SCOPING MEETING

"Communities and Coral Reefs: Managing for Resilience"

UNEP World Conservation Monitoring Centre (UNEP WCMC) in partnership with the International Coral Reef Action Network (ICRAN)

Hosted by South Pacific Regional Environment Programme (SPREP)

Held in Apia, Samoa
26-27 January 2010

Workshop Report

UNEP WCMC ICRAN International Coral Reef Action Network IUCN The World Conservation Union UNEP

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Introduction

Climate change variability has emerged as a significant, overarching and very real threat to tropical marine ecosystems globally. Its potential to cause extensive mortality to coral reef ecosystems and impact the communities who depend on them for a range of vital services (including food and income) is now little disputed. While this global phenomenon is largely beyond the control of local marine and coastal resource managers, meaningful action can be taken to respond to inevitable local impacts.

Effective management can ameliorate or exacerbate the situation and policy makers, conservationists, scientists and the broader community are increasingly calling for adaptive measures and actions to restore and maintain the resilience of tropical marine ecosystems to climate change, in order to avoid worst case scenarios.

There is a critical need to align current science, development and institutional processes for the immediate implementation of local management strategies that strengthen the adaptive capacities and reduce the vulnerability of ecosystems and communities that are increasingly stressed by climate change.

It is important that these measures and strategies build upon and add value to existing management activities (e.g. MPAs), stakeholder networks and site based initiatives which collectively generate global benefits by furthering the resilience of ecosystems and people.

As a result of these imperatives, ICRAN developed a concept note entitled “Communities and Coral Reefs: Managing for Resilience”. The concept is predicated on the understanding that preparing for climate change will be challenging. Vulnerable people will need guidance and support to anticipate the impacts of climate change and implement appropriate adaptation strategies if they are to sustain their livelihoods and quality of life in the future.

Equally, the note recognizes that meaningful action to support adaptation and strengthen management for socio-ecological resilience IS underway (through a variety of initiatives ranging from marine protected areas and locally managed marine areas, to livelihood enhancement and diversification initiatives). Managing for resilience recognises the opportunities provided by effectively managed coral reefs in supporting the environment and dependent human communities to absorb shocks, regenerate and reorganise so as to maintain key functions, economic prosperity, social wellbeing and political stability. Building the ability of reef users to anticipate and plan for climate-related changes while ‘buying time’ for ecological recovery through effective local reef management creates powerful and cost effective opportunities for valuable action to cope with shocks and variability.

A core element of the concept is strengthening ‘community vision’ using climate scenarios and projections relevant to local scales to support adaptive capacity development. At the terrestrial level, the application of climate change models to particular locations has enabled communities to learn from and visit sites that might best represent their environment in the future, and in the face of climate change. Such projections, adapted for the marine environment could help coastal communities to prepare for likely changes. The approach depends on comprehensive data that includes both ecosystems and socioeconomic variables, and which recognizes linkages between ecological and socioeconomic vulnerability and adaptation.

These scenarios can be used to help vulnerable coastal communities identify their needs and opportunities for alternative or additional livelihoods in the face of climate change (including how to

benefit sustainably from favourable changes); facilitate linkages to key national service providers and across sectors and disciplines; raise awareness of the inherent linkages between ecological and social resilience; and realise the potential of local management action to provide opportunities for meaningful local and global benefits.

Widely shared, the concept note triggered significant interest within the international development and environment community. With the logistical support of the South Pacific Regional Environment Programme (SPREP), who kindly hosted the meeting, and funding provided generously by UNEP, ICRAN and the IUCN Working Group on Climate Change and Coral Reefs, the workshop provided an important opportunity to debate the precepts of the concept note, analyze the successes and failures of existing adaptation and related projects and initiatives, and scope action to address comprehensively and systematically identified needs and gaps.

Specifically, participants discussed the needs and priorities of reef dependent communities and countries given the projected impacts of climate change in coming needs; and the processes and frameworks required to support the development of adaptive capacity and build resilience at local, national and international levels. The workshop also explored how to enhance implementation of existing adaptation plans and actions to ensure that they remain grounded in the strengths and aspirations of communities while steeped in strategy and science.

This report represents the sum of the workshop discussions.

International Coral Reef Initiative (ICRI)

The Governments of Samoa and France with support from Monaco, will co-host the Secretariat of the International Coral Reef Initiative (ICRI) until December 2011. ICRI is a voluntary partnership of countries and organisations with coral reef interests, who collectively seek to advance the coral reef agenda and who work towards the implementation of an action framework of shared priorities relating to coral reefs and associated ecosystems. These workshop discussions here today are timely as the ICRI Secretariat will be updating this framework in 2010 to include a focus on climate change and adaptation issues.

International Coral Reef Action Network

ICRAN is an operational network of ICRI charged with supporting the implementation of the action framework and building coalitions for the implementation of priority actions. ICRAN has been noted as a convener, a broker of multi-disciplinary partnerships, and as a mechanism for coordinating discussion and targeted action around critical coral reef issues. In this vein, ICRAN has worked to build interest and opportunities for collaboration around the shared challenge ***to strengthen the adaptive capacities and reduce the vulnerability of reef ecosystems and communities that are increasingly stressed by climate change****.*

ICRAN is hosted by the One Ocean Programme of the UNEP-World Conservation Monitoring Centre in Cambridge, UK.

WORKSHOP REPORT

Day 1 – Tuesday 26 January 2010

Session 1 – Workshop goals and objectives

The opening presentation by Nicola Barnard (ICRAN/UNEP-WCMC) provided background information on the 'communities, climate change and coral reefs' concept note (see Annex 3) that gave rise to the workshop, and highlighted the objectives and expectations for the ensuing discussions.

The starting points and principles that guided the thinking behind the concept note were shared as a basis for discussion. These include:

- Recognition that coral reefs are threatened by a suite of localised non-climatic impacts, and that these combined with the impacts of climate variability and long term global climate change threaten the existence of these important ecosystems.
- In concert with this, the dependence of coastal communities on the continued provision of goods and services from coral reef ecosystems to support part, if not all of their livelihoods is highly significant. Many communities stand to be critically affected by the degrading quality and functioning of these habitats.
- While the global phenomenon of climate change is largely beyond the control of local coastal resource managers and communities, and the benefits of any global decisions relating to green house gas emissions will take time to feed down to the local level, there is meaningful action that can be taken to respond to the inevitable local impacts.
- The effective management of ecosystems can support the enhanced resilience of those ecosystems and may buy time for communities to reorganise and diversify their livelihoods in a changing climate.
- There is a need to link and connect the existing core strategies for adaptation to climate change, which tend to focus on either poverty and livelihood issues; ecosystem management and restoration; or disaster risk reduction, and these should be tackled in a more integrated manner for greater impact.
- Building capacities to manage social and institutional change is as important as preparations for resource degradation. Action that facilitates people centred development to explore future constraints and help people to take advantage of future opportunities is therefore crucial.
- Climate change and adaptation are now core thrusts for many donors and organisations, and there has been a recent proliferation of adaptation projects in the form of technological, infrastructure, regulatory or market based actions, which has the potential to place additional strain on the existing resources and capacity within governments and may in some cases increase vulnerability.
- New initiatives must avoid adding to this growing problem and build on the meaningful action that is already underway. For example, Marine Managed Areas which reduce local stresses on coastal ecosystems, and ongoing livelihood diversification and enhancement activities that broaden opportunities for communities are critical tools to help us respond and adapt to climate change, and these need to be recognised as key pieces in the armoury.

With these considerations in mind, Nicola highlighted the interest of ICRAN to explore with participants the local needs and gaps, and to encourage the exchange of information on existing projects, networks and processes already laying the foundations for the improved resilience of

people and marine and coastal ecosystems, in order to define how these might be better connected, strengthened and supported.

The need to better influence the necessary shifts in behaviour at a range of scales, and to increase understanding and awareness of likely climate change impacts on coral reefs and associated ecosystems was highlighted as key to building incentives for a 'no regrets' approach to sustainable development and ecosystem management and to catalysing urgent, yet systematic adaptation action.

In this vein, four core focal areas *to strengthen the adaptive capacities and reduce the vulnerability of reef ecosystems and communities that are increasingly stressed by climate change* were put forward. This combination of objectives, underpinned by the idea of managing for socio-ecological resilience, has generated significant interest globally and particularly within the Pacific in recent months in terms of responding to existing commitments and needs:

- To develop the capacities of national and local stakeholders to predict and cope with climate change and other exogenous factors;
- To integrate forecasts and predictions into policy and institutional frameworks to make these responsive and to pave the way for applied adaptation;
- To promote sustainable livelihoods consistent with sustainable use and conservation objectives;
- To channel cutting edge science and research into village actions for climate change adaptation through knowledge networks and exchanges.

Nicola highlighted how the lessons and experiences gained from previous projects and activities had informed these objectives, providing an example of the Sustainable Livelihood Enhancement and Diversification work undertaken in South Asia with Integrated Marine Management (IMM), IUCN and a host of local partners which led to the development of an adaptable framework through an iterative joint learning a process with coastal communities. The approach helped to identify the complex nature of people's livelihoods, helped people to understand their past successes, strengths and aspirations, and formed critical linkages to service providers to allow the diversification of their livelihoods away from reef dependency. Teams and communities involved in this initiative reported greater levels of participation and success, and highlighted that a process of continued learning had been initiated which allowed people to see themselves as part of the solution to new challenges, and motivated them to explore and see the need for change, essentially building their adaptive capacity.

Additionally, an interesting approach used within the UNDP GEF "Sustaining Agro-biodiversity in the face of Climate Change" full sized project in Tajikistan was shared, which included the use of a 'homologue tool' to identify and analyse similar environmental niches for the exchange of skills and experiences between communities to enhance coping, including the application of climate change models to these locations to represent their environment in the future and provide real world experience of the likely changes to goods and services provided by the environments that these communities were dependent upon to inform and incentivise sustainable development.

The participants were invited to explore how such 'process' based activities, which allow the integration of analytical decision making tools to reduce risk based on local contexts, might be scaled up or translated to support and catalyse adaptation at the community scale in the tropical coastal realms.

Finally, the proposed agenda for the workshop and the objectives for the workshop itself were set out:

- To examine gaps and needs relative to climate change adaptation in coastal communities dependent on coral reef ecosystems.
- To identify ways to strengthen and align ongoing community adaptation processes with current climate and coral reef management science.
- To define next steps and commitments required to respond to needs and gaps, and support practical application in the field.
- To identify and map linkages with key ongoing activities and initiatives.
- To consolidate a coalition of practitioners committed to advance the activities proposed by the workshop.

SESSION 2 – Situation Analysis

In order to contextualise discussions, presentations were made by SPREP and UNDP to set out activities, priorities and gaps relating to climate change adaptation (and mitigation) activities in the Pacific at the regional, national and local levels.

The presentations[1] were as follows:

- *Current Climate Change and adaptation projects in the Pacific region: a systematic approach?* Espen Ronneberg, Climate Change Advisor, SPREP.
- *Advances towards climate resilience in a national context: priorities and gaps.* Gabor Vereczi, UNDP Regional Technical Advisor for Climate Change and Adaptation.
- *Translating science and research into village action for adaptation to climate change: what do communities really need?* Kevin Petrini, Climate Change Adaptation Officer, GEF SGP Community Based Adaptation Programme (based in Samoa) and Sholto Fanifau, GEF Small Grants Programme (Fiji).

Key observations and discussion points following the presentations included:

- The Pacific Islands Framework for Action on Climate Change was endorsed by leaders for the period 2006 – 2015, establishing priorities for action. Adaptation is a major focus of the framework and the need for comprehensive approaches is recognised at the political level.
- Capacity in national offices responsible for climate change is developing, with a move towards a more coordinated and higher level office in charge. Some countries have a full department for climate change, but there remains a need to better integrate climate change issues into governance.
- Water resource management, coastal resource management and infrastructure, and food production and food security were identified as broad focal areas for adaptation via disaster risk reduction, informing the regional Pacific Adaptation to Climate Change (PACC) project. National consultations have been conducted with support from UNDP to build consensus around these focal areas, and to identify suitable sites for implementation in 2010 (e.g. 'climate proofing' the circum island road on Kosrae).
- PACC (2006-2015) is supporting adaptation in the region through a large scale programme (US$33 million) including technical backstopping, learning by doing and sharing of information and knowledge between participating countries.
- The exchange of lessons and experiences between countries/islands can inform adaptation, however limited capacity to modify these lessons for the individual context presents a major challenge. Technical backstopping is a key capacity gap, and there is a need to co-opt

[1] All presentations from the workshop will be made available to participants via www.sendyourfiles.com.

expertise from across the region or internationally in order to build technical capacity within the region and link science with practical action on the ground.

- It is important to match country/community needs with the priorities of bilateral sources/funding opportunities (e.g. ICCAI, PALM, Cool Earth, EU, etc.) to prevent an over-focus in particular areas, and to have the cooperation of donors in this regard. This must include reconciling success indicators of agencies with the values of communities. SPREP facilitates a regular meeting of a committee in Suva, Fiji to try to optimise the support that the region receives.
- Regional efforts must link more effectively to National Adaptation Programmes of Action (NAPAs) and National Biodiversity Strategies and Action Plans (NBSAPs) where adaptation priorities are already identified.
- There is a need to reduce emphasis on assessment in the Pacific region and to move towards action, especially in areas where assessments have already been undertaken.
- The link between community needs and regional processes is difficult, but developing this is essential to generate the political buy-in required to scale up activities, and can help avoid mal-adaptation by linking to regional scale assessments of sustainable opportunities and ensuring greater understanding of influences driving the wider economy and society.
- Climate change is no longer just an environmental issue, it is a development issue posing a risk to the attainment of all Millennium Development Goals (MDGs) – requiring greater integration of climate change information into all sector activities. Adaptation is development with a vision of the likely risk. The environmental and socio-economic feasibility of adaptation activities must be assessed, and a plan elaborated to manage and monitor the process.
- There is a growing tendency, visible in every sector, to attribute climate change to any development or environmental issue. However, climate change only exacerbates the challenges and shortfalls that existed before from ineffective implementation of policies and programmes. Adaptation must not be used as a diversion from ongoing initiatives and efforts which are responding to these baseline environmental and development issues.
- Climate change may however present opportunities for reaching conservation goals, encouraging greater response to the challenge of a diminishing resource base, encouraging better reporting on environmental and socio-economic issues, and improving disaster risk planning and response.
- Past failures are repeated over and over often because the benefits in the short term override the long term value of change (e.g. hotel on the beach front makes more money). Behavioural change is needed to make the substantial lifestyle changes to respond to climate change, and understanding how to build incentives and support this change is important. Modelling has a role in this, but projections must be brought into closer timeframes to make them less abstract. Furthermore, project based activities in adaptation which are tied into project cycles do not provide sufficient time to support behaviour change, and longer term sector wide approaches are required.
- If a household can identify a livelihood alternative or supplement their existing livelihood, their perception of their capacity to adapt is higher. Fishing is often considered the default livelihood in coastal communities raising the query of a 'threshold' for adaptation in different communities and ecological contexts (e.g. In Australia, where you can find other resources, it is still difficult to change longstanding values and jobs, given the cultural identity associated with livelihoods). Cultural ties to identity based on particular livelihoods (such as fishers) mean that people are unlikely to sever ties with them completely.
- Humanity has constantly adapted to a variable climate, and island communities are highly evolved in this regard. It is important to ensure that livelihood diversification processes are steeped in an understanding of long-term climate change and livelihood vulnerability, and that training and service provision is provided to allow sustainable change. Information on

climate change should be added on top off existing processes to build people's understanding of where they have come from, where they are at now, and who is responsible for the state of their resources. Importantly, communities must be enabled to reflect on past change, and future visioning information must be fed effectively into larger development processes.

- In light of the critical role played by coral reefs in supporting coastal livelihoods and communities, and their vulnerability to climate change, these ecosystems are considered the best example of a 'no regrets' policy to reduce human stressors and build capacity for Integrated Coastal Zone Management (ICZM).
- Improving understanding of climate change impacts on the provision of coral reef goods and services through education, and participatory local management to reduce non-climatic stressors is a macro level strategy, which at this stage is not strategically implemented at the ground level in the Pacific in light of funding, personnel and available capacity.

SESSION 3 – Managing for Resilience: Tools and approaches

Session 3 explored the notion of ecosystem based adaptation and the science of socio-ecological resilience in the context of coral reefs and communities in more depth. Do resilient reefs support resilient peoples?

Presentations included:

- *Reducing vulnerability to climate change through local livelihood enhancement and diversification: Strengthening ongoing activities.* Ben Cattermoul, Integrated Marine Management Ltd.
- *A framework for social adaptation to climate change: reducing fragmentation in adaptation responses.* Jerker Tamelander, Oceans and Climate Change Coordinator, IUCN / IUCN Climate Change and Coral Reef working group.
- *Resilience-based management of coral reefs and associated ecosystems: building science into management strategies.* Ramón de León, Manager, Bonaire National Marine Park

Ben Cattermoul, social development scientist working for Integrated Marine Management Ltd, looked at processes and approaches that have been developed with coastal communities to change behaviours and how these can support longer term community adaptation. He drew on lessons and experiences emerging from the Sustainable Livelihoods Enhancement and Diversification project implemented in five countries in South Asia through the EU-funded Coral Reefs and Livelihoods (CORALI) programme, and opened up discussion around resilience from the economic livelihood perspective.

Jerker Tamelander, IUCN's Oceans and Climate Change Coordinator, presented information on IUCN's "framework for social adaptation for sustaining tropical coastal communities and industries in the face of climate change" and how these principles might be applied, or are being applied in practice.

Ramón de León, Manager of Bonaire National Marine Park, representing the IUCN Coral Reefs and Climate Change working group, provided an overview of his experiences of incorporating resilience principles into management strategies around coral reefs and associated ecosystems, and how reef management decisions can be influenced by the introduction of climate change considerations.

Following these presentations, a **Participant Roundtable** allowed participants to reflect on the information and experiences provided by the presentations and to identify key issues and concerns, including the following:

- The notion of resilience moves us beyond the preservation of the '*status quo*' to maintenance of ecosystem function to support the change process. Systems will degrade over time. As such, climate change adds urgency to the need for ongoing management activities. It is important to ensure that the processes that allow us to maintain those ecosystems over time are supported. There are a suite of factors that will be different as a result of this outlook and perspective (e.g. success indicators).
- Resilience is dependent on time – our baselines need to reflect mortality over time on a continuum rather than a one off snap shot. How can we access information about how these systems have been/will be affected to feed into baseline information?
- An important predictor of resilience is related to how people perceive risk. Information is required on a range of resolutions (e.g. from accurate predictions to managing for most likely scenario) and capacity must be built to use and apply this information. In general, men have fewer identities than women which can affect them during adverse conditions – women are ranked higher in terms of their adaptive capacity because of their greater number of identities and their flexibility in exploiting opportunities associated with each identity.
- Much of the financial resources made available in the Pacific presently are labelled as Climate Change funds, creating a focus on this issue in terms of accessing funding for new initiatives. However, the ongoing standard development and conservation projects are already building adaptive capacity. How can resilience efforts support ongoing activities – what support is needed?
- An action approach is needed to understand project failures better, understand the status of existing risks and management approaches and how climate change will add to this. Often strategies are poorly defined and conceived.
- It is important to understand on a country by country basis how governance and resource management decisions are being made, and how processes are being developed and strengthened in the near and longer term, as this governance is the framework guiding adaptation. There is often disconnect between agreed management processes and actions (e.g. Pacific has agreed to have Community Based Adaptation (CBA), but there are none of these in operation).
- The greatest value of Locally Managed Marine Areas (LMMAs) in the Pacific was noted as potential to support adaptation of communities given that they are mostly small, and are not necessarily designed to have permanent closed systems. The LMMA networks (or other co-management areas) have the potential to support CBA in countries where there are customary approaches and tenure, becoming the national management system. However, the scaling of these unique features to a national level has never been done and to date activities tend to be focused site by site.
- Community management alone will not address ecosystem issues but they are the building blocks of a response. In this vein, LMMAs are not a sufficient approach in the broader context of climate change, and governance in a series of nested approaches must be considered, looking at the threats and opportunities of climate change and exploring how responses to these can be scaled up.
- To effectively scale activities up to the national level, people need to see tangible benefits, allowing action to be demand driven. Exponential growth is possible if the right approaches are used (e.g. community forestry has become such a movement that action to conserve forests has spread). The challenge is to demonstrate short term benefits from activities designed with long term goals, which lay the foundations for change and adaptation.

- Adaptation must be made less daunting to stakeholders. The learning and lessons from activities must be made available for others, and efforts linked up so that these ideas can spread and propagate through a community.
- There does not need to be one solution for adaptation and projects need to approach the same problem from many perspectives (within a broader strategy). Indeed high redundancy is needed to spread risk. Projects must operate through government no matter how weak, and through communities no matter how complicated. This is an essential part of adaptation strategies. It is important however, not to allow adaptation projects to distract communities from the work they are already doing to strengthen resource management and to ensure that activities are tied into key priorities for ecosystem based management.
- The message of climate change must be communicated to raise the profile of existing activities with donors and governments while keeping communities and managers on track with existing processes. Consultation fatigue is a very real problem. Everyone is demanding more concrete action on the ground.
- There is an inevitable lag time in people embracing new risks. The term 'climate change' is relatively new and appropriate language must be developed to respond to concerns of various stakeholders and sectors - need to identify an angle that can help people take on the challenge of adaptation (e.g. In Australia, using the term 'future proofing' helped to engage industry in working together to adapt to climate change where previous efforts had been poorly received).
- Tools, experience and knowledge exists on many levels but the challenge is to integrate these more effectively. Each sector faces the same challenges and is working in parallel with limited exchange.

Day 2 – Wednesday 27 January

SESSION 3 continued – Managing for Resilience: Tools and approaches continued

Discussions around how reef management decisions are being guided in practice by climate change science and projections were continued on Day 2 with presentations by:

- Dr. William Cheung, University of East Anglia - *Modelling climate change influences on productive sectors in tropical marine ecosystems: the value of scenarios for adaptation*;
- Dr. Myles Fisher and Dr. Sam Fujisaka, International Centre for Tropical Agriculture (CIAT) - *Application of the homologue approach in the terrestrial environment: guiding applied action***.**

This session focused on challenges relating to modelling climate change information and examples of where this has been applied and how the information was used to inform scenario development and visioning. The presentations explored:

- The role of the models in informing and influencing the development and adaptation process. Is there a place for this type of approach in the coral reef context to catalyse applied adaptation?
- How are reef management decisions being guided by climate change models and projections currently?
- How do we go beyond what already exists?
- How can socio-economic information be incorporated into adaptation scenarios for greater relevance?

Key discussion points and observations following the presentations included:

- Simple models to increase understanding of what is involved in planning adaptation in the region have been effective learning tools. There is a need to scale down available models and scientific assessment techniques for relevance at the local context, and to translate this information for use by policy makers and managers.
- There is limited availability of topographic data (near shore bathymetry and coastal topography) for the region. However, SOPAC is currently working to develop digital elevation models that can demonstrate the impacts of wave areas to inform planning of coastal development infrastructure.
- More detailed information on feedback loops and complex relations in the marine environment, alongside specific information on the timelines of climate change impacts, especially inundation and sea level rise is needed for accurate modelling. However, the use of proxies and expert judgement can support analyses limited by available data.
- Linking current science with policy is important to encourage political consideration of the likely implications of climate change. For example, the movement of commercial fish species in response to climate change influences could mean that in the future fish move out of individual Pacific Island Country territories, benefiting distant water nations. An analysis of projected catch on an EEZ basis now and 50 years into the future, as being undertaken by the University of East Anglia, would be a valuable exercise for the Pacific to identify and raise the profile of areas that stand to be most dramatically affected.
- In this vein Pacific Island Countries might also explore options for how they can be compensated from those who might benefit in the future, for the effective management of commercial fisheries within their territories at present in terms of Payment for Ecosystem

Services (PES). Conservation International is interested to explore these ideas. These arguments were likened to the terrestrial REDD arrangements, and the group encouraged to factor in these considerations to any initiative emerging as a result of discussions.

- Modelling of this nature for the Pacific is theoretically possible, although it will require more regional scale information and improved identification of the oceanographic and ecological processes that are important in the Pacific so that they can be used to tailor the global model.
- Deconstructing the homologue approach and the political and socio-economic frameworks which this tool was developed to support adaptation in the terrestrial sphere, there are a number of parallels which can be drawn with the marine and coastal context:
    - Homologue is a tool to orient people to their future conditions;
    - It is a mechanism that supports the exchange of practices and approaches between different areas;
    - It demonstrates the importance of using climate change information and projections to create demand and impetus for conservation;
    - It is connected to processes to develop value chains and markets, and link communities to service providers to support livelihood diversification;
    - Generates national interest and participation and responsive policy through innovative scenarios;
    - Local benefits driving conservation.
- The 'homologue' style approach was thought to have potential application to aquaculture industries or species to highlight tipping points to policy makers and managers.

SESSION 4 – Working Groups

The various challenges raised during workshop discussions were reviewed and clustered into a number of broad themes and priorities shared across this multi-sector group. These themes, alongside justification for their selection, were presented back as a basis for further discussion in working groups as summarised below:

- *Awareness*
    - Many of the issues discussed relate to the need for greater awareness, specifically, the idea that adaptive capacity is influenced by differing outlooks and perspectives. People's perceptions of risk was identified as an important predictor of resilience, and it was mentioned by a number of participants that there is a need to promote better understanding of what is and isn't influenced by climate change.
    - Our perspectives and expectations of management may need to be updated to move beyond the preservation of 'state' of the environment and this might include a reconsideration of the success criteria that is used to monitor performance in light of the fact that we are managing a resource that will likely be in future decline.
    - 'Messaging' challenges – how do we present adaptation to make it less daunting for people? How do we get CC and adaptation issues prioritised through more appropriate messaging? How can we make interventions more effectively around tipping points in order to influence change and build impetus for change?
    - Consultation fatigue is a key consideration in how we might implement future awareness activities; alongside the need to ensure that science is effectively translated for our audiences.
    - Other interventions underlined the fact that the marine environment is not given the profile it should have in the climate and adaptation debate and that especially in the

Pacific, coral reefs represent that obvious no regrets starting point and should brought to the fore.

- *Governance*:

    - How to build impetus for community based adaptation?
    - Recognising the poor flow of information between governments and communities, how do we build greater understanding of the trade-offs between different policies and actions and the knock on effects of these for livelihoods and ecosystems?
    - Mismatching of visions and needs with responses and shortfalls in existing approaches/'poor baselines'/and the replication of failures.
    - A consideration for governance is also how we might capitalise on the opportunities for climate change – while the emphasis of blame has shifted from governments to climate change, there may be opportunities to encourage some useful and responsive policies.
    - How to respond to sectoral adaptation gaps e.g. tourism?

- *Knowledge management:*

    - Many comments raised fit under this category: How to manage the process of rapid and continuous learning; avoiding duplication of effort; the notion of supporting cross learning and making learning available for others to connect initiatives and spread ideas?
    - There is a need for better integration of the issues – for the most part we have the tools, experiences and ideas and a mechanism to improve coordination of these might be helpful.

- *Capacity Building*:

    - There is a need to build the skills of resource users in the short term, before threats are imminent. You can provide the information but some people still will have no idea how to use this information and so we need to help people to use information to inform decision making processes.
    - Some capacity gaps were highlighted: How are we building and strengthening resource management and governance? How do we know when we have improved social adaptation and resilience?
    - Integration is essential, but managing multi-disciplinary teams is challenging.
    - Technical backstopping was highlighted as a need; should expertise be co-opted from other regions/internationally?

- *Spatial and/or temporal scales:*

    - How do we demonstrate benefits sufficiently to scale up activities and drive demand?
    - How can we focus on the short term benefits and immediate priority concerns for communities that may not be climate change related?
    - Linkages between community based initiatives and regional processes is needed to generate buy in and help to avoid mal-adaptation.
    - Activities must be framed within a broader development vision and strategy.

Participants split into 3 working groups to discuss tangible responses and possible solutions to the challenges and issues raised above from the *local, national* and *international* perspectives. Participants were asked:

- What kind of action(s) can help to respond to/address these challenges?
- What existing tools and approaches exist to respond to these challenges?
- How can the identified responses be supported by a technical partnership?

The results of the working groups were fed back to plenary. The following observations and recommendations were made:

Local working group

The 'Local' group began discussions with an assessment of current adaptation activities in the Pacific region, exploring options to support community level action in terms of *awareness raising* about the projected impacts of climate change and how to cope with the continuum of change – from shocks and disasters to less immediate and visual impacts such as physiological changes to the reef. Participants agreed that supporting rapid awareness raising through the media (including radio), theatre, climate change and reef resilience 'roadshows' is essential, and that linkages with schools, church groups, village leadership and government focal points are vital to ensure that information provided is acted upon.

In terms of c*apacity development*, the group discussed the importance of participatory and integrated approaches to enhance reef management and climate change adaptation. Technical inputs to provide communities with the most accurate scientific information in ways that can achieve results, and improved links with key service providers (including the local authorities, national government agencies, NGOs, microfinance institutions, etc.) were highlighted. Knowledge networking was also considered important – to allow communities to learn from the experiences of others and to interact with people and institutions that can advance understanding of the factors affecting the resilience of local marine and coastal ecosystems and support implementation of community adaptation strategies. Finally, the need to develop the capacity of communities to 'vision' and identify ways forward in the face of climate change (from the ecological, social, economic/livelihood perspectives) was noted.

The group discussed issues of *scale* in terms of replication of success, the use of demonstrations and learning from established management approaches (such as community based fisheries management).

In discussing *governance*, the group highlighted the importance of the role of the village leaders (including traditional structures, mayors, etc.) and provincial government/local authorities as change agents and enforcers. The group also discussed the need for recognition of community efforts to conserve and sustainably use coral reefs and related ecosystems by national government and mentioned the role of the 'gatekeeper' – someone in a central position able to communicate community needs and priorities to decision makers, and equally inform communities about the direction of government policies and plans. Finally, the issue of leadership and institutional strengthening was raised.

It was in discussing *knowledge management* that the group made a series of concrete recommendations for improving community-based adaptation and ecosystem based management of reefs. The recommendations are as follows:

- Communities need to understand better which impacts result from climate change and which are non-climatic impacts. Communications tools – as simple as a one page information document distributed through village leadership – would help.

- Local communities would benefit from the development of 'scenarios' and projections of climate change (linked closely to local/community visioning and planning processes) to support community visioning processes in support of adaptation.
- There is a need for 'local science' – support from the science and research community to substantiate and confirm that changes recognised by communities as impacts of climate change are valid; and to help communities themselves implement ecosystem based management strategies and plans that will protect the vital goods and services they rely on into the future.
- It is critical to better document the experiences, good practices and lessons of communities to support knowledge exchange between communities and to inform decision making. The group emphasised the importance of documenting traditional knowledge and practices for coping.
- The group also mentioned the overarching need for strong 'indicators of success' in terms of community adaptation and reef resilience through better and more systematic monitoring and evaluation.
- Finally, the group recommends the establishment of a '*Community* community of practice' to provide communities with essential knowledge around adaptation and resilience relating to coral reefs and related ecosystems and space for dialogue around 'tipping points' and core issues with a range of experts, practitioners and peers.

National working group

It was considered that climate change inputs should be designed to augment the ongoing efforts for coastal zone management and livelihood development. Any programmes should be based around clearly articulated demands and be flexible enough to deal with the wide diversity of contexts across the Pacific nations. As such, the national working group elaborated a vision for responding to the challenges: *to support national efforts to integrate CC (threats and opportunities) and ICM based on a foundation of supporting local management*.

Recommending a programme focused around three areas:

Awareness of climate change impacts and the opportunities and threats from international efforts to tackle climate change

- Support to governments to contextualise climate change in matrix of other threats through the development of communication strategies and avoiding the overemphasis on climate change (i.e. support informed decision making).
- Support governments to understand best-practice approaches to climate change adaptation.

Knowledge management

- Helping governments to collect and share information about climate change
- Helping governments to articulate changes and pressures to international fora, including damage and loss; compensatory measures.

Governance

- Developing the tools and providing support for understanding governance structures through institutional mapping, understanding information needs, strategic planning skills.
- Shaping climate change adaptation programmes to suit the different governance structures.

- Supporting enforcement; set legal basis for Community-based Management and Adaptation.

International working group

The international working group focused predominantly on issues of *awareness* and *knowledge management,* tackling the challenge of consistent messaging and the need to prevent disconnects in language used across sectors. The European Project on Ocean Acidification (EPOCA) was suggested as one example where significant inroads to raise understanding and awareness of a relatively new concept, ocean acidification, have been among decision makers, through the simple translation of scientific knowledge, responding to an obvious need for this information.

In this vein, a tool box of common messages was suggested, which could be accessed and adapted by individual organisations for their own specific context was suggested. It was noted by this group that a communications strategy would be required to support this process, which identifies key audiences for the effective communication of messages. A joint learning mechanism which captures tools and approaches already available, and can make these easily available, including facilitating the matching of these tools with specific stakeholder needs, was suggested as highly valuable.

Considering how to better integrate ongoing activities and information from adaptation projects conducted by multi-disciplinary projects, the provision of targeted networking opportunities to link these various groups was suggested, including bringing together the expertise and experience from each of these sectors into a demonstration activity or project to build synergies and create opportunities for exchange and interaction. These interactions would seek to link practitioners with technical specialists from community to government levels across sectors and with civic leaders. It is important to ensure that this type of exercise builds capacity rather than placing additional burden on over-stretched capacity within the region.

The IUCN Climate Change and Coral Reefs Working Group was recognised as trying to decipher and repackage new knowledge in this field, alongside the WWF/IUCN Ecosystems and Livelihoods Adaptation Network who are facilitating assessments and the development of baseline information for prioritising adaptation needs with societies globally. The role of ICRAN in facilitating peer-to-peer exchanges among managers for the uptake of best practices was highlighted. An initiative along these lines would need to strengthen existing initiatives and support their implementation and connection.

In the specific context of coastal communities and adaptation, it was suggested that a trusted source of guidance is required for all sectors, facilitating communication and cooperation and ensuring that messages are taken into existing initiatives through paper products and technical expertise. Specific materials that may be required were discussed including a series of handbooks that are designed to raise awareness of adaptation, and bring together the science, development and other perspectives, and to highlight the most important influences.

In terms of developing this idea, the working group suggested the following recommendations for follow up:

Short term outcomes

- Organizational concept – framing document that can be used to build support from donors and institutions, outlining the mechanism and communications strategy.

Medium term outcomes

- Resource kit (and beginning of a community of practice to build ownership in the guidance being produced) for adaptation.
- Program for funding and application through integrated demonstration initiatives (e.g. support to ongoing initiatives).

Long term outcomes

- Build a presence, programme (use same source material for 4 levels of products "awareness"
- Profiling and exchanging success stories of adaptation in reef dependent communities
- Improved mainstreaming of social science and interdisciplinary science into marine management.
- Empowered communities to cope with different climate scenarios.
- National regulatory frameworks sufficiency/gaps in addressing climate change.

Session 5 – Conclusions and recommendations

The workshop expressed:

1. A clear articulation of shared challenges from participants, representing a range of disciplines, geographic spread and institutional affiliation, relating to reef-based adaptation to climate change.
2. Similarities in the suggestions of how we might respond to these challenges in terms of approach and process.
3. Endorsement of the objectives and broad thrust of concept note prepared by ICRAN as a basis for future action.
4. Support for the creation of multidisciplinary working groups (described below) to further review gaps and needs, build on relationships developed during the course of the workshop, and explore how to advance activities that strengthen and connect existing coral reef management and adaptation activities.

Next Steps:

- **We would like to encourage parties interested in participating in particular working group discussions to confirm with nbarnard@icran.org or pstock@icran.org before 08 March 2010;**
- **We will write to interested parties after this date to initiate dialogue relating to each of the working group issues, with a view to maintaining the momentum generated during the workshop and advancing appropriate collaborations to match needs with opportunities, through joint fundraising;**

Working Group 1:

- The development of an applied programme/partnership to support coral reef adaptation that could potentially:
    - Strengthen the existing LMMA networks and support mainstreaming into an integrated multi-country management framework;
    - Harmonise countries and regions to multiple marine and coastal ecosystem management objectives via partnerships and collaborations;
    - Demonstrate and 'test' ecosystem-based adaptation strategies in the coral reef environment.

- Promote integrated management and governance to manage and restore marine and coastal habitats and their ecosystem services;
- Build the adaptive capacity of reef dependent communities;
- Better articulate and understand the economic and social costs (direct and opportunity) relating to loss of coral reefs and related ecosystems.
- Enhance the understanding of the status, trends and key drivers impacting marine and coastal ecosystems and the services they provide for human well-being and poverty alleviation as a basis for informed and coherent policy making and governance.
- Encourage communities and countries to take up best practices, relevant innovative technologies and production systems that reduce or eliminate the detrimental impacts of human activities on fragile marine and coastal ecosystems.
- Other ...

Working group lead members: Sameer Karki (UNDP), Hugh Govan (FSPI), Gabor Vereczi (UNDP), Nicola Barnard and Penny Stock (ICRAN), Ben Cattermoul (IMM Ltd), others.

Working Group 2:

- Tool Box on Adaptation and Coral Reefs to:
  - Raise awareness of adaptation in coral reef dependent communities and bring together current science, development and other perspectives in a series of handbooks or trusted guidance materials.

Working group lead members: Paul Marshall (GBRMPA), Ramon de Leon (Bonaire National Marine Park), Stuart Campbell (WCS), Hugh Govan (FSPI), Ben Cattermoul, other?

Working Group 3:

- An informal global resource network or Community of Practice (COP) on adaptation and coral reefs that could potentially:
  - Share essential knowledge around adaptation and resilience relating to coral reefs, related ecosystems and dependent communities, linking to a series of specialist reference groups to match needs and resources/tools with: a specific issue or subject (e.g. science, EBM, resilience); a cross-cutting theme (e.g. gender, livelihoods, capacity development); or target their dialogue to meet the needs of a specific group (e.g. managers, development practitioners, government, communities, private sector, other).
  - Work collaboratively to review research evidence, highlight new advances, support the translation of relevant science and research into action on the ground.
  - Proactive matching of resources with needs.
  - Facilitate peer learning, experience sharing and informed decision making between disciplines and across a broad range of stakeholders.
  - Develop a joint strategy and encourage multidisciplinary action around adaptation linking ongoing activities.
  - Put climate change agenda into correct context for ongoing initiatives (e.g. Micronesia Challenge). Building capacity to understand and respond to existing adaptation frameworks and strategies.
  - Other...

Working group lead members: Janna Shackeroff (NOAA), IMM Ltd, ICRAN, UNDP, others?

Working Group 4:

- Exploring the inclusion of climate change scenarios and reef resilience science into community programmes in the Pacific region to inform management and future visioning processes in the local CBM context. Details to be discussed.

  Working group lead members: Etika Rupeni, Kevin Petrini (GEF SGP CBA), UNDP, ICRAN, other?

Thank you!
Nicola and Penny

ANNEXES

1. Workshop Agenda
2. List of Participants
3. Original Concept Note – “Coral Reefs and Communities: Managing for Resilience”

Annex 1: Final Workshop Agenda

Day ONE – 26th January 2010

Part One – Introduction

9.30 – 10.15	**Communities and Coral Reefs: Managing for Resilience** Introduction into the proposed wider initiative to set the context of the workshop – *Nicola Barnard*, *International Coral Reef Action Network (ICRAN)*
10.15 – 10.20	**Objectives of the Meeting**
10.20 - 10.45	**Participant introductions and expectations**
10.45 -11.00	*Tea/ Coffee break*

Part Two – Situation Analysis

11.00 – 11.30	**Current Climate Change and adaptation projects in the Pacific region: a systematic approach?** *Espen Ronneberg, Climate Change Advisor, SPREP*
11.30 – 12.00	**Advances towards climate resilience in a national context: priorities and gaps.** *Gabor Vereczi, UNDP Samoa, RTA Climate Change and Adaptation*
12.00 – 1230	**Translating science and research into village action for adaptation to climate change: what do communities really need?** *Kevin Petrini (UNDP/GEF Small Grants Programme CBA Initiative) and Sholto Fanifau (UNDP/GEF Small Grants Programme Fiji)*
12.30 1300	**Discussion and questions**
13.00 – 14.00	*Lunch*

Part Three – Tools and Approaches

14.00 – 14.30	**Reducing vulnerability to climate change through local livelihood enhancement and diversification: strengthening ongoing activities** *Ben Cattermoul, Integrated Marine Management Ltd.*
14.30 – 15.00	**A framework for social adaptation to climate change: reducing fragmentation in adaptation responses** *Jerker Tamelander, IUCN Climate Change and Coral Reef working group*
15.00 – 15.30	*Tea / Coffee break*
15.30 – 16.00	**Resilience-based management of coral reefs and associated ecosystems: building science into management strategies** *Ramón de León, Manager, Bonaire National Marine Park*

1600 - 1730	**Participant Roundtable** Facilitated by Ben Cattermoul
1730	**Meeting Close**
1900	**Evening Reception hosted by SPREP**

Day TWO – 27th January 2010

9:00 – 9:30	**Review of Day One and progress towards our objectives** *ICRAN and SPREP*

Part Three continued–Tools and approaches

9:30 – 10:00	**Modelling climate change influences on productive sectors in tropical marine ecosystems: the value of scenarios for adaptation** *Dr. William Cheung, University of East Anglia*
10.15 – 11.00	**Application of the homologue approach in the terrestrial environment: guiding applied action** *Dr. Myles Fisher and Dr. Sam Fujisaka, International Centre for Tropical Agriculture (CIAT)*
11.00 – 11.15	**Discussion and questions**
11.15 – 11.30	*Tea / Coffee break*
11.30– 1300	**WORKING GROUPS – Addressing identified challenges and gaps from the local, national and international perspectives** Facilitated by Janna Shackeroff
1300 – 1400	*Lunch*
13.30 – 15.15	**PLENARY: Presentation and feedback from working groups with facilitated discussion**
15.15 – 15.30	*Tea / Coffee Break*

Part Four– Conclusions and recommendations

15.30 – 16.15	**Conclusions and Recommendations –** Facilitated by Penny Stock
16.15 – 17.00	**Next Steps and Action Points**
1700	**Wrap up and CLOSE**

Annex 2: List of Participants (in alphabetical order)

Name	Title	Institutional Affiliation	Email
Nicola Barnard	Acting Director	ICRAN	nbarnard@icran.org
Stuart Campbell	Regional Coordinator – South East Asia	Wildlife Conservation Society	s.campbell@wcsip.org scampbell@wcs.org
Ben Cattermoul	Social Development Specialist	Integrated Marine Management Ltd.	b.cattermoul-imm@exeter.ac.uk
William Cheung	Lecturer, Ecosystem Services	University of East Anglia, UK	william.cheung@uea.ac.uk
Sholto Fanifau for Katarina Atalifo	Representative for GEF SGP sub-regional coordinator for the SGP Fiji sub-region (Fiji, Nauru, Tuvalu, Kiribati, and Tonga)	UNDP / GEF SGP Fiji	Sholto.Fanifau@undp.org
Myles Fisher	Ecophysiologist; former Lead Scientist for Inter Working Group on Climate Change, CSIRO	CIAT	mylesjfisher@gmail.com
Hugh Govan	WCPA Marine Regional Coordinator, LMMA	Foundation of the People of the South Pacific (FSPI)	hgovan@gmail.com
Sameer Karki	RTA for Biodiversity, UNDP GEF	UNDP Regional Office: Bangkok	Sameer.karki@undp.org
Jeff Kinch	Coastal Management Advisor	SPREP	jeffreyk@sprep.org
Ramón de León	Manager	Bonaire National Marine Park	marinepark@stinapa.org
Nadine Marshall	Sustainable Ecosystems	Commonwealth Scientific and Research Organization (CSIRO)	nadine.marshall@csiro.au
Paul Marshall	Climate Change Group Director	Great Barrier Reef Marine Park Authority	paulma@gbrmpa.gov.au
Taito Nakalevu	PACC Coordinator	SPREP	taiton@sprep.org
Kevin Petrini	Focal Point	UNDP Special Priority on Adaptation (SPA) project on Community-Based Adaptation / GEF Small Grants Programme	kevin.petrini@undp.org
Espen Ronneberg	CC and Adaptation Advisor	SPREP	espenr@sprep.org
Etika Rupeni	Regional Coordinator Pacific Islands Roundtable for Nature Conservation	IUCN Oceania	etika.rupeni@fspi.org.fj
Janna Stackerforth	International Coral Reef Programme	NOAA	Janna.shackeroff@noaa.gov
Jan Steffen	Regional Science Advisor	UNESCO Samoa	j.steffen.unesco@gmail.com
Penny Stock	Biodiversity, livelihoods and capacity	WCMC/ICRAN	pstock@icran.org

	development advisor		
Sue Taei	Pacific, Marine Director	Conservation International	s.taei@conservation.org
Jerker Tamelander	Marine Coordinator / Coral Reefs and Climate Change Working Group	IUCN	jerker.tamelander@iucn.org
Gabor Vereczi	CC and Adaptation Advisor	UNDP Samoa	gabor.vereczi@undp.org
Supin Wongbusarakum	SEM-Pasifika	EastWest Center in Honolulu and University of Hawaii.	wongbuss@eastwestcenter.org
Joyce Samuelu	Principle Fisheries Officer	Ministry of Agriculture and Fisheries, Samoa	Joyce.samuelu@fisheries.gov.ws
Schannelle van Dijken	Programme Officer	Conservation International	s.vandijken@conservation.org

Apologies:

Sala Tagiilima	UNDP / GEF SGP National Coordinator for Samoa	UNDP/ GEF SGP Samoa	sala.tagiilima@undp.org
Colleen Corrigan	Senior Programme Officer, Protected Areas	UNEP WCMC	colleen.corrigan@unep-wcmc.org

UNEP WCMC

United Nations Environment Programme
World Conservation Monitoring Centre

Communities and Coral Reefs: Managing for Resilience in the face of Climate Change

Climate change variability has emerged as a significant, over arching and very real threat to tropical marine ecosystems globally. Its potential to cause extensive mortality to coral reef ecosystems and impact the communities who depend on them for a range of vital services (including food and income) is now little disputed. While this global phenomenon is largely beyond the control of local marine and coastal resource managers, meaningful action can be taken to respond to inevitable local impacts. There exists a critical need to align current science, development and institutional processes for the immediate implementation of local management strategies that strengthen the adaptive capacities and reduce the vulnerability of ecosystems and communities that are increasingly stressed by climate change.[2]

Background

More than 450 million people live within 60 kilometres of coral reefs, with the majority directly or indirectly deriving food and income from them.[3] Most, particularly the poor, rely on coral reefs and associated ecosystems for part if not all of their livelihoods, and are critically affected by the degradation of these ecosystems as a result of climate change. The adverse impacts of climate change on tropical marine ecosystems are multiple. They include mass coral bleaching and mortality through warming seas, acidification, increased intensity of tropical storms, coastal erosion, rapid sea level rise, and impacts on other organisms and ecosystems such as mangroves, seagrass beds, sea turtles and seabirds. These impacts combine with localised non-climate stresses (such as unsustainable and destructive fishing practices, pollution, and other anthropogenic impacts) to threaten the sustainability and very existence of these important ecosystems and dependent communities.

Preparing for climate change will thus be difficult. Unassisted, many coastal communities and reef-based industries will struggle to cope; vulnerable people will need guidance and support to anticipate the impacts of climate change and implement appropriate adaptation strategies if they are to sustain their livelihoods and quality of life in the future. Developing strategies and building capacities to manage social and institutional change will be as important as preparations for resource degradation.[4]

[2] As recommended by participants of the 3rd International Tropical Marine Ecosystem Management Symposium (2006) and Resolution 4080 adopted at the 4th IUCN World Conservation Congress (2008) which calls specifically for the "mobilization of action to build resilience and assist adaptation to climate change of coral reefs and marine ecosystems and people that depend on them."

[3] Clive R. Wilkinson, 1996. Global Change and Coral Reefs: Impacts on reefs, economies and cultures, Global Change Biology.

[4] N.A. Marshall, P.A. Marshall, J. Tamelander, D. Obura, D. Malleret King and J.E. Cinner / IUCN Working Group on Coral Reefs and Climate Change. Sustaining Tropical Coastal Communities and Industries: A Framework for Social Adaptation to Climate Change. *In draft; November 2009*.

Need

As international leaders and decision makers negotiate the reduction of greenhouse gas emissions to control the rate and severity of future climate change, marine and coastal resource managers must take meaningful action at the local level to adapt and respond to inevitable climate change impacts, already experienced by many communities and ecosystems across the globe. Managing for socio-ecological resilience recognises the opportunities provided by effectively managed coral reefs in supporting the environment and dependent human communities to absorb shocks, regenerate and reorganise so as to maintain key functions, economic prosperity, social wellbeing and political stability. Building the ability of reef users to anticipate and plan for climate-related changes while 'buying time' for ecological recovery through effective local reef management creates powerful and cost effective opportunities for valuable action to cope with shocks and variability.

In terrestrial ecosystems, the Homologue approach[5] has facilitated the identification and analysis of similar environmental niches around the world for the exchange of relevant and effective practices between land stewards. The application of climate change models to particular locations has enabled communities to learn from and visit sites that might best represent their environment in the future, and in the face of climate change. Such projections, adapted for the marine environment (i.e. through the development of a 'marine homologue approach' for tropical coastal areas using coral reef dependent island communities as a model system), could help coastal communities to prepare for likely changes. Critically, the approach will move beyond a comparison of ecosystems and management practices towards more comprehensive data[6] that includes both ecosystems and socioeconomic variables, and which recognizes linkages between ecological and socioeconomic vulnerability and adaptation. It will raise awareness of important options for responding to climate change in the local context, and guide the development of responsive and informed policy, management and livelihood strategies. The approach will help communities to build more systematic and process-based ways of responding to the shared challenges of climate change; it is this 'process' (rather than solutions) that will be exchanged between communities in order to ensure that the adaptation strategies and actions implemented are relevant to communities—grounded in their strengths and aspirations—while steeped in strategy and science.

The ability of managers and policy makers to develop policies and strategies that strengthen adaptive capacity will become increasingly important in light of rapid and radical exogenous changes which threaten the sustainability and existence of coral reefs (e.g. climate change, global recession, changing patterns of international demand). Greater communication, coordination and collaboration is required between stakeholders if operational responses are to be effective. The project will seek to understand and respond effectively to the political economy determining coral reef management, conservation and use, and use this understanding to guide efforts to strengthen the capacity of countries and communities as they respond to the challenges of climate change through the effective management of tropical marine ecosystems. The project will ensure that local experiences and approaches are integrated into national and international development processes.

The innovative work of the Coral Reef and Livelihoods Initiative (CORALI)[7] alongside ongoing global efforts[8] will guide the actions of vulnerable coastal communities to identify their needs and

[5] The Homologue concept was pioneered by by the International Centre for Tropical Agriculture (CIAT), part of the CGIAR group. http://www.ciat.cgiar.org/

[6] The approach will not seek as a priority to increase the accuracy and precision of the next generation of climate models; rather it will depend on a greater understanding of the vulnerability of climate-influenced decisions to large irreducible uncertainties and the improved management of existing global and local climate data to inform adaptation planning and support action.

[7] CORALI is a collaborative partnership between IUCN, IMM, CORDIO, ICRAN, and local organisations in South Asia, through funding from the European Union and Ministry of Foreign Affairs, Finland.

opportunities for sustainable livelihoods in the face of climate change (including how to benefit sustainably from favourable changes); facilitate linkages to key national service providers and across sectors and disciplines; raise awareness of the inherent linkages between ecological and social resilience; and realise the potential of local management action to provide opportunities for meaningful local and global benefits. Action will support global development and conservation targets enshrined in the MDGs to reduce poverty, improve food security, promote inclusion and provide a platform for the 'voices and choices' of the poor.

Aims and objectives

The aim of this initiative is to strengthen the capacities of vulnerable coastal communities to respond to the challenges of climate change through the effective management of tropical marine ecosystems.

The initiative has 4 core objectives:

1. To develop the capacities of national and local stakeholders to predict and cope with climate change and other exogenous factors.
2. To inform and influence responsive policy, legislative and institutional frameworks to support socio-ecological adaptation to climate change.
3. To promote sustainable livelihoods consistent with sustainable use and conservation objectives.
4. To translate cutting edge science and research into village actions for climate adaptation.

Results/Outcomes

Objective 1: To develop the capacities of national and local stakeholders to predict and cope with climate change and other exogenous factors.

1.1 Resilient national and local systems for managing the impacts of climate change on coral reefs and dependent communities.

1.2 Informed coastal community institutions engaged with national service providers and international scientists and researchers in support of adaptation at the local level.

1.3 Community-to-community exchanges, based on the homologue concept, lead to adaptive capacity, holistic reef management approaches and livelihood strategies.

1.4 Improved national institutional capacity to predict and analyze the potential impacts of climate change on coral reef ecosystems and communication of findings to dependent communities.

1.5 Information systems established based on GIS, data collection and expert and local knowledge monitor the impacts of climate change on the local marine environment and contribute to the identification of opportunities for future livelihood enhancement and diversification.

1.6 Improved interdisciplinary/cross-sectoral participation, based on the SLED approach, in strategic planning processes for adaptation to climate and exogenous change.

Objective 2: To inform and influence responsive policy, legislative and institutional frameworks to support socio-ecological adaptation to climate change.

2.1 Assessment of specific political economies and existing capacities at project sites and at the national level to guide implementation and successfully engage stakeholders.

[8] For example: Many Strong Voices: Action on Climate Change; IUCN Climate Change and Coral Reefs Working Group; CRiSTAL adaptation tool and others.

2.2 Mobilisation of institutional champions for the replication of effective community action.
2.3 Integration of climate change impacts on the marine environment and dependent communities into core institutional thinking, poverty reduction practices and development/conservation policy and strategy frameworks.
2.4 Integration of climate forecasts into risk mitigation and early warning strategies for coastal communities, coastal zone planning, and other decision making relevant to coastal populations.
2.5 Recognition by policy and legislative frameworks of the role of well managed coral reef ecosystems in providing opportunities for social adaptation to change in vulnerable communities and replication of effective action.

Objective 3: To promote sustainable livelihoods consistent with sustainable use and conservation objectives.

3.1 Exploration by coral reef dependent communities, through the Sustainable Livelihoods Enhancement and Diversification (SLED) action research process, of their resource dependency; visions voiced for local livelihood adaptation in light of climate change.
3.2 Rural enterprises and products linked to modern markets and value chains established in support of alternative livelihoods to enable generation of buffer income in face of climate variability and shocks.
3.3 Catalytic small grants disbursed in support of livelihood adaptation activities.
3.4 Existing microfinance schemes support longer-term livelihood adaptation activities and efforts to scale up existing businesses.
3.5 Gender specific support to 'at risk' coastal women to enhance their adaptive capacity and reduce their vulnerability to climate change impacts.

Objective 4: To translate cutting edge science and research into village actions for climate adaptation.

4.1 Homologue models and scenarios generate knowledge of coral reef acclimation and adaptation needs in the face of global climate change.
4.2 Implementation of meaningful management strategies that reduce local stressors on reefs, increase coral reef resilience potential and maintain healthy ecosystem goods and services.
4.3 Informed communities integrate traditional and scientific knowledge into implementation of adaptation strategies for coral reefs in selected sites.
4.4 Learning and knowledge network established for the transfer of information between villages and wider development/conservation community.
4.5 Dependent communities engaged in education, awareness and participatory management actions that reinforce the conservation and sustainable use of coral reef ecosystems.

Budget and timetable
To be confirmed.

Partners

- ICRAN: An innovative and dynamic network of many of the world's leading coral reef science and conservation organisations. The network consolidates technical and scientific expertise in reef monitoring and management to create strategically linked actions across local, national and global scales. ICRAN, hosted by UNEP-WCMC, will serve as project manager.
- UNDP: This collaboration will ensure that interventions are contextualised in broader country poverty reduction, development and conservation strategies, policies and plans. It

will provide opportunities to link with national adaptation processes. It will help to scale up successes nationally and regionally; and provide access to complementary projects and programmes.

- IUCN Climate Change and Coral Reefs Working Group: This group brings together leading coral reef scientists and managers to develop management tools that enhance the resilience of coral reefs and coral reef-dependent communities in the face of climate change. The group will provide critical strategic advice and guidance on issues relating to project implementation, with particular emphasis on implementation of the Homologue approach and CRiSTAL adaptation tool.
- IMM Ltd.: Provides high quality services and support through partnerships with communities, governments and other development organisations to achieve equitable and sustainable development. IMM would support the implementation of the SLED process.
- Others including IIED, CI, TNC and leading research institutions.
- Donor partners.

Date: 11/11/09