective ways to educate students on climate change (see Figure 3).

Figure3: Integrating classroom to community in education capacity building in climate change adaptation.

Activity 1: "Classroom to Community"

Aim: The aim was to help improve communication between teachers and community members to help link climate change education and community-based climate change action.

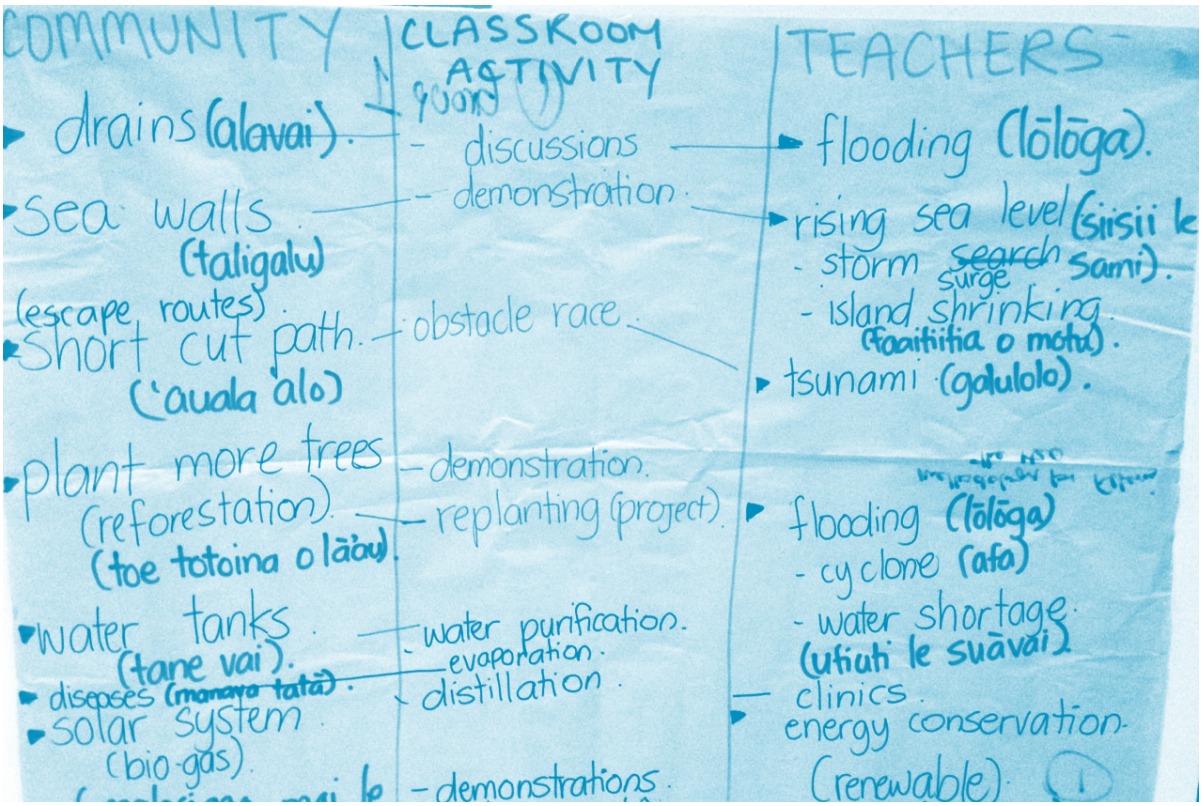
What: Working together in groups, teachers and community members identified and discussed some of the key climate change issues and challenges for the community, the related topics that teachers could teach about in the classroom and the teaching-learning activities they could use (see Photo 10).

How: Teachers and community members were divided into several groups (for example, three teachers and six community members per group). Working together, the teachers came up with three climate change topics they would like to teach about and activities that they would like to use, based on what they learned at the capacity-building training on Day 1. Meanwhile, the community members identified three related climate change issues in their community. Together, the teachers and community members worked to link up the teaching topics/activities with what is actually happening in the community (see Photo 11).

Each group then reported back to the other participants on what they had learned. Each group nominated one teacher and one community member to be spokespersons to explain the three teaching topics and corresponding climate change issues.

Photo 10: Teachers and community members discussing during the 'Classroom to Community' exercise.

Photo 11 (below): Examples of the connections that can be made by highlighting community concerns and solutions to climate change and connecting them with teaching priorities and ideas for classroom activities (in centre column).



Example

The community had issues with water management and therefore wanted to install water tanks. The teachers thought about the issues around water shortages that they could teach about in relation to climate change. Between these two ideas, an idea for a teaching-learning topic emerged around water purification. An activity was designed, using local materials, for students to undertake experiments on water purification and water management. Another idea for an activity was to create an obstacle course that might replicate damage done by flooding. This was seen as an interesting, fun and informative way to discuss climate change impacts and responses to those impacts.

Why: The benefit of this activity was that it allowed teachers to hear about community climate change issues first-hand. Additionally, it helped to identify practical ways of teaching about particular issues in the classroom, with input from community members. At the same time, communities learned how students are being taught about climate change issues in school and more about climate change itself.

Activity 2: Community Photo Tour

Aim: To facilitate a village tour by community members for teachers, during which the community members would explain the key climate change issues that affected them, so that the teachers could learn about these issues.

What: Community members led teachers on a village tour to explore various climate change issues (coastal erosion, forest damage from saltwater flooding, etc.). Photos were taken during the tour to illustrate key problems and solutions. The teachers reflected on how they could teach their students about the problems and solutions using the photos.

How: Community members and teachers were divided into groups of 6 to 8 people. Community members then led the teachers in their groups on a tour around the village, with community members and teachers each taking three photos of three climate change related problems or solutions they saw and would like to discuss (see Photo 12 and 14). For each photo taken, teachers explained how they could teach students based on the idea/concept in the photo.

After the tour, each group had five minutes to show their three pictures, and two spokespersons for the group (one teacher and one community member) explained why they took the photos, how the issue impacted the community and how teachers could incorporate this issue into teaching topics/activities etc. The participants then discussed the following questions.

Photo12: Community members led teachers on a community photo tour of key local climate change issues, such as coastal erosion and flooding that could be taught in the classroom

Photo 13: A photo taken to illustrate the need for effective water management to counteract climate change impacts

Example

A photo of water flow in the village illustrated the issues with flooding due to increased heavy rain days and the need for improved water management for future droughts (see Photo 14). Teachers could use this photo to talk with students about the changes that climate change will bring and the reasons improved water management is necessary.

Discussion questions:

- What have the teachers learned about climate change by being in the community?
- What do the community members think about what is taught on climate change?
- How can teachers and communities work together to educate students and parents?

Why: The benefit of this activity was that teachers got to see climate change problems, challenges and solutions from the perspective of the affected community. They could later reflect on how the issues/solutions in the photos could be turned into topics and teaching-learning activities for use in the classroom.

Feedback on the capacity-building activity

The feedback received from teachers for both capacity building days was overwhelmingly positive.

Day 1: Teachers

All of the teachers felt the training helped their understanding of climate change (68 percent strongly agreed, 32 percent agreed). They all also felt that this activity helped them to better understand how to teach the topic of climate change (60 percent strongly agreed, 40 percent agreed).

One teacher commented that "It was a very interesting training and very impressive activities were carried out really well. Hope to attend more training on climate change in the future". Another participant stated that: "The training was very important. It gave a lot of information to help us understand climate change. In this way, I can help the students and the community as well". Another teacher noted that

the format was different to the training they usually received and was particularly effective: "[We] need more training like this because it's very fun, useful and helpful for my teaching career".

Most of the teachers who participated in the training said that this workshop would change the way they taught climate change in the future (52 percent strongly agreed and 44 percent agreed).

Some teachers commented, however, that more time should have been dedicated to the workshops: "[It was] too tight a programme. It would have been better to end each of the sessions with questions".

Photo14: Explaining the reasons for choosing the photos to the rest of the group of teachers and community members.

In addition, some teachers felt that hard copies of the presentations should have been made available directly: "Just a suggestion to provide hand-outs showing the PowerPoint process".

To attend to this concern, the Apidae team and UNESCO put together a teacher toolkit so that teachers could access the resources that were used in the capacity-building activity. This resource includes links to online resources on a YouTube channel (http://www.youtube.com/user/apidaeDI).

Day 2: Teachers and the community

The visit to the community was seen as an important intervention and one that was new to the teachers: "It was a different experience to work with the community and it was fantastic". Others noted that it was "well done" and that they "need more workshops like this".

> ***"It was a great opportunity to share ideas with the community"***
>
> *Classroom to Community exercise Teacher participant*

Of the 15 teachers that participated, all believed (64 percent strongly agreed and 36 percent agreed) that it helped their understanding of climate change. More importantly, 79 percent strongly agreed that the training would help their understanding of how to teach climate change and that it was useful to spend time with the community. Almost three-quarters of the teachers (71 percent) strongly agreed that these activities would change the way they teach climate change in the future. This supports the finding, highlighted in Phase I, that experiential, local and practical approaches to teaching can improve teaching and learning about climate change.

The success of the capacity-building activity strongly suggests that similar training interventions would hold value for teachers.

Due to limited time, it was not possible to obtain feedback from the community members regarding how they felt about the workshop. Acquiring community feedback is an important next step for better understanding how such interactions could be improved in the future.

Photo 15: Group photo of participants on Day 2 of the SPARCK capacity-building activity.

Recommendations

Short-term

Provide training for teachers and communities

Teacher training on climate change should continue, focusing on the basic concepts as well as on how teachers can utilize teaching and learning resources in the classroom, especially as new resources and toolkits emerge.

Capacity building and training people in communities on climate change issues should be a priority so as to raise awareness of impacts and appropriate solutions.

The SPARCK results showed that understanding and knowledge related to climate change are not the same everywhere in the Pacific. Thus, interventions need to be adapted for specific audiences in the Pacific.

Improve communication and collaboration

Climate change agencies should use fewer technical terms and acronyms, and should make communications relevant at the local level.

Given that climate change is a complex and multidisciplinary issue, there is a diverse array of stakeholders involved in climate change education (e.g. teachers, development actors, scientists, academics, government officials, communities). It is necessary for these stakeholders to work more closely together

to increase public awareness and understanding of climate change so that communities can develop locally-appropriate means of addressing the impacts of climate change. As demonstrated in the SPARCK project, when stakeholders better understand each other's roles, needs and challenges in addressing climate change they can work together to improve climate change education. Collaboration and consultation are important steps in improving this understanding.

In particular, there is a need to improve interaction and relationships between the communications professionals of agencies working on climate change issues and media officers. One way of doing this is to improve the organizational arrangements for climate change information management and coordination. For example, to improve information flow between NGOs or agencies and the media, regular meetings or information sharing mechanisms (examples could include networking events or mail lists like Pacific Solutions Exchange). Networking events, communities of practice and group communications (e.g. on LinkedIn, Facebook) could also help connect agency communication staff and the media. Consistent exchange of information on climate change issues will increase media reporting on climate change. In addition, agencies and the media should use a variety of media channels for disseminating key messages. This will improve the way climate change information is relayed to the public.

Medium-to long-term

Conduct research on perceptions of risk and vulnerability

There is a need for more information, research and analysis of perceptions in the wider Pacific regarding climate change responses. In particular, further research is needed to better understand how people in each country perceive risk and vulnerability, and how this influences their willingness to act and perceptions of success.

Social and cultural aspects of information and communication technology for climate change initiatives should be better understood

The findings of the SPARCK project highlighted the need for continued efforts to consider community perceptions, cultures, norms and environmental conditions when designing tools, methods and policies for adaptation to climate change. Communities should be empowered to explore adaptation options through their own traditional methods and knowledge. This should consider, where appropriate, the use of mobile and web technologies (which are becoming increasingly accessible in the Pacific). These technologies offer an opportunity to engage citizens at different levels. As shown by SPARCK, however, this technology cannot be used in a vacuum; it must be supported by local champions, be engaging and compelling, and provide incentives (prizes or valuable information) to those offering information. Similarly, using mobile phones to source information from communities on the success of local adaptation projects can be an effective way of managing information. However, if the community does not "buy in" to using the particular form of technology for this reason (for example, if only some have access to the technology) it could, potentially, have harmful impacts on the community.

In the context of community-level adaptation, emerging technologies can be useful tools for managing the impacts of climate change. However, caution should be taken in how the technology is utilized. Engaging communities in using these technologies should occur on a case-by-case basis, align with community needs, and fit within the broader socio-cultural context.

Conduct more comprehensive capacity-building about climate change

To increase knowledge about climate change and resilience in communities, it is necessary to scale-up and replicate capacity-building activities such as those carried out in SPARCK. Implementing similar training activities in other countries in the Pacific would enable other teachers, communities and media officers to increase their understanding of climate change causes and effects and pass that knowledge on to others. Improving the understanding of the causes and effects tends to encourage the development of adaptive responses to climate change. This includes organising regional strategic meetings on capacity building and education about climate change.

The SPARCK project findings underscored the high importance of knowledge and awareness-raising on specific climate change issues in terms of enabling discussions on specific solutions. Specifically, it showed that there are important interconnections between public awareness and understanding of climate change, the ability of the media to both support, and be supported by, this understanding, and the importance of broad education both in schools and communities on climate change science and responses.

Given the amount of capacity building occurring in different sectors, it is highly recommended that a workshop be held for all stakeholders engaged in climate change capacity building relevant to the target sectors of the SPARCK project. This workshop could address new ways of planning for climate change capacity building, the short-, medium – and long-term strategies for building capacity in these three target sectors, and how these activities could be aligned to ensure maximum results.

Policies, research and capacity building in different countries need to factor in the potential variations in terms of a respective country's priority concern regarding climate change exposure and impacts; differentiated between extreme and creeping onset hazards associated with climate change.

Develop information-sharing mandates

Government and non-government actors need to develop effective organizational and institutional mandates to improve information-sharing about climate change. In particular, the media sector needs to prioritize information sharing climate change as part of their role in civil society and their responsibility to the public. This should gradually help replace the ad hoc approach currently being exercised in the media sector.

Make climate change teaching-learning resources accessible to all

There is a need to decentralize and synergize climate change resources in both urban and rural areas. Resources (e.g. brochures, posters, publications and toolkits) should be made more easily accessible and available (e.g. via the school library) to communities and teachers.

Final thoughts

The SPARCK project aimed to contribute to both analytical research and ideas on how key target populations interact, in addition to providing tangible tools to teachers and communities for facilitating improved climate change education. It is hoped that the recommendations provided here will be followed and will be a lasting outcome from this work.

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APPENDICES

Appendix 1: Example of a focus group running sheet

Focus Group –Teachers –Vanuatu

19 May 2013, Vanuatu Institute of Teacher Education

Topic	Who	Description	Time
Introductions	Adam/Joelle	**Welcome and explanation of activity** • Project description • Purpose of the research/what we hope the outcomes are • Partners – UNESCO, Apidae, University of Melbourne IDEAS/EVALUATION – ask teachers to please give their feedback or any ideas they have on the focus group throughout the session by writing on a sticky note and placing it on the sheet.	5 min
Activity #1 Key problem and solutions (sticky notes)	Adam/Joelle Adam/Joelle	**Ask people to:** • Please write down the biggest PROBLEM for teachers **in teaching** CC in Vanuatu? Write on your YELLOW sticky notes. • Please write down the number one SOLUTION for teachers i**n teaching** CC in Vanuatu? Write on BLUE sticky notes. Ask participants to come and stick their sticky notes on the wall [ask them to put problems on one side, solutions on the other] ****After all words are on the board we need to GROUP THEM into key categories. **** Brief discussion – *Why are these issues important? What are the main challenges in achieving these solutions? What do you teach on mostly (science, politics, impacts, solutions?) WHY?*	20 min
Activity #1 *Key problem and solutions (Sticky notes)*	Adam/Joelle	*Climate change in education* • Briefly explain the different groups of issues on the board • Then ask people to take a sticker and stick them on the issues groups: • Red stickers for "This is the biggest problem for teachers to teach CC effectively" • Green stickers for "This is the best solution for teachers to teach CC effectively" • Orange stickers for "I would like to know more about this for my teaching on CC" **Brief discussion** – *how would you like to learn more? Teacher training workshops, conferences, reports, training, info/ media packs/toolkits?*	20 min

Focus Group –Teachers –Vanuatu *(continued)*

Topic	Who	Description	Time
Activity #2 Photo sorting	Adam/Joelle Joelle/ AdamRory/ Denis to each facilitate one group	• Split the group into 2 or 3 smaller groups • Explain the activity using the photo grid: people should look at each photo and ask themselves: do they agree with the statement? And place the photos in the boxes according to whether they agree/disagree. • Adam will give example on the photo board by sticking up photos. Example could be: "This makes me think of Vanuatu culture; Agree/Disagree". • Please tell all that there are no right or wrong answers, and you don't have to use all the photos, and if you have an idea that is not on the photo, you can write it on the sticky note and stick it on the board. *This is meant to be a kind of game, so it is light hearted and quite fast!* • Each sorting should take 5 mins, then 5 mins for discussion after each sorting. People should hold up their board and share why they sorted the photos this way. NB – We will give each group a different statement and see how many we can do in the available time. STATEMENTS • "I teach my students frequently about this climate change issue" (Agree/Disagree) – use climate change photos (problems and solutions) – take out media photos • "Teaching this will help students better understand climate change" (Agree/Disagree) – use all photos • "I would like to improve my skills in teaching this climate change issue" (Agree/Disagree) – use climate change photos (problems and solutions) – take out media photos *Discussion* • Is there too much climate change in the curriculum? • Does your school/the curriculum help you to teach climate change? • What resources would help you to teach CC? Textbooks, teacher training, online resources, videos etc.? What materials exist and which are most useful? Why? Is there enough/too much? • Do you feel confident to use the resources you have? What support would help? • Where do you get your CC information from? Media, Ministry of Education, SPREP, etc. *[Joelle/Rory to take pictures of each grid after each sorting exercise]*	40 min
Final discussion and wrap up	Adam/ Joelle	• Wrap up discussion **(address any questions not covered above)** and ensure that important points were covered • Explain next steps of the project (remind them about Facebook Page) • Mobile survey. Ask everyone to get out their phones and Digicel text • Draw for prize money • Hand out taxi stipends	20 min

Focus Group – Community, Vanuatu

16 May 2013, Pele

Topic	Description	Time
Introductions	**Welcome and explanation of activity** • Project description • Purpose of the research/what we hope the outcomes are • Partners – UNESCO, Apidae, University of Melbourne IDEAS/EVALUATION – ask community members to please give their feedback or any ideas they have on the focus group throughout the session by writing on a sticky note and placing it on the sheet.	5 min
Activity #1 Key problem and solutions	**Ask people to:** • Please write down a climate change PROBLEM for your community on your YELLOW notes. *Discussion: What are the biggest challenges for your community in dealing with these climate change problems? Why?* • Please write down a climate change SOLUTION for your community on your BLUE notes. *Discussion* • Is it hard to find these solutions? Why? Why not? • Who makes the decisions about which solutions are used? Why? What happens when these people make these decisions? • Who implements the solutions? Are the solutions effective for you/some/men/everyone? Ask participants to come and stick their notes on the board [problems on one side, solutions on the other] **** After all words are on the board we need to GROUP THEM into key categories. E.g. sea level rise, lack fresh water, cyclone, etc. **** *Discussion* • Why did you choose to write this? • Why are these issues important for the community? • Who decides which issues are important for the community?	10 min

Focus Group – Community, Vanuatu *(continued)*

Topic	Description	Time
Activity #1 Key problem and solutions	*Climate change in my community* • • Briefly explain the different groups of issues on the board "this one is sea level rise, etc." • Then ask people to take a sticker and stick them on the issues groups: **Red** stickers for "This climate change **problem** is the most important for my community" **Green** stickers for "My community **does not manage** this climate change problem well" **Orange** stickers for "I would like to know more about this climate change problem" *Discussion* • Why is this problem so important to your community? • Why do you not cope well with this issue? • What would help you to understand more about this issue? • What would help you do more about this issue? • Why do you want to know more about this climate change problem?	10 min
Activity #2 Photo sorting	• Split the group into 2 or 3 smaller groups • Explain the activity using the photo grid: people should look at each photo and ask themselves: do they agree with the statement? Place the photos in the boxes according to whether they agree/disagree. • Adam will give example on the photo board by sticking up photos. Example could be: "This makes me think of Vanuatu culture; Agree/Disagree". • Please tell all that there are no right or wrong answers, and you don't have to use all the photos, and if you have an idea that is not on the photo, you can write it on the sticky note and stick it on the board. *This is meant to be a kind of game, so it is light hearted and quite fast!* • Each sorting should take 5 mins, then 5 mins for discussion after each sorting. People should hold up their board and share why they sorted the photos this way. STATEMENTS • Our community **needs help** to deal with this climate change issue (Agree/Disagree) – use only CC problem photos • • This is a climate change **solution** for our future (Agree/Disagree) – use only CC solution photos • Our community **manages this climate change issue well** (Agree/Disagree) – use both problem and solution photos but take out media photos *[Please make sure there is time for us to take pictures of each grid after each sorting exercise]* Discussion: Based on issues raised in photo sorting activity.	30 min
Final discussion and wrap up	• Wrap up discussion (address any questions not covered) and ensure important points were covered • Explain next steps of the project (remind them about Facebook Group conversation) • Mobile survey. Ask everyone to get out their phones and Digicel text.	5 min

Focus Group – Media – Vanuatu

17 June 2013

Topic	Description	Time
Introductions	**Welcome and explanation of activity** • Project description • Purpose of the research/what we hope the outcomes are • Partners – UNESCO, Apidae, University of Melbourne IDEAS/EVALUATION – ask media to please give their feedback or any ideas they have on the focus group throughout the session by writing on a sticky note and placing it on the sheet.	5 min
Activity #1 Key problem and solutions (Sticky notes)	**Ask people to:** • Please write down the biggest PROBLEM for media in communicating CC in Vanuatu? Write on your YELLOW sticky notes. • Please write down the number one SOLUTION for media in communicating CC effectively in Vanuatu? Write on BLUE sticky notes. Ask participants to come and stick their sticky notes on the wall *[ask them to put problems on one side, solutions on the other]* **After all words are on the board we need to GROUP THEM into key categories.** *Discussion* • Why are these issues important? • What are the main challenges in achieving these solutions? • What do you report on (science, politics, impacts, solutions) Why? • Are you confident reporting on climate change? Do you feel you have the knowledge to report climate change?	10 min

Focus Group – Media – Vanuatu *(continued)*

Topic	Description	Time
Activity #1 Key problem and solutions (Sticky notes)	*Climate change in media* • Briefly explain the different groups of issues on the board • Then ask people to take a sticker and stick them on the issues groups: **Red** stickers for "This is the biggest problem for media in communicating CC" **Green** stickers for "This is the best solution for media in communicating CC" **Orange** stickers for "I would like to know more about this" *Discussion* • What are your main CC information sources? • Have you reported a story about local people and cc? • Do you report local or international CC issues? • How would you like to learn more? Workshops, conferences, reports, training, info/media packs/toolkits? • Do you feel media have a responsibility to communicate climate change to the public? • How effective do you feel the media is in communicating climate change? How accurate? Why/Why not?	10 min
Activity #2 Photo sorting	• Split the group into 2 or 3 smaller groups • Explain the activity using the photo grid: people should look at each photo and ask themselves: do they agree with the statement? And place the photos in the boxes according to whether they agree/disagree. • Adam will give example on the photo board by sticking up photos. Example could be: "This makes me think of Vanuatu culture; Agree/Disagree". • Please tell all that there are no right or wrong answers, and you don't have to use all the photos, and if you have an idea that is not on the photo, you can write it on the sticky note and stick it on the board. This is meant to be a kind of game, so it is light hearted and quite fast! • Each sorting should take 5 mins, then 5 mins for discussion after each sorting. People should hold up their board and share why they sorted the photos this way. STATEMENTS • What is the best way to communicate climate change with the public in Vanuatu? (Use media/tech photos) • The media is effective in reporting this climate change issue (Use climate change problems and solutions photos) • More media education about this climate change issue would lead to better reporting in Vanuatu (use CC problems and solutions photos) *[Joelle/Adam/Rory to take pictures of each grid after each sorting exercise]*	25 min
Final discussion and wrap up	• Wrap up discussion (**address any questions not covered);** ensure important points were covered • Explain next steps of the project (remind them about Facebook Group conversation) • Mobile survey. Ask everyone to get out their phones and Digicel text • Hand out taxi stipends	5 min

Appendix 2: Focus group and capacity building feedback

Focus group feedback – Samoa

TEACHERS	It is interesting to share ideas and opinions on the issues of climate change
	The programme was good and it gives me a fair idea about climate change
	The activities and discussion based on climate change was very helpful in teaching. Thank you.
	Very good. Need to share ideas more. Make some plans to share ideas.
	Thank you for bringing into everyone's attention that there's a great need in everyone to learn about climate change
	Workshop was very productive and worth coming to. Request a teachers' association on "climate change awareness" to be formed with interested individuals.
	Excellent. I've learnt quite a lot about teaching climate change. Some issues and solutions to teaching climate change.
	A well organised workshop. More are needed. Helpful for everyone especially for this special topic/issue.
	Very effective. Helpful programme which assists us to speak out what we experience in our country. Nevertheless, it has taught me about skills of climate change that should be conveyed.
	It's good for teachers to feel confident about teaching Climate Change and know that many resources are already available in Samoa. Thank you.
	Good using of stickers and coloured papers. Interesting how the photos are attached on the white big paper and how problems are written in different/separate issues from the teachers. Very clear and important matters discussed.
	Love it. It was fun, moving and exciting to hear the locals.
	Need a worldwide update on climate change every month please.
	Thanks very much. It is an important workshop. We got a lot.
	Very helpful. Very fruitful. Very resourceful. Thanks.
	This exercise is very important because we understand and learn more about climate change
	Workshop was great! However it would have been much better if we spent a whole day discussing this issue
	Activities are interesting and we enjoy it a lot. Very helpful in exchanging ideas about climate change.
	I like this meeting because I will elaborate more on climate change issues with the students that I will teach.
	Very interesting exercise. You're doing it in a simple way, not too much writing.
	Good session overall. A lot of good valuable discussion shared hopefully it will come to fruition.
	It's relevant and timely. This has been an interesting and inspiring time, the exchange of ideas has been educational as well.
	Thank you for the presentation. Was quite helpful. I've learned some of the problems facing some teachers regarding the teaching of climate change.
	Thank you for everything but for the second activity we should have been split into four groups instead of two. Overcrowded.
	Activities are fun and appropriate it helps a lot teachers improve our teaching on climate change.
	Interactive and I wish there was more time.

Focus group feedback – Fiji

TEACHERS	Workshops like this create awareness about climate change. Well facilitated.
	Simple yet enlightening. Facilitators are very helpful. A eye-opener on how to teach a topic in a simple and enjoyable manner.
	Thank you for welcome refreshments. Suggestion: Media's role is important to include climate change (TV commercials etc.)
	More workshops should be conducted and more resources should be given to schools on climate change. Interesting session though limited time.
	If it could be a longer session. So much to share and learn in such a short time. If it could include teachers in the pursuit to raise awareness, training and projecting the curriculum.
	Very informative but would have been better if more time allocated. Presentations were really interesting. Facilitators well versed.
	Very interesting workshop, thank you for the great 2 hours we had. However, it could have been an added advantage to us teachers if you could have given us some ideas on how to teach the topic at school.
	More time should be allocated for such workshops.
	The connection of teaching climate change in the classroom and the community. NGO – community are made aware during their meetings (provincial council meetings). Community are already implementing.
	Workshop was great! Learnt a lot because of how the information was given out. The methods used for this session were simple but motivating.
	More workshops/ awareness or professional development to be held at schools. Training of teachers (scholarships and aid should be given) for studies in climate change.
MEDIA	Extend the session times for more discussions and to have debate sessions.
	It was an interesting and interactive session.

Focus group feedback – Vanuatu

TEACHERS	A presentation style I can use to teach CC solutions and problems in the CC. Interesting session.
	This is a good awareness but I feel more time should be given to discuss ways to teach CC
	The workshop is brilliant and should have more of the CC workshops
	Activities done in the workshops are brilliant. We should have more workshops involving practical involvements i.e. food preservation
	Obtain information about CC. Identify problems and solutions on how to address CC issues. To teach children about basic info on CC
	This workshop is very good because it helps us to know how to manage/control the big issue of CC
	Tonight's workshop is brief. There should be frequent in depth workshops to really equip teachers
	Very interesting session. We need more of such workshops to equip us with the knowledge of CC and the skills to teach it
	The session was very interesting and I really enjoyed it and we hope that we will get assistance from UNESCO
	Good food and good discussion. Thanks a lot for your time and cooperation we have together.
	We need to have more consultation on the islands
	Exciting great interaction and discussion on CCE knowledge
	Can have more activities on this issue
	The use of stick on notes and photographs is an effective method in teaching this workshop
	More time needed for each area covered. Each area covered should be looked at more specifically instead of giving of ideas on a general basis.
	Good food and great activities but too short
	Meeting was good a lot of fun activities
	Great! I enjoyed the session. You need to consult curriculum development centre to find out what there is to avoid duplication
	More mitigation training
	Exciting and interesting especially the activity is fun. Can we have longer timeframe to mingle?
	I learned new activities that I can do with my students
	Mi likem workshop is be mi faenem out se emi rili wan big issu. Mi wantem attendem sam more workshop olsem we I concernem climate change
	Good workshop but too short. Detail more in topics to teach ie erosion, data that shows changes. Good group discussion showing ideas on teaching skills
	This program is interesting because it shows the lack of knowledge and responses about the CC issue in our country
	It is very good and wish to have more of this type of workshop
	Good short workshop. Need to get the answer to problems identified soon
	The session was good as we have identify the major problem to do with teaching climate change which are resources and training. That means some text books should be provided to help teachers teach CC.

Focus group feedback – Vanuatu *(continued)*

MEDIA	Very good; understandable
	Would have been better to start at 10:30
	2 hours not enough – good training
	Good for journalists to participate in CC workshops/seminars
	Very good workshop. Constructive and informative for Vanuatu journalists
	More workshops of this nature please!
	The best ever and brief workshop on CC. Please make it longer next time
	Excellent to involve media in the process. 1st of a kind, need more
	The exercises were a great to get attendee participation. The workshop provided a good forum for the media of Vanuatu to discuss CC

Capacity-building training feedback

DAY 1	Too tight a programme. Too much to be absorbed, better end of each session than questions.
	Everyone participate in training must travel to the fieldtrip. Also provide information or notes at the time of the training.
	Yes I would like to share about the curriculum that climate change must start. It covers all the levels.
	Conducting was well done and organised. Just a suggestion to accompany us with handouts showing the PowerPoint process. The process was most attractive.
	It was a very interesting training and very impressive activities were carried out really well. Hope to attend more trainings on CC in the future
	No, everyone worked well.
	It was a good training, well prepared, etc… well done! Good luck to you guys! Thanks for the cameras!
	Yes, need more training and need to provide handout for more information
	Provide handouts
	The involvement of the SPARCK, and the SPREP and UNESCO gives me the opportunity to go further into finding out about their priorities. I will certainly find them in the future.
	Interesting presentation. Need to have hardcopy for all presentation.
	It would be more helpful if we are provided with video watched and the package the same time of the workshop
	More workshops
	Thanks to all the presenters for giving us lots of ideas to help us
	The training was interesting, but the problem was the time that was spending was too short
	Need more training or workshops; resources like posters are needed
	Hope to hear from you again (soon) because we are really concerned about climate change for the future generations to come!!
	The training was very important. It gives a lot of information to understand CC, by this way I can help the students and the community as well.
	Provide handouts of notes because not everyone has email.
	Need more training like this because its very fun, useful, and helpful for my teaching career.
	Send info packs, resources to schools. Inform media/TV, When will be the next workshop? Invite Savai'i and Upolu.
	Everything ok
	Everything was clear
DAY 2	It was a different experience to work with the community and it was fantastic.
	The whole village should participate. AWESOME!!
	Nah! Seki everything Adam! :) haha
	It's an awareness programme. It's vital for all the people of Samoa as a whole
	Need more training workshops

Appendix 3: Mobile phone survey questions

Example of the mobile phone survey in Vanuatu with all three target groups: community, teachers and media.

VANUATU – COMMUNITY	
Questions	**Response options**
Q1 – Are you male or female?	• Male • Female
Q2 – How old are you?	Open ended response
Q3 – Do you normally live in:	Port Vila Woriaru Pilura Worisevu Lolamor Nguna
Q4 – Do you feel you UNDERSTAND climate change (CC)?	Yes, a lot Yes, somewhat Not sure Only a little No, not at all
Q5 – What do you think is the biggest local climate change problem?	Increase in extreme weather Sea Level rise Tsunami Earthquakes Coastal erosion None Don't know
Q6 – What is MORE IMPORTANT than climate change (CC)?	Economy Other (Schools, health, culture) CC is LEAST important CC is MOST important
Q7 – Are you CONCERNED about Climate Change?	Yes, a lot Yes, somewhat Not sure Only a little No, not at all
Q8 – Do you think we can do anything to deal with climate change?	We can and must We can but might not We can but won't We can't change Don't know
Q9 – Do you feel threatened from climate change?	Yes, a lot Yes, somewhat Not sure Only a little No, not at all
Q10 – What do you think causes climate change?	Human processes Partly human/partly natural Natural processes God Climate change does not exist Don't know
Q11 – Have you taken any actions to adapt to climate change?	Yes, many Yes, some Not sure Only a few No, nothing

Example of the mobile phone survey in Vanuatu with all three target groups: community, teachers and media *(continued)*

VANUATU –TEACHERS	
Questions	**Response options**
Q1 – Are you male or female?	• Male • Female
Q2 – How many YEARS have you been teaching?	Open ended response
Q3 – What SUBJECT do you teach?	Open ended response
Q4 – What SCHOOL do you teach at?	Open ended response
Q5 – Do you feel you UNDERSTAND climate change (CC)?	Yes, a lot Yes, somewhat Not sure Only a little No, not at all
Q6 – What is biggest CC PROBLEM for Vanuatu:	Extreme weather Sea Level rise Tsunami Earthquakes Coastal erosion None Don't know
Q7 – Are you CONCERNED about Climate Change?	Yes, a lot Yes, somewhat Not sure Only a little No, not at all
Q8 – Do you think we can DO anything about climate change?	We can and must We can but might not We can but won't We can't change Don't know
Q9 – Is teaching about climate change a PRIORITY for you?	Yes, a lot Yes, somewhat Not sure Only a little No, not at all
Q10 – Which SUBJECT should teach climate change?	History Geography Sciences Integrate in all subjects Does not matter
Q11 – What would be the BEST thing to help you teach CC?	More info on science More info on impacts More info on solutions I don't teach CC
Q12 – What RESOURCES would help you teach CC better?	Textbooks Teacher training Online resources Videos Media

Example of the mobile phone survey in Vanuatu with all three target groups: community, teachers and media *(continued)*

VANUATU – MEDIA	
Questions	**Response options**
Q1 – Are you male or female?	• Male • Female
Q2 – How many years have you worked in media?	Open ended response
Q3 – Which TYPE of media do you mostly work in? (answer only one)	Print News Print Magazine Online Radio Television
Q4 – Do you feel you UNDERSTAND climate change (CC)?	Yes, a lot Yes, somewhat Not sure Only a little No, not at all
Q5 – What do you think is the biggest local climate change problem?	Increase in extreme weather Sea Level rise Tsunami Earthquakes Coastal erosion None Don't know
Q6 – What is MORE IMPORTANT than climate change (CC)?	Economy Other (Schools, health, culture) CC is LEAST important CC is MOST important
Q7 – Should media take a LEADING ROLE in raising awareness about CC?	Yes, a lot Yes, somewhat Not sure Only a little No, not at all
Q8 – In general, do you think the media EFFECTIVELY COMMUNICATES CC issues?	Yes, a lot Yes, somewhat Not sure Only a little No, not at all Don't know
Q9 – How ACCURATELY is CC information reported by Vanuatu media?	100%-always accurate 80%-most of the time 50% – half the time Below 50%-mostly not accurate Unsure
Q10 – Biggest PROBLEM reporting CC is:	Other stories more important Too scientific Public not interested Editor not interested I am not interested
Q11 – What would HELP you to report on CC?	More science on CC More info on impacts More info on solutions Nothing, I know all I don't report on CC
Q12 – What would be the BEST thing to help build capacity in Vanuatu media? Please tell us in English.	Open ended response

Appendix 4: Examples of SPARCK survey promotions

Appendix 5: Screenshot of the SPARCK Facebook page

Appendix 6: SPARCK capacity-building training schedule

Day 1: *3 September 2013, 8:30-1:30pm (Ministry of Education, Sports and Culture)*

Time	What	Who
8.30-8.35	Prayer Facilitator to introduce Sue Vize and Denis Chang Seng, UNESCO	Tamasoalii Saivaise (MESC) Joelle Auffray (Apidae)
8:35-8:45	Welcome and introductions (10)	Sue Vize (UNESCO) Denis Chang Seng (UNESCO)
8.45-9:00	**Session 1: BACKGROUND AND KEY FINDINGS OF SPARCK**	
15m	• Overview of SPARCK • Key conclusions for teachers in Samoa • Compare findings between Fiji/Samoa/Vanuatu for 3 sectors • Purpose and objectives for capacity building	Adam Bumpus (University of Melbourne/Apidae)
9:00-10:00	**Session 2: SCIENCE AND ADAPTATION OPTIONS FOR SAMOA**	
10m	*Climate change in the Samoan curriculum* • How it relates to SPBEA exams	Tamasoalii Saivaise
7m	*Climate science impacts for Samoa* • PACCSAP Science – key messages for Samoa • Link the science to any weaknesses/problem perceptions identified through SPARCK	Adam Bumpus
13m	*Impacts, risk and resilience* • Traditional knowledge case studies and calendars	Denis Chang Seng
10m	Mangroves and adaptation	Carlo Iacovino (SPREP)
10m	Case study and thinking ahead to tomorrow: Community impacts (Faleaseela)	Tapulolou Tuailemafua (GCCA)
10m	Q&A from teachers	Presenters
10:10-10:30	MORNING TEA	
10:35-11:50	**Session 3: CLIMATE CHANGE EDUCATION – RESOURCES and TOOLS for the CLASSROOM**	
20m	*Resources for CC education* • Show some examples of existing resources and where to find them • Show SPC/GIZ Climate Crab video	Denis Chang - Seng
5m	*Home and Expert Activity* • Overview and explanation of activity	Adam Bumpus
40m	*Home and Expert Activity* • Teachers examine and test various resources from GIZ/SPC toolkit, make comments and suggest ways of using it in the classroom.	Teachers
10m	Discussion	Adam Bumpus/ Joelle Auffray
11:50-12:20	LUNCH	

Day 1: *3 September 2013, 8:30-1:30pm (Ministry of Education, Sports and Culture)*

Time	What	Who
12:20-1:15	**Session 4: HOW TO PLAN A CLIMATE ACTION DAY**	
5m	*Climate Action Day:* • Overview and explanation of activity	Adam Bumpus
40m	*Climate Action Day Carousel Activity* • Stations representing different ways of incorporating a climate action day with various teaching topics/activities are set up around the room. Teachers will get into groups and rotate to each station adding their ideas as they go.	Teachers
10m	Discussion	Adam Bumpus
1:15-1:25	FINAL Q&A FROM TEACHERS	Presenters
1:25-1:30	THANK YOU & CLOSE	

Day 2: *4 September 2013, 8:30-2:30pm (Falease'ela)*

Time	What	Who
7:45am	DEPART APIA (FROM MESC)	
8:30	Arrival/Gathering community	Tapulolou Tuailemafua
8:45-9.10	Prayer and introduction ceremony (15) Welcome and introductions (10)	Tapulolou Tuailemafua Denis Chang Seng Translator – Perelini Hamuferi (UNESCO)
9:10-9:40	**Session 1: BACKGROUND AND KEY FINDINGS OF SPARCK**	
20m	• Key conclusions for teachers and community in Samoa • Explanation/justification for capacity building • Overview of what was done in the classroom yesterday	Adam Bumpus
10m	*Show SPC/GIZ Climate Crab video* • Discussion – how is this video relevant for the community?	Adam Bumpus
9:40-10:30	**Session 2: CLASSROOM TO COMMUNITY**	
10m	*Overview and explanation of activity* • Give example	Adam Bumpus
40m	• Teachers and community members break off in groups; together teachers come up with 3 CC topics/activities that they would like to teach based on what you learned yesterday, and the community members identify 3 CC related issues in the community. (30) • Groups report back/discussion (10)	Teachers/ Community
10:30-11:00	MORNING TEA	
11:00-12:30	**Session 3: COMMUNITY PHOTO TOUR**	
10m	*Overview and explanation of activity* • Give example	Adam Bumpus
40m	• Community members lead the tour with community members/teachers taking 3 photos of 3 different things of what they see and want to discuss later on.	Teachers /Community
30m	• Spokesperson presentations -Each group has 5 minutes to show their top 3 pictures.	Teachers /Community
10m	Discussion	Adam Bumpus
12:30 -12:40	FINAL Q&A	Adam Bumpus / Denis Chang - Seng
12:45	THANK YOU & CLOSE	Adam Bumpus/ Denis Chang - Seng
13:00	LUNCH	
2:00pm	DEPART FALEASEELA (BACK TO MESC)	

Appendix 7: SPARCK media coverage and press releases

Date	Item	Source	Link
26 March 2013	Online article	Samoa Observer	www.samoaobserver.ws/other/community/4110-igniting-a-sparck-on-climate-change
17 May 2013	TV	Fiji TV	www.facebook.com/photo.php?v=10151577780238930&set=vb.212047862273859&type=2&theater
20 May2013	Online	Fiji Government website	N/A
21 May 2013	Radio	Brisvaani Radio	N/A
24 May 2013	Online	Islands Business	http://www.islandsbusiness.com/news/fiji/1320/sparck-sharing-perceptions-of-adaptation-resilienc/
24 May 2013	Online	The Jet Newspaper	http://www.thejetnewspaper.com/2013/05/24/sparck-sharing-perceptions-of-adaptation-resilience-and-climate-knowledge-a-unesco-project-in-the-pacific/
24 May2013	Online	Pacific Islands News Association	N/A
24 May2013	Online	Silo Breaker	N/A
26 June 2013	Online	PACMAS	http://www.pacmas.org/blog-post/unesco-workshop-what-are-the-biggest-problems-in-communicating-climate-change/
18 July 2013	Online	Pina	http://www.pina.com.fj/?p=pacnews&m=read&o=50966232051e7633bd1dd15acbc915
13 September 2013	Online	Samoa Observer	http://www.samoaobserver.ws/education/6969-climate-change-a-difficult-topic

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