Regional Expert Roundtable on Climate Services for Agriculture and Food and Nutrition Security

Apia, Samoa
23 – 24 February 2015

REPORT

Contents

Acronyms

CAgM	WMO Commission on Agro-Meteorology
CC	Climate Change
DARD	Department of Agriculture and Research and Development
ENSO	El Nino Southern Oscillation
FAO	Food and Agriculture Organization
FSPF	Food Secure Pacific Framework
GFCS	Global Framework on Climate Services
MAF	Ministry of Agriculture and Fisheries (Samoa)
MAFFF	Ministry of Agriculture, Food, Forests and Fisheries
NIWA	National Institute of Water and Atmospheric Research
NMS	National Meteorological Service
PACC	Pacific Adaptation to Climate Change project
PICS Panel	Pacific Islands Climate Services Panel
PI-GOOS	Pacific Islands Global Ocean Observing System
PMC	Pacific Meteorological Council
SIDS	Small Islands Developing States
SMD	Samoa Meteorological Division
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
SWOT	Strength Weaknesses Opportunities and Threats analysis
TMS	Tonga Meteorological Service
USAID	United States Agency for International Development
USP	University of the South Pacific
VMGD	Vanuatu Meteorology and Geo-hazard Department
WMO	World Meteorological Organization

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Opening Session: Introductions and scene setting for the Roundtable

The meeting was opened by the deputy director general of SPREP, Mr. Kosi Latu and the FAO subregional coordinator for the Pacific, Mr. Gavin Wall. In their remarks, both touched upon the critical challenge posed by climate change to the Pacific nations; the impact on agriculture and thus food security; and the need to work in partnership to ensure that strong national meteorological services provide climate information that is actioned by the agriculture sector, at all levels.

Mr. Viliamu Iese of USP gave a scene-setting keynote address to remind participants of the core questions to be addressed by the roundtable. In summary, he presented the main areas of concern in the area of climate services for agriculture as:

-The need for timely access to information
-Access to the right information
-The use/application of this information at all levels

He pointed out that the over-arching and eternal question facing both meteorologists and agriculturalists is 'What if?' and that the focus must be on how to answer this question in an actionable manner.

Session 2: Perspectives on the needs for climate information for agriculture

The intention of this session was to 'set the scene' from the agricultural user perspective.

Panelists were asked to address three key questions in their remarks:

1. What are current gaps that influence access and understanding of climate and weather information?
2. What are the challenges to the partnership, citing lessons learned and experiences gained from completed or ongoing projects/programmes?
3. What are climate/weather information needs and requirements for the agricultural 'end user'?

Panelists' remarks are summarized and categorized below:

Gaps

- Timely access to data due to protocols, lack of standardization
- Insufficient use of crop modelling
- Farm-level: Understanding of the combination of risk, hazard and vulnerability.
- Some weather stations not recording sunshine hours

- Effective assessment of needs at community level in terms of information to ensure what is provided is relevant
- Needs assessment of capacity of extension staff providing information must also be taken into account
- The development of effective 'language' that links scientific climate service and climate change data and information into messages that lead to a change in farming practices on the ground
- Introduction of risk indices in forecasting to create an early warning system
- Scarcity of met service stations for information on micro-climate for pests

Information needs

- Climate aspects that will affect plant nutrients
- Drought risk – available water capacity for plants and prediction of water stress
- Crop modelling at research-level: max/min temperature; sunshine hours/solar radiation; soil temperature; long-term projections and seasonal forecasts.
- Community-level: climate messages must reach the farmers in a way that are actionable for them (including mitigation/options recommendations)
- Communications: two-way mechanism must be in place so that met services can understand end user requirements
- Pest management: reliable forecasts are required for both macro climate (national outbreak) and micro climate (pockets of outbreak) in order to prepare for both scenarios. The micro climate scenario is a particular challenge because the weather information is not sufficiently detailed.
- From the agriculture side, there is often very limited data to link to the met data and thus conduct historical analysis or projections

Challenges to partnership

- Limited communication at national level (i.e. no established mechanism/protocol)
- National MAFs need to be more proactive in linking to Met Services; there is a need to ensure this linkage is incorporated in national plans/policies/corporate plans (e.g. ag sector plan). However, even if when included in a plan must consider if it is working and, if not, review and address.
- Increased dialogue at regional level is required between the various organizations
- Lack of data sharing protocols between Met Service and other entities

- Need to assess the linkages and mechanisms appropriate in a particular country to ensure that both agricultural technical personnel and communities are receiving and acting on information
- Lack of mechanisms, working groups, platforms that support partnership

Participant reactions and main points are summarized below:

- Traditional practices/knowledge of weather and climate used to be passed down, but this is declining. This is impacting resilience of populations. However, with climate change, some traditional knowledge is sometimes 'mismatched' to the situation.
- The lack of a culture of disaster preparedness exacerbates the lack of demand for weather/climate data to better inform projections affecting food security
- The need for two-communication was strongly endorsed by participants – forecasts are issued, but in the absence of feedback, it is very difficult to refine information products or produce alternative tools
- The view was expressed that met services are producing increasingly reliable data, but that ministries of agriculture are not making use of this data – there is a strong need for capacity building of agricultural research and extension officers in this area.
- Crop models should be a priority and this will help ministries/agriculturalists to better identify their data requirements.
- Data storage is a major issue and needs to be addressed

Session 3: Pacific Island Climate Services for agriculture: perspectives from national met services on successes and gaps

The intention of this session was to 'set the scene' from the meteorological services' perspective.

Panelists were invited to provide their perspectives and experiences in this area.

Main points are summarized below:

- Vanuatu has a well-developed platform and formal engagement between the met services and the department of agriculture. This has resulted in a number of achievements:
    - Three national agro-met summits
    - A memorandum of Agreement between VMGD and DARD

    - DARD provision of climate forecasts, simplified to be understandable to farmers – disseminated via extension officers
    - ENSO/early warning system has been established, via the Food Security and Agriculture Cluster.
    - Production of ENSO handbook (for agriculture); provides information on practices for drought, flooding (pre, during, after)
    - Ongoing collection/documentation of local knowledge weather indicators and on crop calendars
    - Production of agro-met bulletins: met services provide seasonal forecasts and DARD produces the agro-met bulletin; disseminated through the church and 'chiefs' network
    - Development of a Communication, Partnership and Engagement Strategy
    - Provision of information to farmers through community-based climate field schools (3 to date)
    - Review of agricultural extension materials to reflect climate change information
    - Work with met department on two project sites to measure
- Nevertheless, challenge remains of getting people to use new information/data versus traditional knowledge.
- Linkage between met and ag can be a challenge exacerbated by limited personnel in the met services of certain countries.
- The lack of feedback received by met services from end users is a significant issue.
- Crop modelling is an important exercise in the linkage between the two.
- Met services can strengthen and expand their own communication capacity in order to ensure that qualified climatologists engage with various stakeholders.
- When resources are limited, and extension services do not have sufficient reach, need to identify alternative mechanisms to reach communities (churches, chiefs, NGO's, projects)
- A met services communication strategy will help identify target audiences (e.g. MAF technical officers versus small-scale farmer).
- Networks and contacts can help overcome some of the 'protocol' issues but formal MoUs and agreements are still required.
- It must be recalled that met services have different levels of capacity across the region and one must therefore set realistic expectations of the burden that can be placed on the met services.
- At regional level there is a need for the climate information that is currently circulated to be supplemented with sector-specific inputs as an overlay (e.g. for water (such as the NIWA-produced 'Water Watch'), agriculture, etc.

Participants reacted with the following key points:

- Suggestion of a technical/vocational course to be run by the met services for agricultural services to have the ability to interpret the forecast and then link forecast to action.
- The fragmentation between policy and actual implementation at country-level must be considered. There is often a missing link between regional strategies and national actions.
- Opportunities exist for NMS under the Global Framework for Climate Services (GFCS) to seek opportunities to further enhance climate services for agriculture sector and perhaps trial the exchanges between NMS and sectors in looking more closely at the areas of cooperation and exchange that are of benefit to an information end user.
- The responsibility lies with the agriculturalists to take the met/climate information to prepare/predict disasters/other events.
- Tonga example: will move issuing of climate bulletins to a collective effort (between MAFFF, farmer groups, met) – not just a scientific bulletin from the met service. A formal working group with a ToR has been established under the Agricultural Growth Committee, chaired by the Minister of Agriculture).

Session 4: Introduction to the Action Plan

Participants were asked to provide their views, in addition to the points from the preceding sessions, on key elements of such a plan.

The following points were put forward for consideration:

- The need to make global-level climate services available at the regional level and in turn to benefit at the national level, where there may be insufficient resources and capacities
- Cannot build a 'one size fits all' approach; in the development of a plan, must keep in mind all the elements that can contribute/synergies with other efforts and include a check-list of existing projects/actions/initiatives that can contribute or draw on this work.
- Any action plan must be aligned to national priorities.
- The action plan requires both a policy-level and on the ground entry points.
- A strong emphasis/focus on implementation must be retained
- Action plan must be based on existing platforms and frameworks.

Session 5: Introduction to climate services at Samoa Meteorology Division

Participants were welcomed at Samoa Meteorology Division by Mulipola Ausetalia Titimaea, Director of Samoa Meteorology Division. A variety of international project partnerships and regional development programmes in the Pacific region have helped to improve capability and technical capacity of Pacific Island Meteorological Services to deliver better services to national economic sectors and other user interests. Samoa Meteorology Division (SMD) has benefitted from projects such as those implemented under the country's National Adaptation Programme of Action, funded by the Global Environment Forum, and the Australia-Samoa Economic Partnership, and from the Australian Government's Climate and Oceans Support Programme, and its predecessor the Pacific Climate Change Science Programme.

Fata Sunny Seuseu, Manager of Climate Services at SMD, gave an overview of developments in climate services at the Division, and the increasing ability of SMD to offer climate services to the Health, Agriculture and Forestry sectors in Samoa. This lead to questions and discussion about how to better incorporate agricultural knowledge with climate services, particularly the use of soil science data and expertise, and improvements to soil water balance modelling. It was recognized that agricultural managers find it difficult to interpret climate outlooks in day-to-day crop management.

Participants then saw a demonstration of CliDE (Climate Data for the Environment), a climate data management system developed by the Bureau of Meteorology of Australia, and installed in 15 Pacific Island countries. The Fire Warning Index, drought index, and an example taro crop model were demonstrated using the CliDEsc applications software developed by NIWA in consultation with a number of Pacific NMS.

Session 6: Crop management decision time-line: a work flow model

Participants worked in groups to collate data and information needed during the life cycle of a typical crop. This included the science and planning required in advance of the crop, interventions needed during the establishment, growth and harvest, and post-harvest management.

GROUP 1 focused on farmers' data needs:

1. Traditional knowledge data and terms into farmers' language
2. Traditional indicators
3. Impact data
4. Growth cycle for each crop.
5. Soil data, biological , physical, and chemical (soil, temp, moisture)
6. Weather data:
    a. Max, min, temp

b. Daily rainfall
c. Sunshine hrs/solar radiation; day-length
d. Relative humidity
e. Wind speed and evapotranspiration

7. Day-length – some photosensitive varieties were used by farmers (eg. rice, sweet potato)

GROUP 2 created a matrix of both inputs to and outputs from the work flow, as follows:

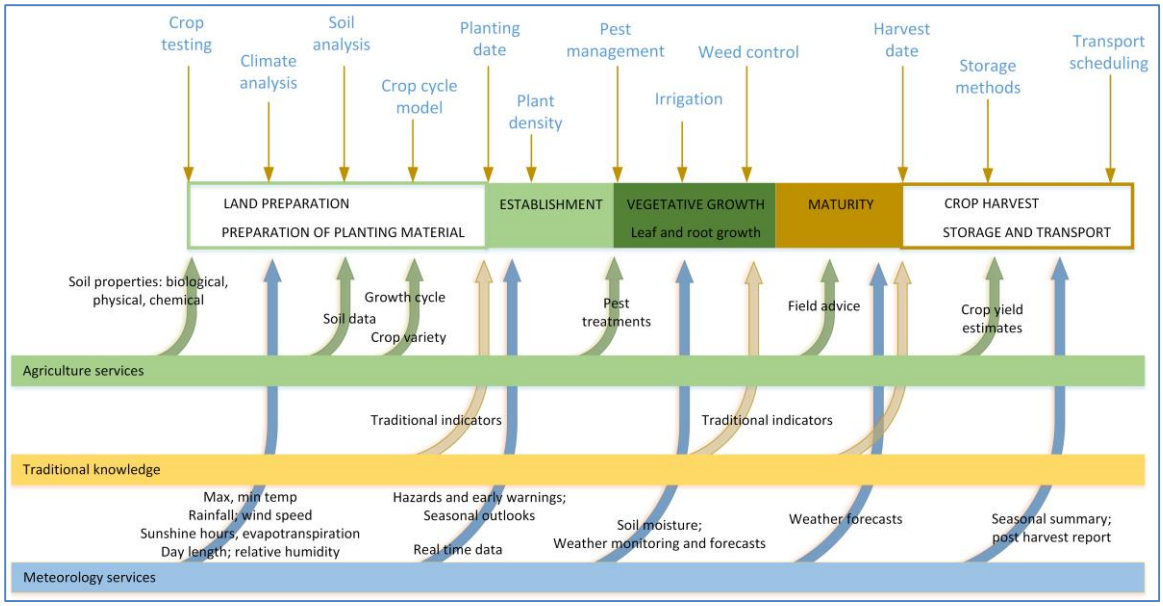
Inputs	Outputs
Preseason preparation Assemble met and ag data • Soil moisture • Seasonal forecast • Climate data • Traditional knowledge	Food crop variety selection Crop modelling Crop calendar
Planting and establishment • Traditional knowledge • Soil moisture • Monitoring of weather • Real time data • Forecast weather • Variety characteristics • Hazards (weather, pests and diseases)	Planting timing Actions • Pest management • Irrigation Sustainable farming system Crop modelling
Harvesting • Weather forecast • Market value ($) • Crop calendar → maturity stage • Crop modelling	Crop size and quality
Post harvest • Crop rotation • Soil fertility (tests) • Fallow • Verify climate modelling	Improve soil conditioning Improve soil fertility (pH, texture, etc)

GROUP 3 compiled the following check list:

1. 15 to 17 weeks is when taro grows fastest and is therefore the time when closest attention needs to be paid to field conditions including weather.

2. Heavy rainfall is an issue as crops approach harvest eg. water melon is damaged by too much rain near harvest.
3. Powdery mildew is significant problem in wetter than normal conditions
4. Need to ensure that farmers have good knowledge of
    a. Land
    b. Seedlings
    c. Capital
    d. Labour costs
    e. Traditional knowledge, such as phases of the moon
    f. Soil conditions, including sampling of structure and infiltration
    g. Ideal conditions for the crop during vegetative growth and the harvest period.
5. Forecast and advance warning needs:
    a. Rainfall
    b. Air and soil temperatures
    c. Cloudiness
    d. Conditions that might impact soil quality
6. Information needs for field planting and crop management:
    a. Relative humidity
    b. Evaporation
    c. Soil moisture measurements, eg using a tensiometer
    d. Feedback on pest incidence
    e. Heavy rainfall warnings

Some of this information is incorporated into the work flow model below. The model highlights multiple requirements for data inputs at each phase of a typical crop cycle. The Roundtable session highlighted the need for collaborative inputs from agriculture, traditional knowledge and meteorology.


Crop testing
Climate analysis
Soil analysis
Crop cycle model
Planting date
Plant density
Pest management
Irrigation
Weed control
Harvest date
Storage methods
Transport scheduling
LAND PREPARATION
PREPARATION OF PLANTING MATERIAL
ESTABLISHMENT
VEGETATIVE GROWTH
Leaf and root growth
MATURITY
CROP HARVEST
STORAGE AND TRANSPORT
Soil properties: biological, physical, chemical
Soil data
Growth cycle
Crop variety
Pest treatments
Field advice
Crop yield estimates
Agriculture services
Traditional indicators
Traditional indicators
Traditional knowledge
Max, min temp
Rainfall; wind speed
Sunshine hours, evapotranspiration
Day length; relative humidity
Hazards and early warnings;
Seasonal outlooks
Real time data
Soil moisture;
Weather monitoring and forecasts
Weather forecasts
Seasonal summary;
post harvest report
Meteorology services

A further decision support matrix was created during the Session, designed from the perspective of a farmer or crop manager who typically relies primarily on historical experience and traditional knowledge. This matrix highlights the need to provide climate services that enable improved decision making in conjunction with customary practices where these have a strong influence on decision making.

Crop stage	Decisions to be made	Traditional information	Climate influence on traditional indicators	Climate influence on decisions to be made	Climate info
Pre-planting	Crop selection and variety Land preparation				
Planting	Planting date and plant density				
Growth stage	Stress responses				
Harvest	Work days (ideal weather)				
Post harvest	Storage methods. Transport options. Marketing				

Session 7: Presentation of an Information Flow Model

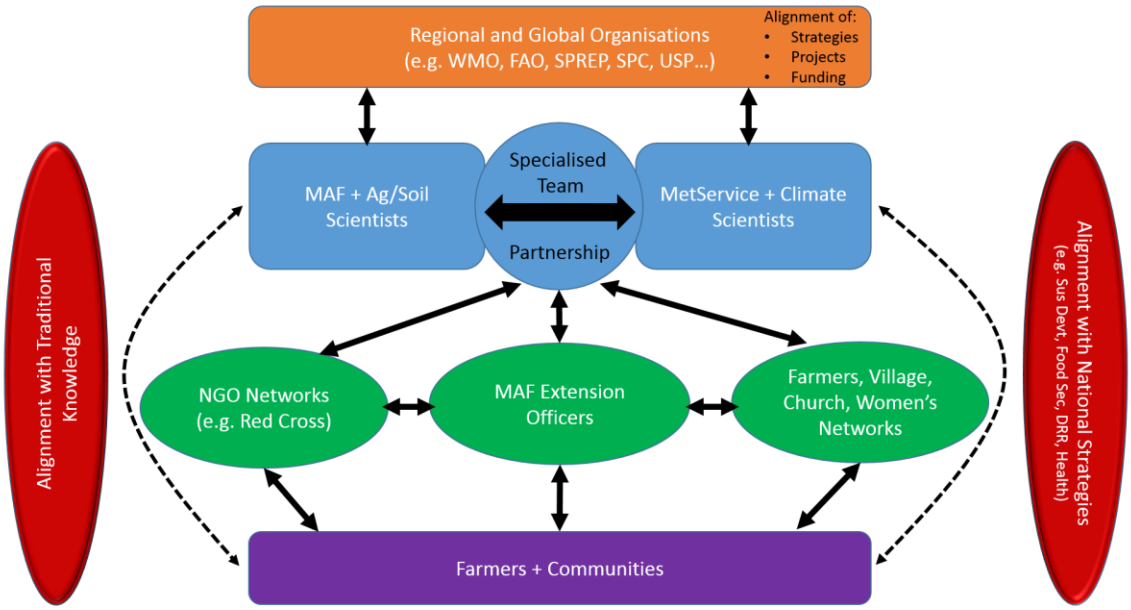
Based on the discussion from the previous sessions of the roundtable, and from similar conceptual models produced for other regions and purposes, an "Information Flow Model" was presented and discussed. The following diagram is a reproduction from the one drawn on the white board. Basically, the diagram shows the components and linkages needed for the interpretation/simplification and effective communication of complex information (e.g. a regional-scale seasonal climate forecast, with a specific focus on the probability for drought) to end users (e.g. farmers and rural communities).

The starting point of the flow of information is the key linkage between the National Meteorological Service and the relevant National Ministry (e.g. Agriculture & Forestry/Fisheries). It was agreed that this "partnership" must be established (or reinforced) and be comprised of a "specialized team" of experts from both organisations. Regular team meetings should be scheduled, and the source information (e.g. the seasonal outlook) needs to be fully discussed and understood by everyone.

From these meetings, simplified and tailored information should be produced, which is specific to the needs of the intended users. Ideally, such information should then be channeled through intermediary networks of trusted communicators (e.g. extension agents, churches, NGOs, etc.). To do this well, the information must be clear and concise (short statements; including pictures) with simple messaging around response actions, so that it can be understood both by the communicators and the end users.

The diagram also shows linkages to Regional and Global Organisations (an in particular to their respective strategies, projects and funding), as well as the need for alignment to National Strategies and Traditional Knowledge. The dashed lines indicate that in certain circumstances, information can and does flow directly from the "producers" to the end users, through mechanisms such as the community-based climate field schools where both the met and the sector key address issues at the community level, but this usually involves more technically adept users and well-established lines of communication.

Lastly, all the linkages are represented by double-headed arrows, indicating the importance of feedback on the use (and usefulness) of the information. Without this feedback there is limited scope for improving the content and format of the information.



Session 8: Summary

Overview of the Workshop

The workshop had heard from the agriculture and food security experts about the regional status of the Pacific with regards to agricultural production and food security, their declining rates across the region in contrast to the growing risks imposed upon the sector by climate change risks and other pressure issues. Whereas globally, approximately 40% of the world's population relies on agriculture as a direct source of livelihood, in the Pacific, the average is closer to 80% of the total Pacific population. Other measures such as shifting populations, globalization of food markets, increasing health risks in the Pacific to NCDs, and national land use policy, priority and tenure, are all factors contributing to an increasingly complex picture of interrelated risks to food security in the region. However, while some of these new exposures (climate and non-climate risks) threaten to overwhelm the food security concern of Pacific countries, there remains some core resilience still in their food security through the remaining practice of traditional knowledge systems as applied to traditional agroforestry and conservation practices. These inherent strengths is recognized as important for knowledge capture and further study to enhance future interventions that seek to bolster community level food security.

Adding to the concern of a struggling agriculture sector are climate change risks and climate variability impacts that spawn more frequent and more intense weather and climate related natural hazards and their extreme impacts. The climate projections developed for the Pacific by the Pacific Climate Change Science Program projects shifting rainfall regimes, rising sea levels, and increased maximum and average temperatures across the region over the current decade. Meanwhile the past decade has seen higher extreme day time temperatures, more frequent storms and tropical cyclones, as well as increasing impacts of heavy rainfall and drought, with flash floods, and forest fires and crop failures.

Fortunately the past decade has also seen a leap in the development of the capacity of national meteorological services to improve on their advance warning systems with regard to meteorological hazards and others (such as tsunami). Today, some Pacific national meteorological services have high technical capacity already serving agriculture related information such as rainfall maps matched to soil maps to develop crop suitability maps, and so forth. Aside from sophisticated historical database systems, NMS maintain observing networks that have near real time data visualization tools available for detailed monitoring of weather conditions out in the field. While some of these serve primarily weather forecasting and climate monitoring purposes, such stations and their data have potential for new products to help agriculture end users to

make decisions at that level of time scales. Under the Global Framework for Climate Services (GFCS), a pathway and supporting framework has been set out for meteorological services to reach out to sectoral counterparts to develop specific data and information services and products to help enhance their own services. As such a range of possible services (termed climate services) can now be utilized by the agriculture sector for their needs to add climate information value to their regular advisory services.

These overview remarks then in summary of the two days of the roundtable capture the concern and opportunity that, while agriculture services face challenges in future proofing the sector from weather and climate related risks and hazards, that climate services from national meteorological service counterparts can be used to enhance the advisory services delivered to agriculture related end users.

Outcomes of the Expert Roundtable

This expert roundtable is understood to be the first of its kind between the agriculture and meteorological services, and allowed a formal exchange of information between the two sets of experts and their fields of expertise. It was agreed that the setting had been an informal one that had contributed to the easy flow of information exchange, and open frank discussions as well. The common view here was agreed by all in general to be the view on improving services to agriculture end users through value adding agricultural advisory services with climate services. From the notes of the rapporteurs of the two days of discussions, a cloud of words from the meeting were used to produce a Word Cloud where common and oft repeated terms were highlighted from remarks of participants. Out of this Word Cloud, the most prominent words that resulted were; information, communication, partnership, research, databases, feedback, data access, data, community, and sharing. These are thought to be a reflection of the main thrust of the discussions and point to the earlier observation that both expert areas would and should get together and encourage these common ground actions to take place.

A closer look at the issues covered and discussed led to the observation that the issues could generally be split into those that would be classified as being at the national level, while others being more of a regional level concern, both as actionable items as well as the actors primarily responsible also.

At the **national level**, some of the key general actions encouraged were as follows:

i. A meeting of the agriculture and meteorological services – establishment of a relationship as a first actionable item is key to moving a relationship forward. Experiences had earlier been shared about how to affect a productive

partnership with ideas on the usefulness of MOUs and LOAs to underpin shared outputs and delivery of agreed upon services.

ii. A capturing and sharing of best practices - from lessons learnt and use of peer to peer training on institutional strengthening in areas underpinning the relationship such as information and data management, policy development, etc.

iii. Mainstreaming partnership into existing workspaces – or creating of new workspaces to identify this new area to assure supporting resources etc. e.g. entry of commitment to shared research in respective annual plans and follow up reports on progress as measures of achievement.

From the examples shared during the two days, it is evident that in some of these workspaces that the invited countries could set the tone and lead on many of these through already completed activities e.g. Tonga, Vanuatu, and Samoa working together to provide a manual with guiding principles and actions to establish an Agriculture-Meteorology formal engagement for information and data sharing, user engagement model to be deployed, shared communication plans, and research priorities etc.

At the **regional level**, the sponsoring partners of the roundtable found agreement that there are actions that would require regional support from respective agencies, as follows:

i. Resource mobilization, identification of new opportunities, leveraging existing regional activities – this being a 'new' area of work, that existing resources may not easily be identified for this workspace, that the agency partnership could bring to bear or raise resources for this purpose, identify new opportunities to introduce and assign to this work, and finding opportunities in existing programmes for benefit of this work.

ii. Terming of this piece in partner/donor programmes – highlighting of this new area of work to development partners to garner interest and opportunity to include in current or future programmes.

A discussion between partners led to the identification of existing programmes that could provide some early support based on a set of possible early successful outputs in this workspace. Examples of these are in engaging WMO in CAgM, RAV CS-Ag, GFCS, and SPC/SPREP/FAO under GFCS again, FSPF, SPREP under PICS Panel and PMC/PIMS. It was commented upon that while these find traction in the respective areas of meteorology and agriculture, that some effort must be put forward in proposing a set of possible

proposals that address the combined areas together to capture the spirit of making gains for this new work area.

In further discussion between the partners, an idea was developed that a proof of concept be developed around an activity or issue where a demonstration of the combination of agriculture and meteorological services could showcase the benefit of a combined value added product or service to the agriculture end user. A number of ideas were discussed and the main idea settled on to reflect the priority hazard that most of the experts settled on, would be drought monitoring and early warning for agriculture, and the subsequent advisory services. This idea will be further developed post-roundtable meeting between the organisers, the invited experts, and the representatives of the participant countries.

In conclusion are the following three key statements from the expert roundtable:

i. There **exists a need** to support agricultural end users. The driving needs are many (such as productivity, total loss risks, commercial/subsistence livelihoods/food security), however given the concern that climate change and variability have great exposures to food security, the agriculture services and climate services communities understand that the sharing of expertise of their technical assets and expert capacities have great potential to aid the users of agricultural information with decision making regarding weather and climate related risks and natural hazards.
ii. There is much to **share between agriculture and meteorology** potentially resulting in greatly **enhanced support** to the **end user.**
iii. There **exist opportunities and interests** at regional level to support the ongoing national effort on the ground.

Moving forward

A few key items were listed as achievable items for action by all present agencies, both national and regional. These activities are listed as follows:

a. Agencies (regional and national) need to term this relationship and interaction with each other as a collective e.g. PICS Panel, FSPF, PMC – The experts and sponsoring agencies understand that this new collaboration is resulting in a relatively new work space i.e. there is no ready existing partnership that looks after this interface of work areas between agriculture and meteorology. There are however very many other ready bodies that can take on aspects of the

disciplines of each. The sponsoring agencies can take a lead on establishing some of these links first.

b. Champions are needed (and identified) to form the collective (Ag + Met) spearhead in this work space – The invited countries (Vanuatu, Samoa, Tonga) have some forms of collaboration underway between Agriculture and Meteorology. The invitation is to the invited members of these countries to the Roundtable to volunteer to form a collective of champions that will be supported by the sponsoring agencies in moving forward the outputs of this roundtable meeting. It was suggested that WMO and USP be added to the technical partners list to assist in pursuing the follow up of the project.
c. Highlighting risks/opportunities for the collective – Further to the above work, one of the next steps is for all involved to term out an early and general SWOT exercise to identify the current context of the workspace, and the future case for its work.
d. Long term goals and vision – As the above exercises progress, the group in this workspace will then find the appropriate context to develop the short-medium-long term vision and goals of the workspace.
e. Additional suggested next steps for further exploration are listed as follows, and this portion of the report acts as a temporary place holder for these ideas:

    i. Capacity development for agricultural services, communities and other end users/communicators (incl role of USP)
    ii. Best practices capture and options (incl guidance development)
    iii. Communications – strategies, roles, capacities
    iv. Data strategy: availability (formats etc), access, storage, analysis (USP)
    v. Crop modeling: capacity development; dissemination
    vi. Information needs [identification by end user]
    vii. Information and knowledge management
    viii. Regional partnerships/architecture/linkages [PICS and FSPG, tbd]
    ix. National-level mechanisms support: MoUs, platforms etc

f. Finally, is a stand-alone Action Plan needed, or is it redundant? –Considering the early point in (a) above, a few suggestions had been put forward that rather than creating a separate and stand-alone Action Plan, that the outputs of programme of the new workspace could be readily reflected and adopted into existing workplans of various key bodies of the respective work areas of agriculture and meteorology. For example, the PICS Panel could adopt and provide support to aspects pertaining to the climate services community, while the Food Secure Pacific Working Group could similarly do this for the agriculture food security

side. This particular point will be progressed as this workspace is further developed.

g. The meeting was then brought to a close with a final acknowledgement and thanking of the FAO for the kind funding provision in support of the travel (and other logistical arrangements) for those participants that had travelled to Samoa for the roundtable, singling out in particular Elizabeth Christy for her tireless work in facilitating the arrangements for the roundtable.