

문서번호 APCC-출장-16-0886(2016-08-22)

TRAVEL REPORT FORM

출장보고서

결 재	팀장	부서장	원장	
	08/16 김광형	08/18 김형진	08/22 정홍상	
협 조	부서장			
	08/18 유진호			

I. Reporter 보고자

Department 소속	Position 직위(직급)	Name 성명	Travel Date 날짜	Note 비고
응용사업본부 기후예측본부	사업기획팀장 선임연구원	김광형 김원무	2016/8/7-12	피지 워크숍

II. Major Activities 주요업무 수행내용

1. Main Contents and Activities 주요내용 및 활동

- UNESCAP-Capacity Building Workshop (8월9일-11일) 참석 및 발표
- UNDP/UNESCAP/RIMES 관계자와 프로젝트 협력을 위한 업무 협의

2. Relevance to APEC Climate Center's Activities 결론 및 소감

- 김원무 박사가 APCC 소개와 대표 해외프로젝트에 대해 발표
- UNDP 및 RIMES와 아태지역 재해조기경보시스템 개발에 관한 공동연구 협의 도출
- 그 외 다른 참석기관들과 공동협력 기회 논의
- GCF 바누아투 프로포절에 대해 협의 후 수정 등

* 자세한 내용은 첨부된 출장보고서 (Fiji ESCAP Workshop_Travel_201608_Final Report.docx) 및 첨부파일 (Attachment 1~4) 참조

III. References 참고사항

(with attachment of any information or report in case of attendance of conferences, workshops and meetings) 학술대회, 워크숍, 회의 등 참석 시 관련 정보 및 문서 첨부

1. Presented and Collected Materials 주요 수집자료

2. Suggestions and Remarks 건의사항

Travel Report: ESCAP-SPC Workshop

[2016.08.16. Prepared by Kwang-Hyung Kim @ Climate Application Department and WonMoo Kim @ Climate Prediction Department]

☐ Travel summary

1. Name and position of traveler(s): Kwang-Hyung Kim (Research Fellow, Climate Application Department) and WonMoo Kim (Research Fellow, Climate Prediction Department)

2. Destination and travelling period: Nadi, Fiji; 07 Aug – 12 Aug, 2016

3. Purpose of Travel:

- Attending and presenting at the Capacity Building Workshop: Building Climate Resilient Agriculture in Pacific SIDS (Nadi, Fiji; 9-11 August 2016)
- Meetings with UNDP, UNESCAP, RIMES, and other organizations for potential collaboration in Asia and Pacific region

4. Major Outcomes:

- Dr. WonMoo Kim delivered a presentation introducing APCC and its ongoing projects mainly focusing on ROK-PI CLIPS project, Tonga Agro-met Project, and other sectoral projects
- Confirmed a potential collaboration opportunity with UNDP and RIMES, which was initiated at the UNDP Regional Consultative Workshop on El Niño in Asia-Pacific (6-10 June 2016) by Ms. Bo Ra Kim and Dr. WonMoo Kim, and re-identified collaboration areas for each organization, that are focused on developing early warning systems
- Networking with other organizations for potential collaboration in the Pacific
- Refinement of the GCF Vanuatu proposal through discussions with the Director General and the chief agriculture officer of the Ministry of Agriculture, Vanuatu

□ Travel Note

ESCAP-SPC Workshop

The ESCAP-SPC Workshop is a sub-regional capacity building workshop with participation of key stakeholders from six high-risk / low-capacity SIDS in the Pacific (i.e. Papua New Guinea, Fiji, Solomon Islands, Tonga, Samoa, and Vanuatu), centered on sharing experiences, actions and identifying future strategies. [The workshop agenda is attached as Attachment 1 and the participant list is attached as Attachment 2]

Through the workshop, stakeholders working in climate-sensitive agriculture sectors of Pacific SIDS shared experiences and knowledge on best practices and strategies from Asia-Pacific regarding mainstreaming climate adaptation and climate-sensitive risk reduction strategies into sustainable and resilient agricultural land use planning [Detailed but crude meeting note is attached as Attachment 3]. Dr. WonMoo Kim delivered a presentation introducing APCC and its ongoing projects mainly focusing on ROK-PI CLIPS project, Tonga Agro-met Project, and other sectoral projects. It was a very good opportunity to advertise what APCC is and what APCC is capable of in the Asia-Pacific region to the participants [Presentation file is attached as Attachment 4].

Collaboration with UNDP and RIMES

We had a couple of side meetings with Dr. Srinivasan (RIMES) and Dr. Jegillos (UNDP) to discuss about a potential collaboration project on disaster early warning system on selected Asia Pacific countries.

Dr. Jegillos briefly explained about his broad idea about the potential project and collaborating areas that each participating institute can take in charge based on each one's expertise. Then, APCC suggested to provide climate information of downscaled seasonal forecast and possibly with spatial information on location(station)-specific variability and predictability of transboundary slow-onset disasters like ENSO phenomenon, and involving in NMHS capacity building. Since RIMES has long-term

experiences on national/community level forums like Monsoon forum or climate field school with stakeholders, they can be in charge of translating and delivering the climate early warnings to the end-users in a local community level. RIMES also mentioned about their tool for climate change scenario clipping in a country scale and downscaling the scenarios to higher resolution for climate change impact assessment. Lastly, UNDP contributes with their expertise on economic/social analysis of the consequences derived from the various decisions made by the end users based on the early warning information.

Target countries like Bangladesh, Viet Nam, Timor, PNG, and some other Pacific Island countries were identified. Project concept note will be drafted by Dr. Jegillos based on our conversation here at the meeting. He needs to discuss further with his program director and then he will be able to finalize the project concept note by the end of August for sharing with APCC and RIMES. One thing discussed was the funding for the initial works from each partner. Due to funding limitation from UNDP, the preliminary work (less than 1 year) from each partner will need to be self-funded. Once a concrete proposal is developed at the end of this initial activity, it will be submitted to other funding donors, mostly like GCF funding (UNDP is an implementing agency of GCF).

Dr. Jegillos suggested to have a regular meeting once a year together with RIMES for continued collaborations, so that whatever issues or potential projects come up on the surface, we discuss possible collaboration together. Best chances will be some regional meetings regarding climate disaster risk management in the region, where three organizations can attend. In this particular collaboration structure, APCC will mainly play a role in climate science such as forecast products and their tailored downscaling for the target countries.

UNDP recently signed a final agreement with GCF as an accredited implementing entity. It has already 5 projects approved with GCF funding to 4 Asia Pacific countries including Maldives, Viet Nam, and Tuvalu, and 1 African country. Although there is very low chance that APCC can be involved in those five GCF projects, it seems still possible to collaborate in a form of technical partner contracted by UNDP.

Overall, we will need to continue a strategic relationship with UNDP, UNESCAP, and RIMES for future collaboration opportunities in the Asia and Pacific region. From RIMES's positioning in relation to UNESCAP and UNDP, we can learn how important it is to be within their network for future collaboration in the projects.

Potential collaboration with UNESCAP

Unlike the initial expectation we had before the meeting, there was no one being aware of the previous talk between APCC and UNESCAP taken place at the UNDP Regional Consultative Workshop on El Niño in Asia-Pacific held on 15 June 2016 in Bangkok, where Bo Ra Kim and WonMoo Kim attended. In fact, Dr. Sanjay Srivastavas, Disaster Risk Reduction Section Chief of UNESCAP, who had discussion with APCC at the Bangkok meeting was not present at this time. Nevertheless, we discussed with some UNESCAP people and shared our expertise and ongoing projects in the Pacific. Some expressed an interest on collaborating with APCC for future projects in the Pacific.

In particular, we had a chance to discuss with Mr. Nokeo Ratanavong from the ESCAP main office in Bangkok, mentioned about having potential collaboration with the ongoing Pacific Island Regional Climate Outlook Forum. One suggestion was to collaboratively support the forum by providing institutional or technical support. It was agreed that strengthening existing regional platforms might be a good initial effort to start our collaboration in the region. In addition, Mr. Iosefa Maiava, Head of the ESCAP Pacific Office, suggested a regional level project involving the existing regional agencies like SPREP, NMHSs, WMO, APCC and RIMES, possibly applying for the KOICA funding.

Conversations with WFP, IFAD, SPREP, Vanuatu, and USP

■ WFP (World Food Program)

With Ms Sandra Uwantege Hart, Regional Cluster Coordinator

We discussed for a possible collaboration on disaster risk mapping for the Pacific countries, based on which the emergency food or cash allocation after a disaster event can be made by WFP. For example, identifying vulnerable hotspots for agriculture disaster.

Need to ask more about the specific areas of interest tomorrow.

■ **IFAD (International Fund for Agricultural Development)**

With Mr Sakiusa Tubuna, Sub-Regional Coordinator, (IFAD),

IFAD is currently conducting a project in Tonga, with a local NGO organization - MORDI regarding community level climate resilient agriculture. We were aware of the ongoing project and had a plan to connect the IFAD project with our Agro-met project. IFAD said they will have a follow-up project starting from 2017, which is almost 8 million USD funding. We discussed to have a partnership in relaying APCC's Tonga Agro-met products to the community level through IFAD activities. We also discussed about a possible matching fund project for Vanuatu. In reality, it will be very difficult for us to relay whatever the information we generated to the community level. So, it should be considered before starting the Vanuatu project. Continued contact with IFAD will be needed.

■ **SPREP (Secretariat of the Pacific Regional Environment Programme)**

With Mr Nihmei Kaniaha Salesa, Meteorology & Climate Officer

We discussed about a possible support of APCC for the next year RCOF since it is highly possible that the 2017 RCOF will focus on agriculture. Salesa indicated that there is no fund available for the RCOF at the moment. In this respect, if APCC can have a parallel training workshop with the RCOF, we can support travel fund to the same participants for the training and RCOF. For this, we will also need to discuss with UNESCAP (Mr. Nokeo Ratanavong) and RIMES (Dr. Srinivasan) together in terms of technically supporting the RCOF.

■ **Vanuatu MALFFB (Ministry of Agriculture, Livestock, Forestry, Fisheries and Biosecurity)**

With Mr Howard Aru, Director General and Mr Mark Vurobaravu, Principal Agriculture Officer

We had a meeting with the Director General and the Principal Agriculture Officer of MALFFB to further discuss about suggested activities on the GCF Vanuatu proposal. The

MALFFB officials indicated that some activities on the proposal (suggested by APCC from the last trip to Vanuatu) are unrealistic because they didn't consider the current level of MALFFB capacity and the national agriculture sector plan at all. Therefore, most activities had to be re-visited. Agricultural data digitization for DARD DB information system, crop estimation model development, and developing rice farming decision support tools were removed from the proposal. Instead, activities of enhancing capacity of relevant participants, delivering information to various stakeholders, and increasing sustainability of the project outputs were newly included based on strong requests from Vanuatu. Especially the Director General of MALFFB emphasized the development of usable tools, not just a bunch of useless scientific results. APCC responded to the very comment by including actual case studies of utilizing APCC's agro-met decision support tools in the proposal.

■ USP (University of South Pacific)

With Mr Viliamu Iese, Research Fellow, Pacific Centre for Environment and Sustainable Development

We had conversation regarding available crop models that had been developed in Vanuatu. Once we start the Vanuatu agro-met project, we will discuss with USP about utilizing the agriculture models that USP has developed in the region and also their existing network (Branch campuses) in the Pacific countries.

□ Potential Projects Identified

- Development of climate-related disaster early warning system in selected Asia and Pacific countries with UNDP and RIMES (Possibly starting in 2016)
- Technical and financial support for the 2017 Pacific Island Regional Climate Outlook Forum focused on agriculture, with SPREP and UNESCAP (Discussion needs to start before 2016 RCOF in Oct)

- Collaborative project with IFAD for the GCF Vanuatu project in disseminating climate service information to the community level (Once the GCF Vanuatu project gets funded, discussion should be started)

☐ **Action Items**

- I. Send Dr. Jegillos (UNDP) and Dr. Srinivasan (RIMES) a follow-up email with reminding note for the discussed collaboration project draft by Dr. Jegillos. Once the draft secured, we will need to discuss within APCC whether we agree on the activities of APCC on the draft and how to pursue the next steps
- II. Send Mr. Nokeo Ratanavong (UNESCAP) a thank you email with potential next steps for continued conversation around potential collaborations, especially on supporting the upcoming Pacific Island RCOF focused on agriculture together with SPREP and RIMES
- III. Send Ms. Hart (WFP) a thank you email with some risk mapping examples generated by APCC fellows to show APCC's capability on the risk mapping of vulnerable agriculture and water management areas
- IV. Keep updating with SPREP for the GCF Vanuatu project (with a preparation of MOU between APCC and SPREP) and possible support for the RCOF on agriculture in 2017

☐ **Group Photo**





Capacity Building Workshop: Building Climate Resilient Agriculture in Pacific SIDS

Nadi, Fiji

9-11 August 2016

Concept Note

Background

Agriculture in the Pacific SIDS is at an increasing risk from hydro-meteorological disasters; these risks are being magnified by climate change. To ensure inclusive and sustainable development, regional and international agendas including the SAMOA Pathway, the 'Roadmap towards a Post 2015 Integrated Regional Strategy for Disaster Risk Management and Climate Change in the Pacific,' the Sendai Framework for Disaster Risk Reduction 2015-2030, and the 2015 Paris Agreement under the IPCC, highlighted the need to integrate climate change adaptation and disaster risk reduction into SDGs to ensure integrated and coordinated actions.

The Pacific SIDS are impacted by the extreme climate variability, in part due to the frequency of El Nino events, and face significant reductions in their agricultural potential. Fiji, for example, experienced a significant decrease in sugarcane production, its main foreign export accounting for 12% of its GDP. In Vanuatu tuber crops have been the most affected while on Papua New Guinea, increasing rice production to satiate a local growing demand in face of climate variability continues to be a challenge.

In order to build a resilient agriculture sector in the Pacific SIDS, several key issues need to be addressed. These include (a) understanding the overall climate risk management systems for agriculture, (b) assessing key sectoral issues and challenges in climate resilient agriculture in the Pacific SIDS, (c) increasing knowledge and sharing of successful adaptation strategies for resilient agriculture from Asian countries, and (d) building stakeholder capacity for a resilient agricultural sector. To date, these factors have not been sufficiently acknowledged in agricultural sector planning in the Pacific SIDS, despite an overwhelming consensus that such integration is essential for the regions' resilience and long-term survival.

In Asia, there are examples of good practices, based on an understanding of climate monitoring and disaster risks, to customize these risks for agricultural sector such as successful cultivation of sugarcane in Indian coastal agriculture, agriculture policies in Indonesia where, after the experience of the 1997-1998 El Niño related droughts, climate resilient agricultural policies are backed by well-knit institutional arrangements horizontally across the sectoral ministries and from the center to provinces/ islands. Such experiences underscore the importance of the integration of DRR and climate change adaptation through fostering strong enabling environments, using the most recent scientific and technological advancements to support decision making and partnership with regional actors.

The proposed activity

To promote these practices, ESCAP is implementing a regional project 'Enhancing knowledge and capacity to manage climate and disaster risk for a resilient future in Asia and the Pacific' that employs a multi-sectoral, multidisciplinary approach towards building resilience.

ESCAP and SPC are jointly organizing a sub-regional expert group meeting on climate resilient agriculture as a south-south cooperation forum. The project will make use of current capacities through RIMES, which was established through the ESCAP Trust Fund for Tsunami, Disaster and Climate Preparedness, to generate seamless customized climate risk information in collaboration with the Pacific Community (SPC), the Secretariat of Pacific Regional Environment Program (SPREP) and other regional partners.

Outputs and Activities

Expected Outcome: Stakeholders working in climate-sensitive agriculture sectors of Pacific SIDS will gain an increased awareness and improved knowledge on mainstreaming climate adaptation and climate-sensitive risk reduction strategies into sustainable and resilient agricultural land use planning, based on the sharing of replicable best practices and strategies from Asia-Pacific.

Outcome of this meeting will provide substantive inputs to the subsequent regional forums including SPC/FAO meeting of the Pacific Heads of Agricultural Departments, and the Pacific Agricultural Ministerial Conference / Pacific Agriculture Week in Vanuatu in Mid-2017.

Activity: A sub-regional capacity building workshop in Fiji with participation of key stakeholders from six high-risk/low-capacity SIDS in the Pacific (i.e. Papua New Guinea, Fiji, Solomon Islands, Tonga, Samoa, and Vanuatu), centered on sharing experiences, actions and identifying future strategies. The workshop will promote the development of an Asia-Pacific inter-regional education and training network for climate resilient agriculture, and determine south-south cooperation modality as a way forward to encourage climate resilient agricultural practices in Pacific SIDS.

Tentative Programme

Tuesday, 09 August, 2016 - Day 1	
Time	Programme - Master of Ceremony: Iosefa Maiava
8:00-9:00	Registration of participants
Opening session	
9:00-10:00	- Welcome remarks by Mr. Iosefa Maiava, Head, ESCAP Pacific Office - Opening remarks by Dr. Ken Cokanasiga, SPC Suva Regional Office, Pacific Community (SPC) - Keynote address by H.E. Mr. Inia B. Seruiratu, Minister for Agriculture, Rural & Maritime Development and National Disaster Management, Government of Fiji
10:00-10:30	Morning tea and Group photo
Agenda Item 1: Overview of climate resilience and climate change adaptation in agriculture sector in Pacific SIDS; Chair - Iosefa Maiava	
10:30-11:00	1.1: Setting the context (15 mins/presentation): - Context of resilient agriculture in the Pacific (Dr. Ken Cokanasiga) - Challenges and opportunities for mainstreaming DRR in the agricultural sector (Mr. Nokeo Ratanavong, ESCAP)
Agenda Item 2: Knowledge sharing: Country perspectives on Climate resilient agriculture and adaptation strategies; Chair - Iosefa Maiava	
11:00-12:00	2.1: Roundtable 1 (20 mins/presentation) <i>Speakers are kindly requested to follow the guidance note provided for presentations</i> - Solomon Islands - Vanuatu - Philippines (Mr. Ricky Dador, Dumangas Agro-Met Station and Climate Field Schools)
12:00-13:00	Lunch
13:00-14:15	2.2: Roundtable 1 (20 mins/presentation) <i>Speakers are kindly requested to follow the guidance note provided for presentations</i> Fiji

	• Papua New Guinea • Samoa • India (Dr. V. Palaniappan, Centre for Ecology and Research)
14:15-15:15	2.3: Risk communication through institutional mechanisms: Experiences from Asia (Ms. Ruby Rose) • Monsoon Fora • Farm field schools <i>Group discussion and feedback from the experts on guidelines</i>
15:15-15:30	Coffee break
15:30-16:30	2.4: Interactive discussion between representatives from Pacific SIDS and resource persons from Asia to feed final recommendation and outcomes discussion for Day 3

Wednesday, 10 August, 2016 - Day 2	
Time	Activities
Agenda Item 3: Introduction to ESCAP/RIMES “Guidelines for Mainstreaming DRR and CCA in Agriculture Sector - Pacific SIDS context; Chair: Dr. Seumanutafa Malcolm Hazelman	
9:00-10:30	3.1: Assessment of climate features (Dr. G. Srinivasan) • Climatology • Climate drivers • Observed climate trends • Climate change projection scenarios • Climate impacts on agriculture sector <i>Group discussion and feedback from the experts on guidelines</i>
10:30-10:45	Coffee break
10:45-12:00	3.2: Climate sensitivity of agricultural sector (Dr. G. Srinivasan) • Crops • Livestock • Fisheries <i>Group discussion and feedback from the experts on guidelines</i>
12:00-13:00	Lunch
Agenda Item 4: Knowledge sharing - Organizational support to countries on facets of resilient agriculture; Chair: Dr. Ken Cokanasiga	
13:00-14:45	4.1: Panel presentation by SPC on programs building resilience in the agriculture sector in PSIDS • Building resilient agriculture in the Pacific (Mr. Gibson Susumu) • Agriculture Policies and ICT (Mr. Vili Caniogo) • Pacific agriculture statistics strategy for resilient agriculture (Ms. Anna Fink) • Role of SLM in climate change adaptation (Ms. Maria Ratutokarua) • Managing animal and plant pest and disease (Mr. Visoni Timote) • Pacific Organic farmers building resilience, Pacific Organic and Ethical Trade Community (Ms. Karen Mapusua) • Agro Biodiversity, The Centre for Pacific Crops and Trees (CePaCT) (Ms. Logo Waqainabete) <i>Discussion and Q&A</i>
14:45-15:00	Coffee break
15:00-16:30	4.2: Presentations by organizations on capacity building in the agriculture sector (10 mins/presentation) • SPREP: (Mr. Salesa Kaniaha) • USP: (Mr. Viliamu Iese) • PIRAS: (Dr. Seumanutafa Malcolm Hazelman):

	• IFAD: Building Resilient Communities: IFAD Experience in the Pacific (Mr. Sakiusa Tubuna) • PIFON: Role of farmer organizations in CCA (Mr. Kyle Norman Stice) UNDP Pacific Office: Risk governance to operationalize mainstreaming of risk into the agriculture sector (Ms. Nicola Glendining)
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Thursday, 11 August 2016 - Day 3	
Time	Activities
Agenda Item 4, cont.: Knowledge sharing - Organizational support to countries on facets of resilient agriculture; Tentative Chair: Nokeo Ratanavong	
9:00-9:45	4.3: Presentations by organizations on capacity building in the agriculture sector (10 mins/presentation) • UNDP: Capacity development on El Nino and extreme weather events (Mr. Sanny R. Jegillos) • ESCAP: El Nino Impact Assessment on Fisheries and Agriculture in the Pacific (Ms. Madhurima Sarkar-Swaigood) • APCC: Introduction to APEC Climate Centre (Mr. WonMoo Kim) <i>Discussion and Q&A</i>
9:45-10:00	Coffee Break
Agenda Item 5: Strategy discussion for establishing recommendations and outcomes for the Pacific Agricultural Ministerial Conference and promoting an Asia-Pacific inter-regional education network	
10:00-11:15	5.1: ESCAP/RIMES Climate information for resilient agriculture (Mr. Jothiganesh Shanmugasundaram) • Climate risk information system • Agriculture risk management for the observed climate variability • Application of climate forecast products in agriculture sector • Long term agriculture risk management <i>Group discussion and feedback from the experts on guidelines</i>
11:15-12:15	5.2: Matching session for SDGs and Pacific Indicators (SPC) <i>Discussion and Q&A</i>
12:15-13:15	Lunch
Agenda Item 6: Way Forward; Tentative Chair: Nokeo Ratanavong	
13:15-14:15	6.1: Discussion for implementing strategies and conveying outcomes for the Pacific Agricultural Ministerial Conference
14:15-15:00	6.2: Way forward 6.3: Closing remarks by ESCAP and SPC

Meeting Notes

Date: 9 Aug 2016

Opening session

-Minister: livelihood is very important in the Pacific. Most are smallholder farmers in the region. Therefore, whatever the development regarding a resilient agriculture is, we should focus on the smallholder farmers and their livelihood perspectives.

Agenda Item 1

1.1 Setting the context

1) Context of resilient agriculture in the Pacific (SPC) Ken

- Climate is changing together with food system changing (flowering, fruiting, animal behavior)
- Need enhanced understanding of exposure, sensitivities, adaptive capacity, uncertainty and risk in climate, adaptation decision making and policy
- Resilience: protection of the natural resource and biodiversity, new policy, strategies, tools and practice for adaptation.
- Resilience: persistence, adaptive, transformative
- CSA: increasing productivity, improving resilience(biodiversity, agroforestry, adaptation), reducing GHG emissions
- What to do: Mainstreaming CC interventions into national policies, development strategies, Community to be empowered, longterm resilience building process, Consideration of other drivers of vulnerability (pop growth, urban migration, NCDs)
- Discussion: Positive implications for CC existing, this should be taken advantage. Phenology data at SPC (there are tools to capture those data, will be presented tomorrow by Gibson)

2) Challenges and opportunities for mainstreaming DRR in the agricultural sector (ESCAP) Nokeo

- ESCAP's analytical work focusing on addressing the complexities of transboundary slow-onset disasters and bridges the knowledge gaps
- Economic impacts of disasters on agriculture: Medium to large scale disasters over the 2003-2013 caused USD 30 billion worth damage and losses on the agriculture sector (flooding and cyclone damage in order) – 42% on crops
- Vanuatu: Cyclone Pam 13.15 and 42.95 USD million damage and losses, respectively, in agriculture sector
- A ESCAP project: Enhancing knowledge and capacity for the management of disaster risks for a resilient future in AP. (Mostly for the development of national development plans and guidelines for mainstreaming disaster risk reduction)
- Develop system of monitoring and early warning using climate outlook, SCF, combined with near real-time satellite information and ground base data
- ESCAP strategy for DRR and CCA in agriculture based on GFCS: Warning, Monitoring and alert

(in season), National Monsoon Forum, and WMO RCOF in order

Agenda Item 2

2.1 Roundtable 1

1) Solomon Islands

- Most farmers have developed resilience by their own for a long time. Traditional knowledge is so important in this perspective. (Have you ever collected their resilience knowledge for broader application of their knowledge?)
- People: risk resilient development officer, resilience agriculture extension officers, capacity building in GIS(risk and hazard mapping), provincial officer
- Mechanism: Institutional arrangement (National development strategy, agriculture sector policy, provincial plan of action)
- Process: Support systems (Agriculture recovery action plan funding from SPC, through vertical linkages, community land use planning tools?, National development plan)
- What we need: People (capacity building needed for farmers and AEOs), Mechanisms (provincial livelihood cluster), Process (lack of community baseline data, information sharing between sectors)
- Coordination and harmonization needed in a national/regional level

2) Vanuatu

- National Climate Change Policy existing, National Agriculture Policy completed this year, Risk resilience unit established by UNDP (consultants hired for help), CPF in 2017
- Irrigation system with monitoring and early warning system (What percentage of agriculture area were irrigated)
- ICT Vanuatu: use ICT fully
- Recently after Cyclone PAM, allocated more funding to agriculture from government (to CSA initiative)

3) Philippines

- Climate field school(CFS) (Dumangas)
- Agriculture highly vulnerable to climate variability
- Farmers awareness on the weather elements, supply of weather/climate information
- Agromet station acts as a way of capacity building in forecast translation for key staff
- Bulletin with weather and climate information to farmers were generated
- CFS: 12 week course (regular), 16 week course (enhanced)

Outcomes: Synchronized planting, less use of pesticide, organic farming, nutrient management

2.2 Roundtable 2

1) Fiji

- Strengthening Institutional arrangement: National Climate Change Adaptation Strategy,

Agriculture 2020 Policy Agenda Land Water resource management bill, etc., Data available but not sufficient, Statistics Unit exiting, Farmers Baseline Survey, MoA has a DRM-CCA, Linkages to other agencies, Identification of cluster groups, Simulation exercises to build capacity (use of software system KOBO toolbox-infant stage)

- Strengthening production capacity and support system: Farming skills (SLM program, capacity building, Demo plots, participatory land-use planning), Productivity of the system (MoA's Food Security Program), Resilience of the system (Soil health program, use of mukuna beans, nitrogen fixing trees, traditional farming), GHG emission reduction (Redd+ project), Land productivity (soil analysis and fertilizer recommendation), Land use decision (90% of land under smallholder owned, 70% is marginal, 30% is arable land), Income/market access (farm access roads construction and maintenance, land development program, infrastructure improvement)
- Strengthening disaster management: Prevention/Preparedness (E-Agriculture strategy, Radio programs, Conservation programs), Mitigation, Response (food security cluster group, distribution of seeds/seedlings), Recovery (through radio programs, extension services)

2) PNG

- 81% of population in rural area (7.3 million)
- NARI (National agricultural research institute) under Department of agriculture and livestock
- Policies: National food security policy 2015-30, Nutrition policy, Seed policy, PNG vision 2050-climate change and environmental sustainability, National agriculture dev. Plan.

3) Samoa

- Strengthening Institutional arrangement: Sustainable management of the natural resource, Policy strategy (Agriculture Sector plan 2016-30), Agriculture survey 2015 (by Statistical Bureau of MAF), Stimulus package program (Cocoa, coconut, coffee, fruit trees), Cluster groupings (farmers associations, village communities, church youth groups, women's communities), Simulation exercises to build capacity (farmer field schools, community outreach programs)
- Strengthening production capacity and support system: farm household and community level, SLM practices, ensuring national biosecurity, Farmer trainings (PARDI-improvement of taro multiplication methods), Agroforestry to maintain soil fertility and reduce soil erosion
- Strengthening disaster management: CLEWS is working now to the community level, especially for TC

4) India

- CFS with help from RIMES
- Average expenditure for the training is higher than farmers income benefit.

2.3 Interactive discussion between representatives from PSIDS and resource persons

- RIMES

- 1) Resilience of agricultural systems-CSA
 - Farming communities have considerable resilience to the present climate variations?
 - Data requirements: collection, archival and easy access
 - Research-document and understand changes in flowering and other phenology, climate sensitivity and impacts on agriculture, fisheries, livestock
- 2) Mainstreaming climate interventions
 - operationalizing policies and plans-a big challenge
- 3) Sustainable management of systems
- 4) Introduction of traditional and multi-cropping
- 5) Funding support
- 6) Treatment of uncertainties
- 7) Coordinated/holistic approach- Who at national level
- 8) Global, regional, national, and community level connect to manage risks and make use of opportunities
- 9) Cluster group
- 10) Empowerment of communities
- 11) Capacity development
- 12) Farmer field schools (its challenges for adoption)

Date: 10 Aug 2016

Agenda Item 3

3.1 Assessment of climate features (Dr. Srinivasan)

Guidelines for mainstreaming disaster risk reduction and climate change adaptation in agriculture sector (draft)

- Climate->Risk/Opportunity->Agriculture : Three main elements for the mainstreaming
- step 1 Assessment of climate features; step2 Assessment of climate sensitivity of agriculture sector; step 3 Application of climate information for resilient agriculture; step 4 Risk communication
- Climate Risk Management: Decision based on the predictability of forecast will be depending on cost of the dress you wear, importance of the event, your mood, etc. Per specific application event, the decision making will be different depending on the event context, so it is important to understand the decision making process for the specific situation
- Climate information available for agricultural decision making: past historic climate, monitored weather information, forecast information
- RIMES is also involved in WMO GFCS initiative in Asia region, including RCOF and NCOF

→Group Discussion for Vanuatu

- Wet(Nov-Apr)/Dry(May-Oct, Cooler/less humid) season
- Expecting TC, there are ways to prevent crop damage or loss? Not much ways to prevent

(pruning)

- Met and CC information for Vanuatu (from PACCSAP report and VMS website)
- General CC information and project information for Vanuatu
(<http://www.pacificclimatechange.net/country/vanuatu>)
- Cassava is the most important crop in Vanuatu
- Microclimate is very critical, thus this information would be needed
- Accessibility to the Climatology and CC information would be enhanced (through AgroMet website, there should be a menu where all the available information is gathered)
- Group Discussion for Solomon Island
- Weather Information distribution to farmers through media every day and month
- Group Discussion for PNG
- Rural area weather data collection is needed
- Drought has more severe impact than Wet (Land slide)

3.2 Climate sensitivity of agricultural sector (Dr. Srinivasan)

- Crop-weather calendar should be accessible by farmers (For important crops, basic climate information re crop growth (growth stage water requirement and water stress, optimum temp. rainfall amount, marginal temp. for each growth stage, etc) would need to be documented and provided by the website)
- Data and research important to build bridges for effective use of climate
- Simpler steps to begin the main streaming process that can be easily scaled up to plug-in complex simulation models
- Better coordination through user interface platforms-like climate outlook forums and farmer climate field schools
- SESAME: 3-10 days weather forecast and observation data input, location/crop/crop calendar, 3 day forecast information and 10 day agromet bulletin outputs → Web-based decision making system by RIMES

→Group Discussion for Vanuatu

- Staple crops + cash crops
- Crop calendars will be changed based on seasonal/interannual climate variabilities
- Information on drought/flood resistance of each crop and variety will be critical to have
- How do you get the climate information and often interact with NMS, since most information is there

→Group Discussion for Samoa

- Island and provincial (village level), specific impact and timeline should be discussed
- Crop calendar (availability and accessibility are important)
- Experienced farmers may have knowledgeable information to help others
- Climate change impact on crop harvesting

→Group Discussion for Solomon Island

- Crop-Weather calendar: water/sunshine/temperature requirements per crop stages, different cropping systems (plantation, smallholder farming, etc) need to be differentiated

3.3 Risk communication through institutional mechanisms: experiences from Asia (Ruby)

- So many information generated by NMS, but users cannot incorporate those information for their decision making. There was a huge gap in application. Information available, but not suitable to users (not tailored to users). Information disconnect in the community level. Seasonal outlook (AN, NN, BN)-understanding of this information is not there at the community level. Farmer knows that they need to harvest now, but the price for harvesting(mechanization and labor cost) at that time was very high.. So information is there, but the other things don't help them to make a decision.
- Regional climate outlook forum-→Monsoon forum (Sectoral application level)-→Farm school
- Monsoon(National climate outlook) forum: Institutional decisions polished here, forecast (3-10 days) and deliver the information, formulating potential impacts and management strategies, implementing management strategies, feedback of the consequences (performance, usability, information/capacity building requirements) documented and reported back to NMS. NMS's capacity building (based on feedbacks and demands from users)
- Sri Lanka case: irrigation management-successful story based on seasonal forecast.
- Farm school is complemented by the decision making tools like SESAME (very specific for the area in the Myanmar)
- Reference this slides very thoroughly

Agenda Item 4

4.1 Panel presentation by SPC on programs building resilience in the agriculture sector

- Development of P-SPAFS (Agstats strategy) from PAFF project: Technical Working Group (Maniaia Tonga involved), Production statistics, Monitor resilient agriculture(changes in use of input)
- Seed bank: cost 15,000 USD to get 6,000 taro planting material with 5-6month tissue culture period, may need to request through MAFFF
- Promoting agroforestry (Ask Maria at SPC about this→ located in Suva, Fiji, so anytime visiting might help to get all those information (electronic forms) with pre-calling)
- Vulnerability of Pacific Island agriculture and forestry by SPC (2016)
- Participatory land use planning (soil map gis information) → Only for Fiji at the moment
- Topography, hydrology, soil-crop suitability map?
- Mucuna (fallow plant)
- Tonga Agriculture Policy Bank (website from SPC)

4.2 Presentations by organizations on capacity building in the agriculture sector

- Increasing demand for ICT technology for extension works

- PIRAS (Dr. Hazelman) to promote extension excellence for prosperous and resilient communities (published a book 'Pacific Island Extension Strategy')
- IFAD a project in Tonga with MORDI, Tonga Rural Innovation Project (TRIP) for 60 communities in Tonga (comp1-community development)
- Features of TRIP: Building a resilient person, holistic-integrated, empowerment of communities, strengthen traditional cultural and farming systems, leverages donor funding, strong links to the private sector, sustainable-links to current government programmes, leverage funding from community locally and abroad, strong ownership by the community
- Another 8 million funding from IFAD for outscaling in Tonga from 2017? Need to talk to MORDI for a possible collaboration, utilizing their structure to disseminate ToCSA information to communities
- PIFON (a book published by BoA about Climate Change impacts: Adapting pacific agriculture and forestry to climate change-recommendations).

Date: 11 Aug 2016

4.3 Presentations by organizations on capacity building in the agriculture sector

-UNDP (Sanny): Post impact from El Nino event lasts quite longer, especially social/economic aspect of the impact. Recovery from the impact of El Nino is critical thinking of the upcoming future event, thus we need to identify how the El Nino affected society and each sector specific, what were our observation regarding the El Nino event for the region and countries. Other natural disasters like TC and drought take place in accordance with the El Nino event, indicating the event amplifies other disasters. Therefore, humanitarian effort should be developed. Need for actionable data. El Nino is not just a simple problem of natural disaster. It is a challenge in terms of institutional arrangement. Why impact is so severe in certain countries? Assessing societal impact or sectoral impact from El Nino will be done with RIMES. What are the best practices from this success stories, so that we can amplify those efforts to prepare better. Capturing social media to gather information or data on the impact of El Nino will be done. Better prepared for the next El Nino (multi agency study will be done with UNDP, UNESCAP, RIMES, and APCC)

-UNESCAP (Madhurima): how to assess risk and losses on agriculture? Three key questions are how much at risk, how much was lost, how much likely to be lost in the future? In India, high conc of phytoplankton in the Pacific ocean is related with El Nino, which directly affects fishery industry. Determining global risk for fisheries during the 2015/16 El Nino year using remote sensing technique measuring Chlorophyll conc in the ocean. This information can also help fishery industry to cope with specific situation. Average Annual Loss (AAL) in agriculture sector for essential infrastructure and crops can be measured, which potentially predict the impact of El Nino on agriculture. El Nino amplification factor can be also used in a way (AAL*amplification factor).

-APCC

📌 APCC's unique position among other players in the region

- We do produce climate forecast information, subseasonal to seasonal scale, and also climate change scenarios. Furthermore it's possible for us to do additional works to improve its predictability if it's required for better decision making. There are multiple ways that we have in order to increase the forecast predictability. And we downscale the climate information for sectoral use using more than 10 spatial/temporal downscaling methods. Because one or the other can be suitable for specific sectoral application.
- We do use various sectoral models to generate value added climate information, which can directly be used for actual decision making from each sector. From crop models to pest/disease, water resource models, and even ground water, sea water intrusion models, climate risk mapping as well as sector specific risk mapping are available. Genome level research on fish adaptation is also taking place. Drought, flooding, land slide have been successfully simulated in many projects using integrated modeling approach including machine learning, satellite, mechanical and statistical models. Currently we have ongoing projects on climate, agriculture, water resource, and disaster in the Pacific countries.
- Has strong network with NMS in the region and support capacity buildings through various training workshops and programs. We recently applied for a 3 year KOICA training programs regarding climate change adaptation for the Pacific NMS and application sectors.

Agenda Item 5

5.1 ESCAP/RIMES Climate information for resilient agriculture (Mr. Jothiganesh, RIMES)

- Minimize climate risk and maximize climate opportunity
- Vanuatu had a climate field school before (you knew that?)
- RIMES has been an active player in the area of climate services for sectors (eg SESAME, CDAAS: Web based one stop climate data portal for customized spatial and temporal - a limited access by NMS)
- Questions for discussion

1) What are the climate parameter do you use in agriculture sector? How do you make use of the climate data for decision making in agriculture operation?

1-1) How to get access to the information, what information should be delivered to each level of stakeholders?

2) How climate information are used to plan, take decisions and carry out actions at national, subnational, farm level? (Feedback loop-dissemination of information, systematic documentation)

3) What are regional cooperation activities exists in terms of tools, framework, capacity building activities, to mainstream disaster risk reduction and climate change adaptation in agriculture?

5.2 SPREP presentation

- Climate information and product is not service unless they are used for user decision making
- CLEWS: put today's weather into the context of the past climate record, Sectoral application
- Vanuatu livestock is very important to consider

- 2012 and 2013: there were three agromet summits in Vanuatu. Agromet bulletin for farmers, ENSO sector action booklet, community based rainfall network, community based farmers field school, resource materials (animal feed, food replication), communication, partnership and engagement strategy
- Climate Nasara: describe ENSO in Vanuatu (www.youtube.com/watch?v=AMthanwiOWE)
- Get the Climate change in agriculture (proposal) from Salesa
- Train agriculturalist from MoA for climate information and WMO training, etc. to raise him/her as an agro-met specialist.
- NCOF established already in Vanuatu, Kiribati, and PNG, soon in Fiji (Oct) and Tonga (Nov)
- National Framework for Climate Services was already developed in Vanuatu
- Raise champions on the resilient agriculture through motivated farmers especially commercial farmers, and then the success story will be relayed to other less motivated farmers. But be careful the incubation of champion to be systemized, so that it becomes sustainable.
- Draft report will be circulated to the participants for correction in a week.
- Sharing lessons learned from each project is very important and make people interested
- 2017 Agriculture Ministers Meeting in Vanuatu will be held, hosted by FAO and SPC

APEC Climate Center

What we can do FOR YOU

August, 2016

CONTENTS

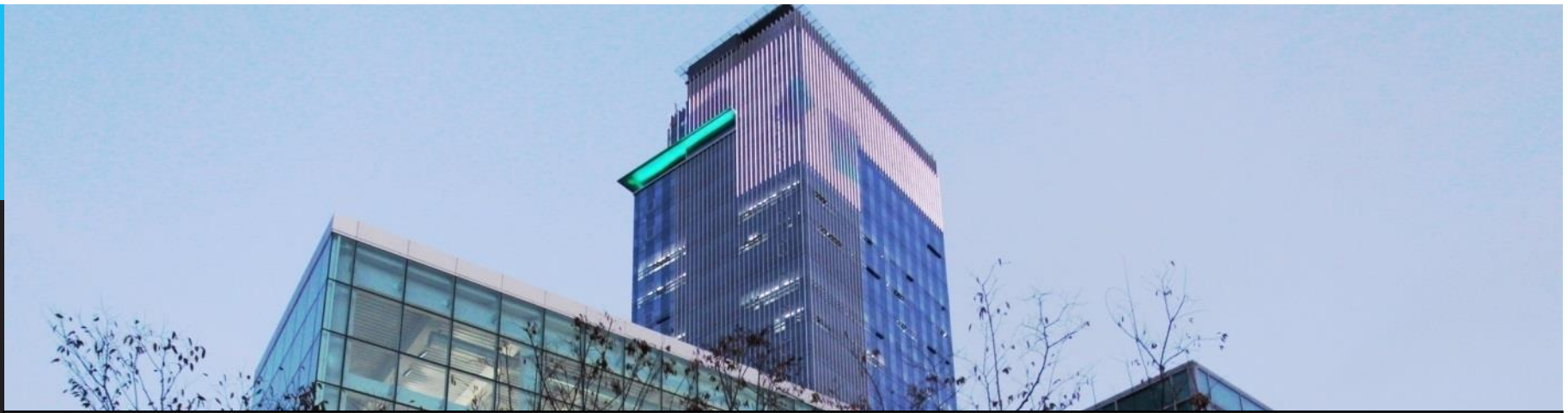
I. Who we are: APEC Climate Center (APCC)

II. What we do, generally:

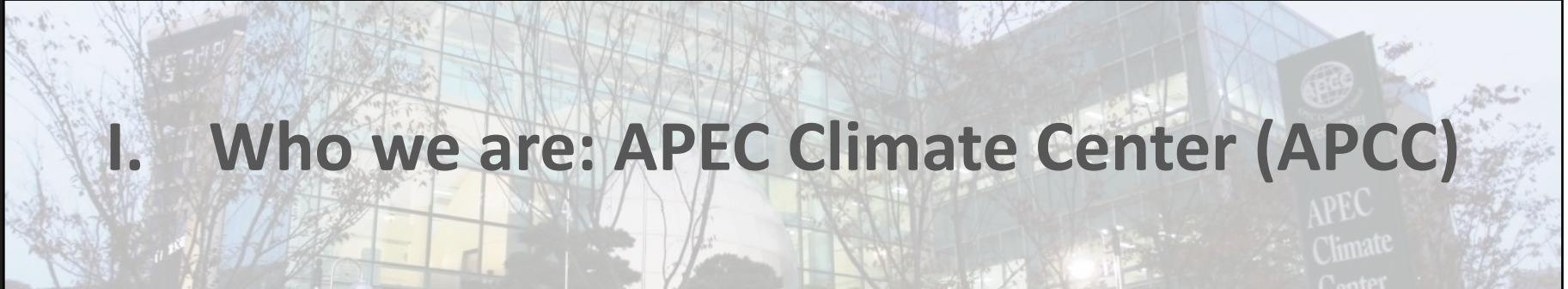
- ✓ Climate prediction
- ✓ Climate information services
- ✓ Interdisciplinary research
- ✓ International cooperation & Capacity building

III. What we can do FOR YOU, specifically:

- ✓ Pacific Island climate prediction service (ROK-PI CliPS)
dynamical-statistical downscaling of seasonal prediction for Pacific Islands
- ✓ Agricultural & agro-met service/Water management in Tonga
Agriculture and water management, utilizing seasonal forecasts for Tonga

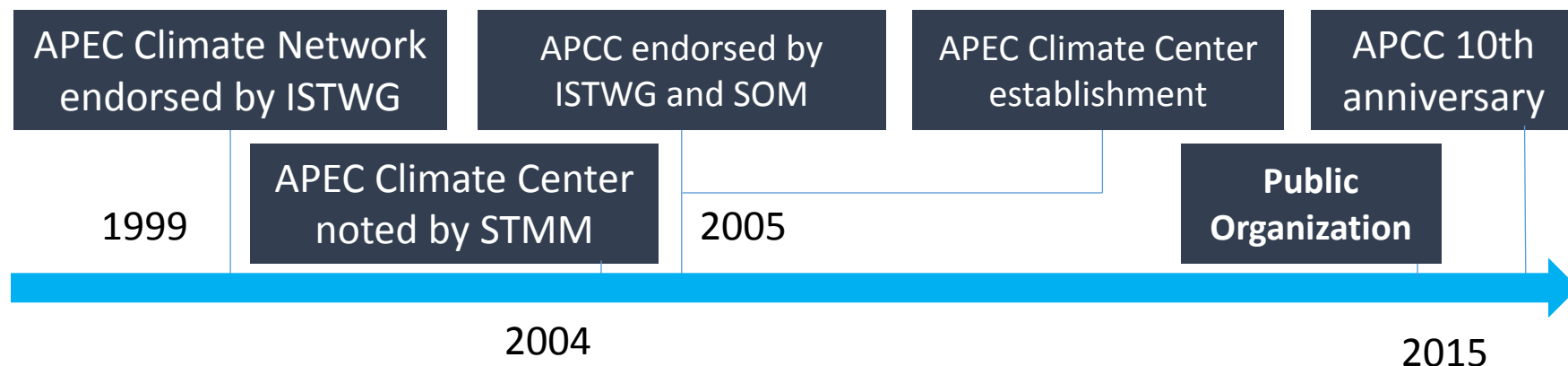


I. Who we are: APEC Climate Center (APCC)



Who we are

APEC Climate Center



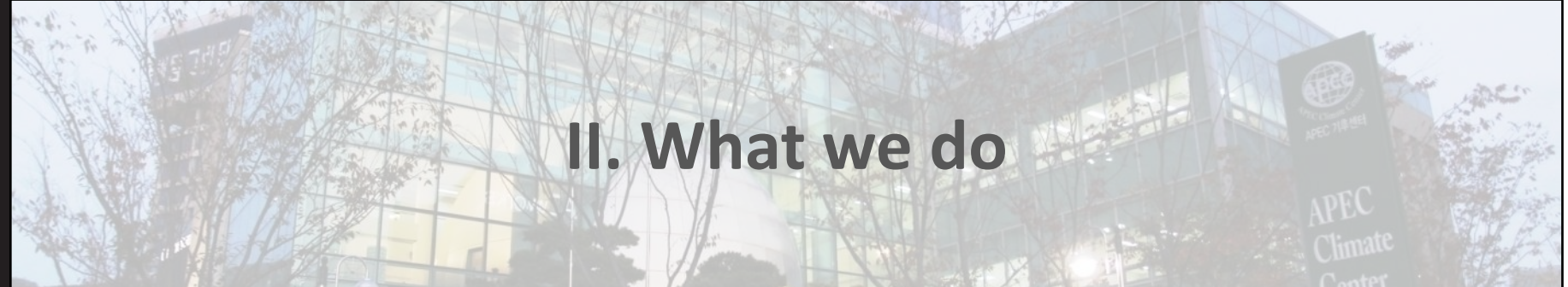
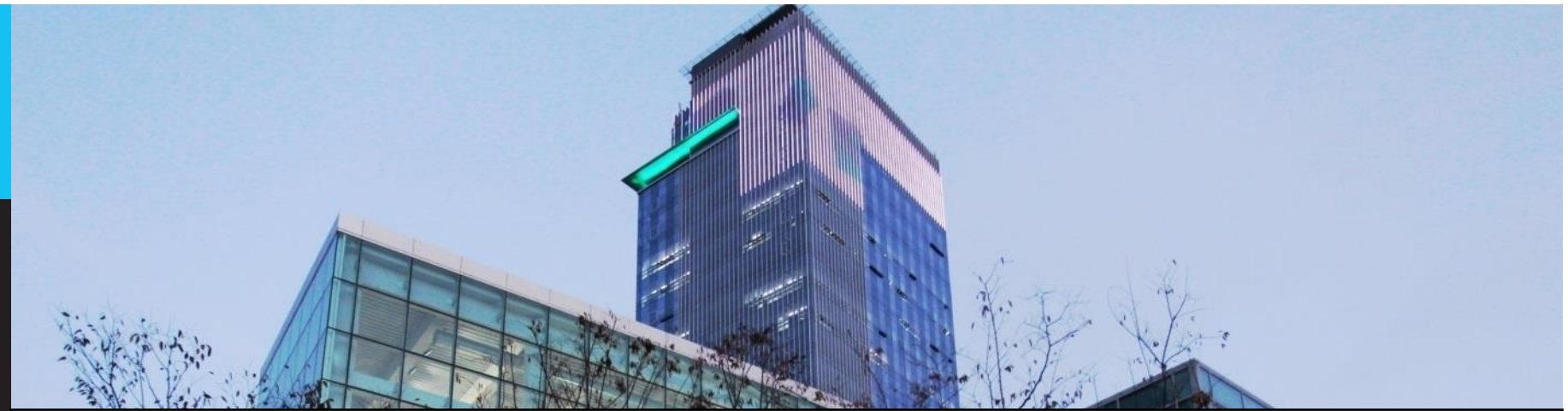
Our mission

The mission of APCC is to enhance the socio-economic well-being of member economies by utilizing up-to-date scientific knowledge and applying innovative climate prediction techniques through

- 1) Climate Prediction,
- 2) Climate Information Services,
- 3) Interdisciplinary Research, and
- 4) International Cooperation.

2005 SOM 1 for the 17th APEC Ministerial Meeting



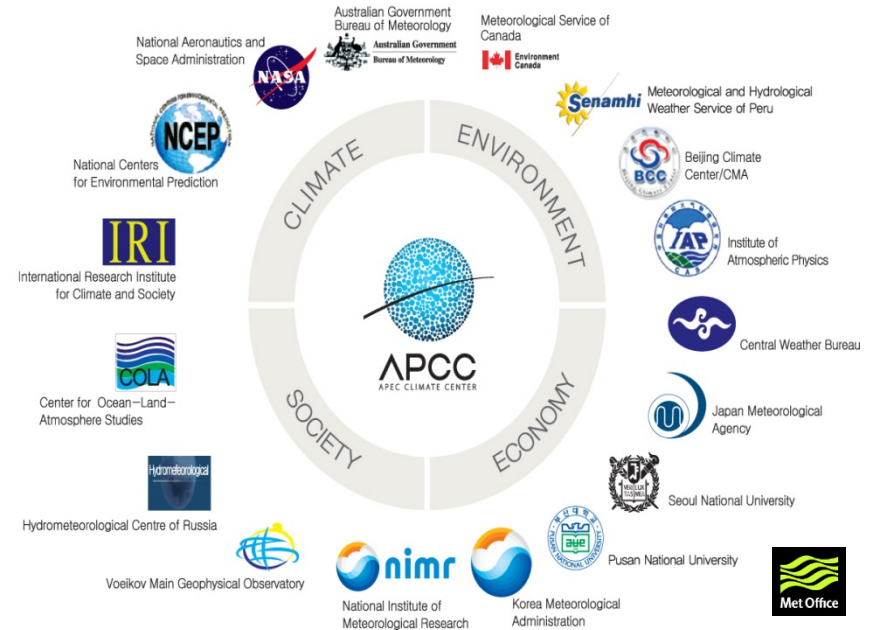


What we do

Climate Prediction

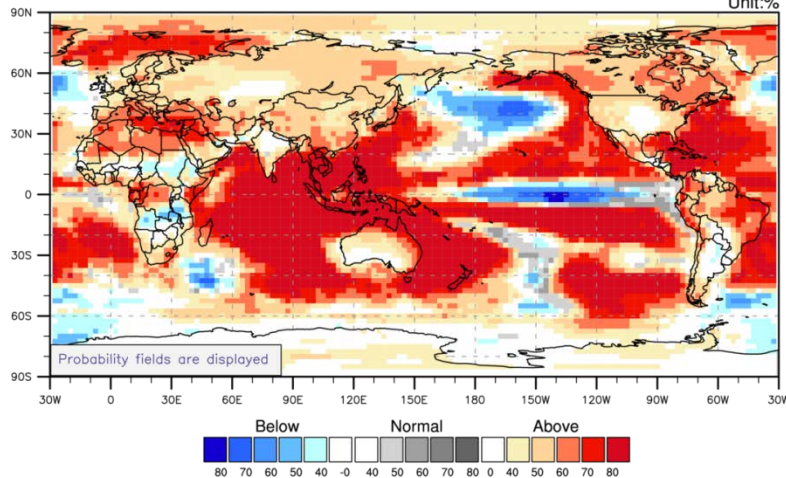
APCC has developed a climate prediction system based on a Multi-Model Ensemble technique, which collects seasonal forecast data from 17 institutes in 9 economies.

and it's the WORLD BEST !!



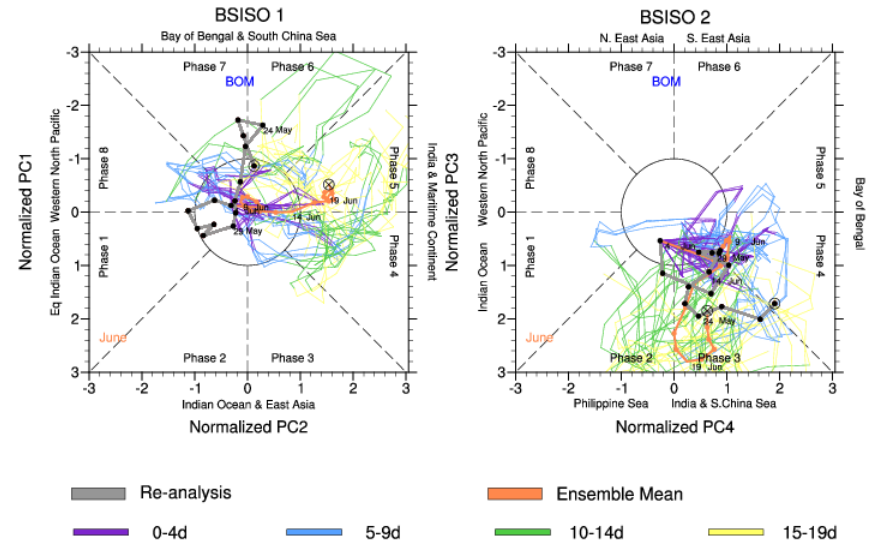
Temperature at 2m for June-August 2016

Unit:°C



© APEC Climate Center

BSISO Forecast for 5June2016-24June2016



© APEC Climate Center

What we do

Climate Information Service

<http://www.apcc21.org>

CLIMATE INFORMATION SERVICES



Seasonal Forecast



BSISO Forecast



Climate Monitoring



CLIK



Data Service

<http://www.apcc21.org>

MME Forecast

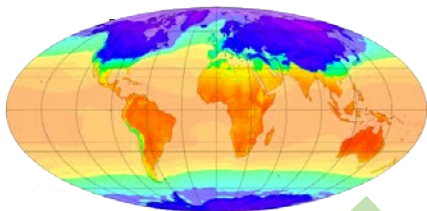
<http://cis.apcc21.org>

Climate information & APCC Data Service System (ADSS)

<http://clik.apcc21.org>

Climate Information toolKit (CLIK)

Climate Prediction



Food

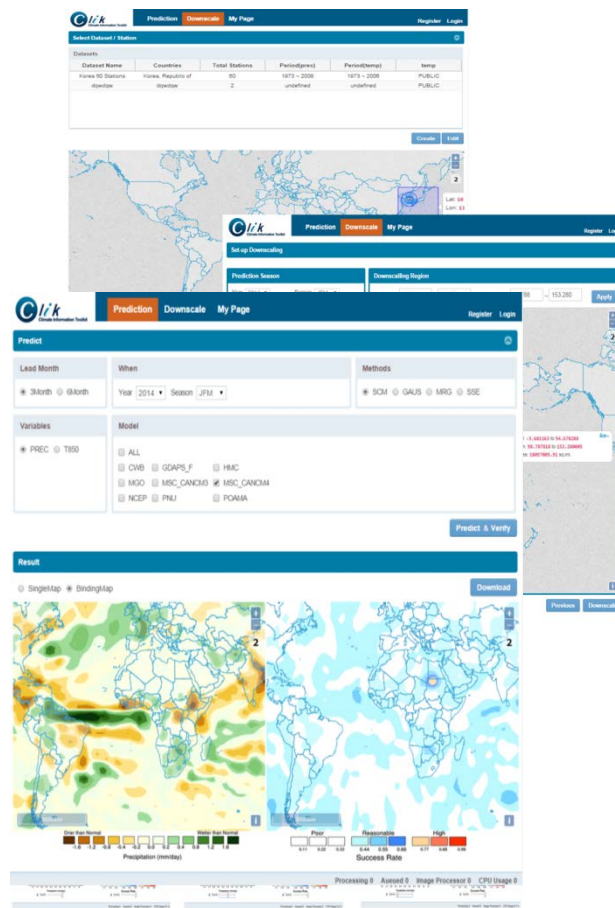


**“demand-driven” climate
information meets end-users’ needs**

Health



Water Management



What we do

Interdisciplinary Research

APCC-NCDR Project

“Pilot Study of Early Warning and Risk Assessment on Drought Disaster”

APN Project

“Toward a Fire and Haze Early Warning System for Southeast Asia”

ROK-PI CliPS Project

“Nationally Tailored Climate Prediction Information for Climate Change Capacity Building of Pacific Islands”

ASEAN Project

“Science-Based Disaster Management Platform”

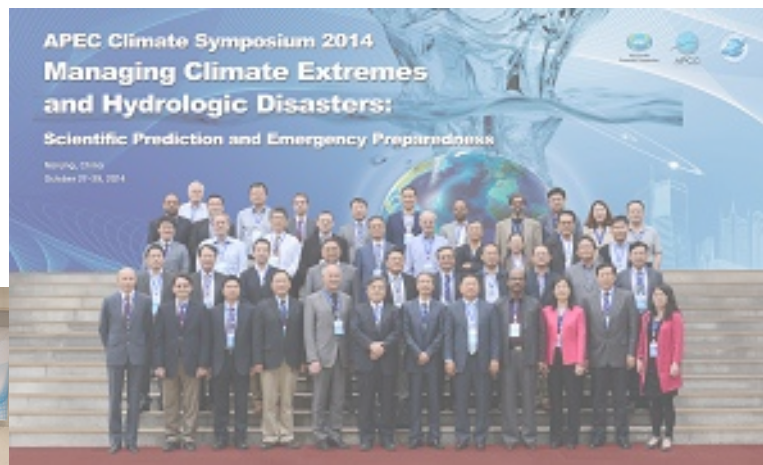
“Improving Agricultural Productivity through Ensuring Data Availability and Enhancing Climate Services”

APCC-CRIEPI Project
“Application of Seasonal Forecasts to Predict Electricity Demand in Japan”

What we do

International Cooperation & Capacity Building

- ✓ **APEC Climate Symposium**
- ✓ **APCC Expert Workshop**
- ✓ **International Conferences**



- ✓ **Training Program (1-week)**
 - During last 5 years, APCC has trained about 260 participants from over 50 countries
- ✓ **CLIK Training Workshop (3 days)**
 - Since 2015, APCC has trained Climate Researchers in National Met Services for Philippine, Indonesia, Vietnam, Thailand, Brunei.
- ✓ **Young Scientist Support Program (3-months)**
 - Since 2011, APCC has invited 65 young scientists from 26 countries

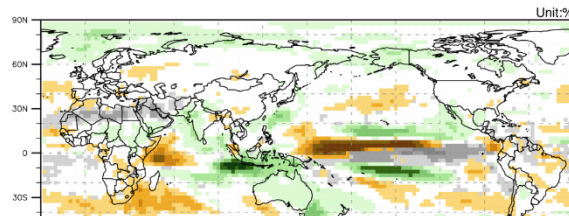


III. What we can do FOR YOU

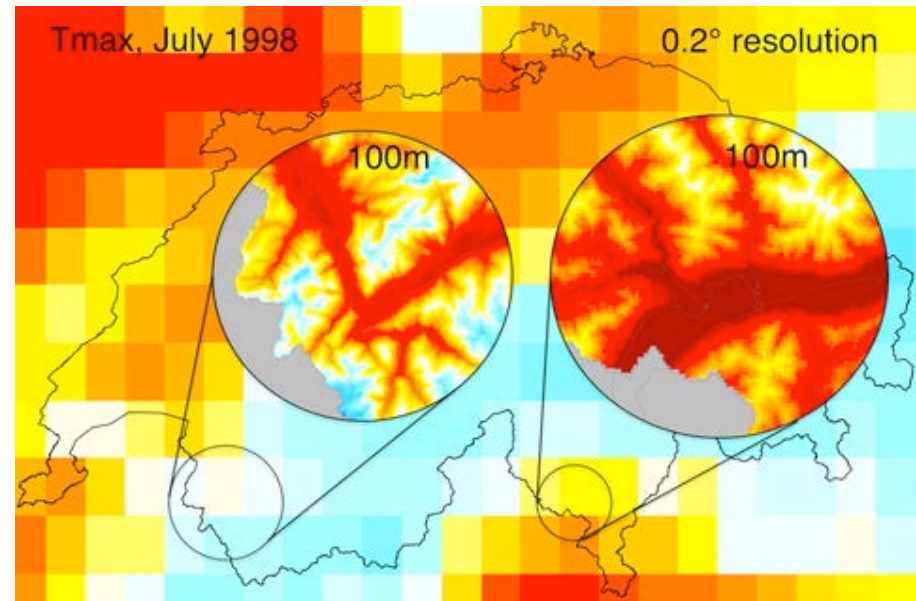
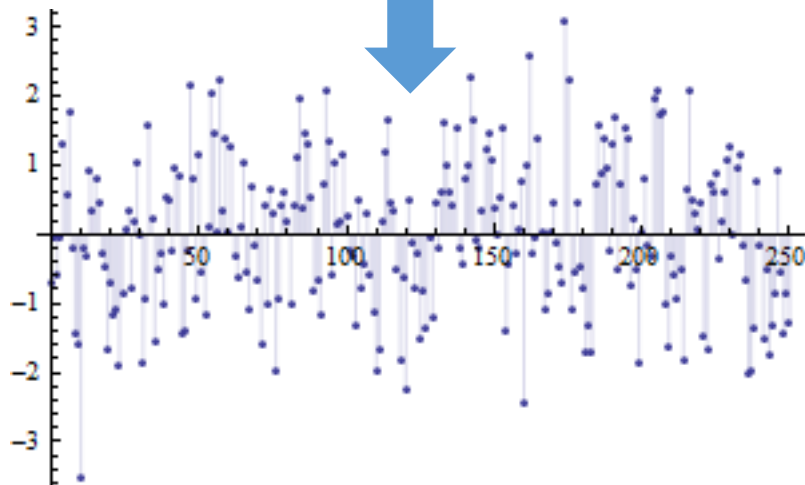
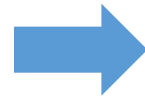
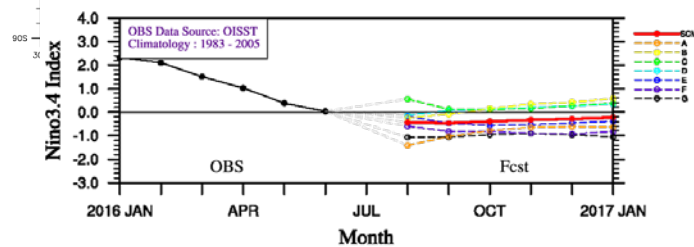
What we can do FOR YOU

From WHAT THEY PROVIDE to WHAT YOU NEED

Precipitation for August-October 2016



Nino3.4 Index for 2016 ASONDJ



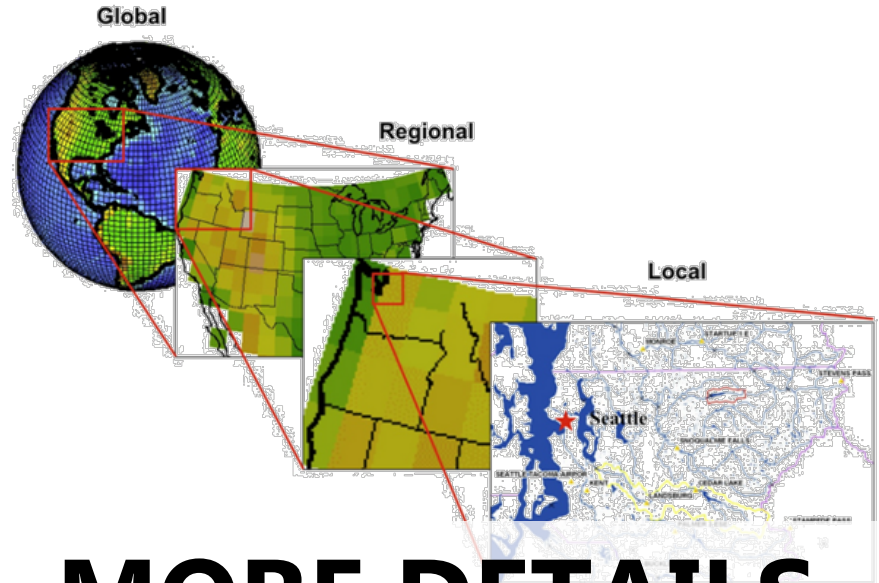
What we can do FOR YOU

Dynamical-statistical downscaling of seasonal prediction

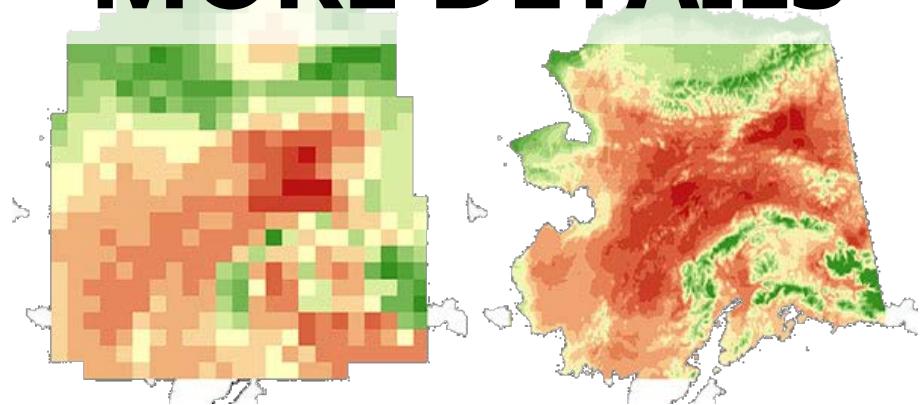
Tailoring climate prediction



Detailing spatiotemporally



MORE DETAILS



What we can do FOR YOU

Dynamical-statistical downscaling of seasonal prediction

1) Get a hint for selecting potential predictors:

Cook_Islands

91843

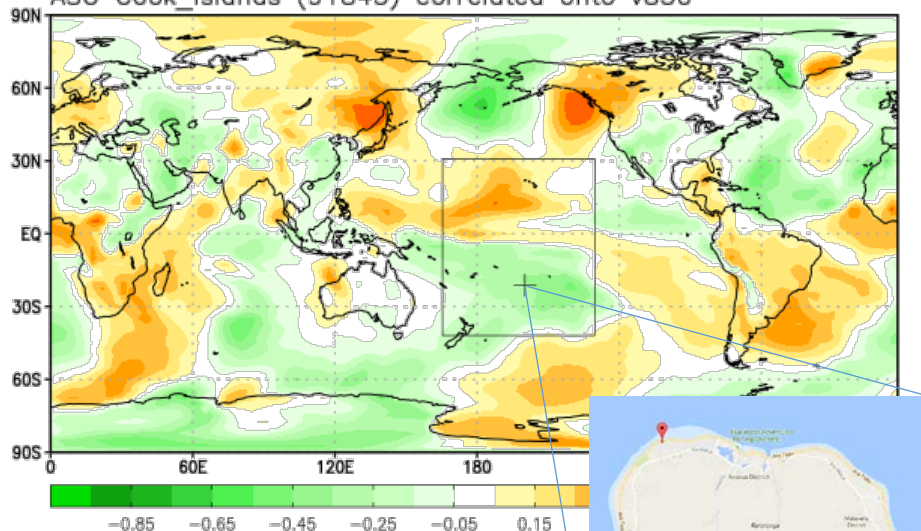
ASO

v850

PROJECT

2) Select your own potential predictor (PROJECT):

ASO Cook_Islands (91843) correlated onto v850



3) These are the selected potential predictors:

$x_1 = \text{AREAWE}(\text{prec} [175^\circ\text{W}-140^\circ\text{W}, 25^\circ\text{S}-15^\circ\text{S}])$
 $x_2 = \text{PROJECT}(\text{v850} [165^\circ\text{E}-130^\circ\text{W}, 40^\circ\text{S}-30^\circ\text{N}])$

4) Build your own statistical prediction model:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2$$

BUILD

Summary of APCC toySimulator results

The precipitation of Cook_Islands 91843 (ASO) is predicted to be 6.80692 mm/month using 2 potential predictors:

$x_1 = \text{AREAWE}(\text{prec} [175^\circ\text{W}-140^\circ\text{W}, 25^\circ\text{S}-15^\circ\text{S}])$

$x_2 = \text{PROJECT}(\text{v850} [165^\circ\text{E}-130^\circ\text{W}, 40^\circ\text{S}-30^\circ\text{N}])$

Pseudo Jack-knife hindcast temporal correlation skill* is 0.12.

Bayesian probabilistic forecast shows that this ASO precipitation is ...

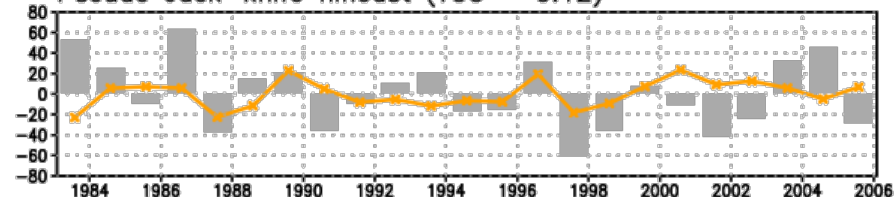
(+) 31.76%

(0) 33.04%

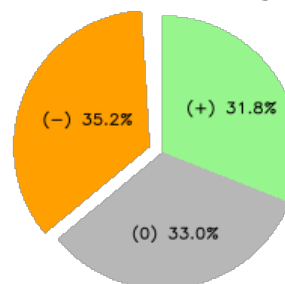
(-) 35.2%

*Note that these results are NOT actual prediction skill nor cross-validated.

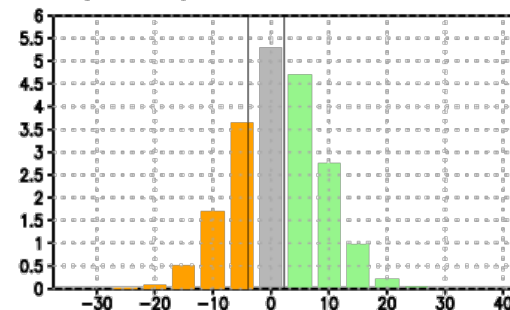
Pseudo Jack-knife hindcast (TCC = 0.12)



Tercile Probability

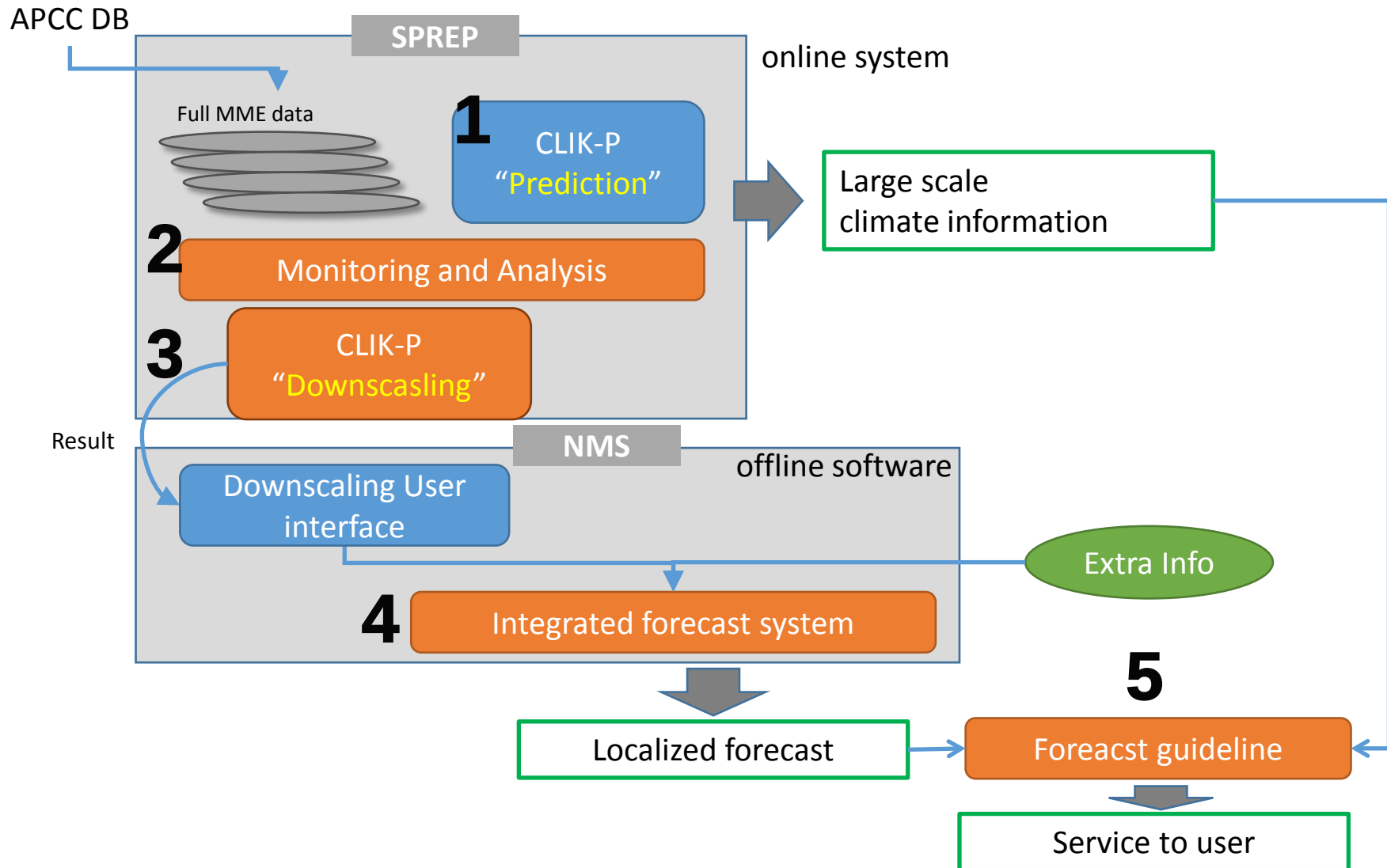


Bayesian probabilistic forecast



What we can do FOR YOU

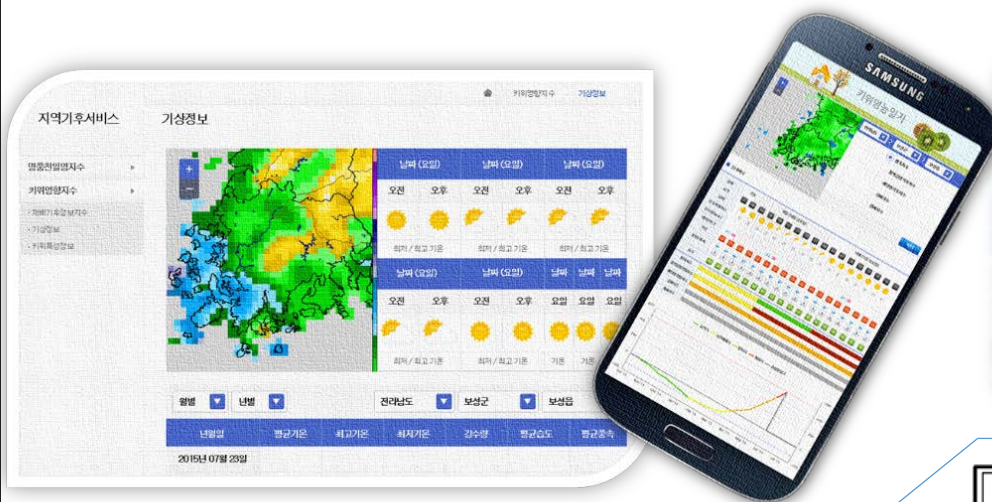
Dynamical-statistical downscaling of seasonal prediction



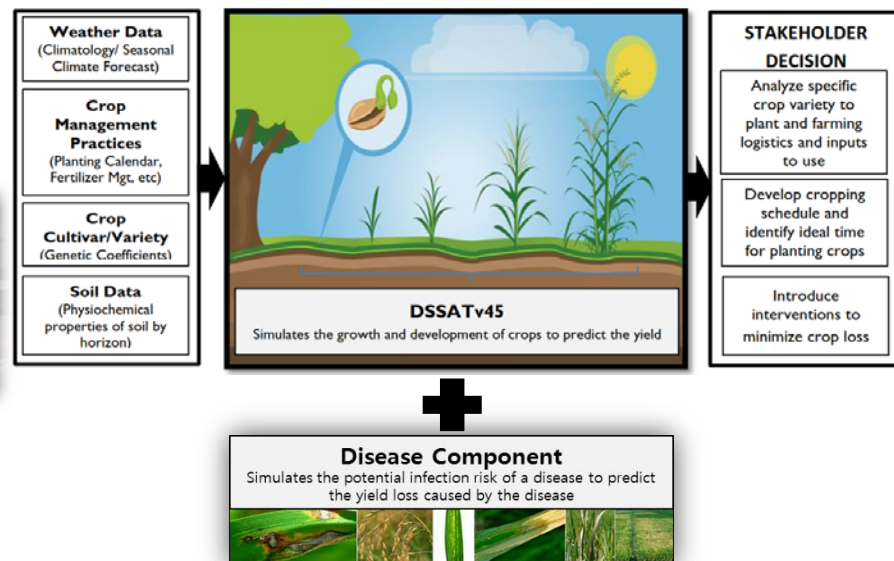
What we can do FOR YOU

Climate service for agriculture

“Climate Service for Kiwifruit Orchards”



“Rice Disease Early Warning in the Philippines”



What we can do FOR YOU

Project Tonga

Climate service for agriculture

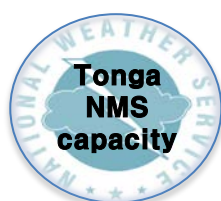
Improving Agricultural Productivity through Ensuring Data Availability and Enhancing Climate Services

- 
- A photograph of three men standing in a field. The man on the left is wearing a dark suit jacket over a light blue shirt and a yellow sash. The man in the middle is wearing a light blue shirt and dark trousers. The man on the right is wearing a light-colored short-sleeved shirt, a yellow sash, and a dark skirt. They are standing in front of a field of green crops, with a line of trees and palm trees in the background under a blue sky with some clouds.
- Tonga Meteorological Agency
 - Tonga Ministry of Agriculture
 - Improved agricultural data management system
 - Linked climate prediction and agricultural policy
 - Aim to create decision support tool for farmers (this year)

What we can do FOR YOU

Climate service for agriculture

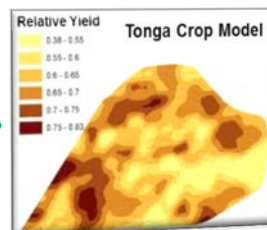
“Tonga Agro-met Service Project”



① AGRO-SECTOR CAPACITY BUILDING

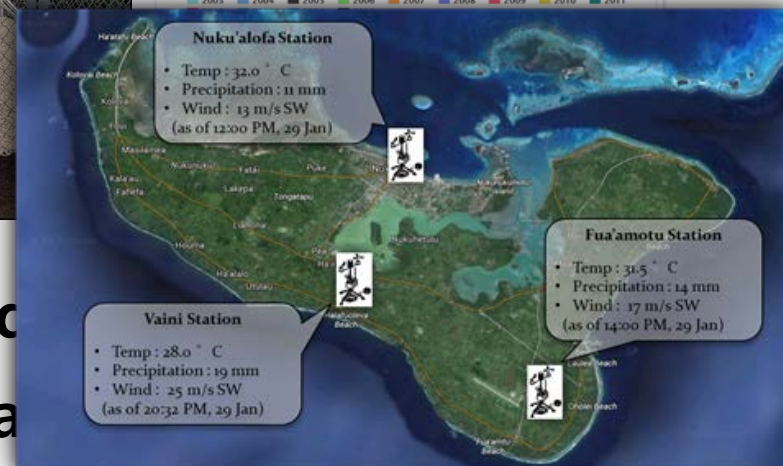
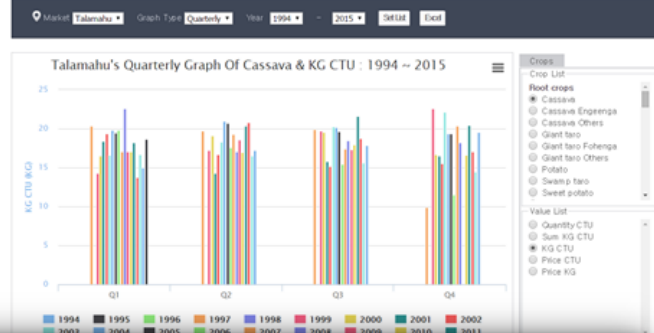


② CLIMATE SERVICES FOR AGRICULTURE



Tonga Agricultural information system

Market Graph

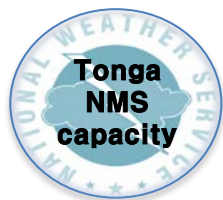


- Development of an agriculture c
- Generation of agro-met Informa

What we can do FOR YOU

Climate service for agriculture

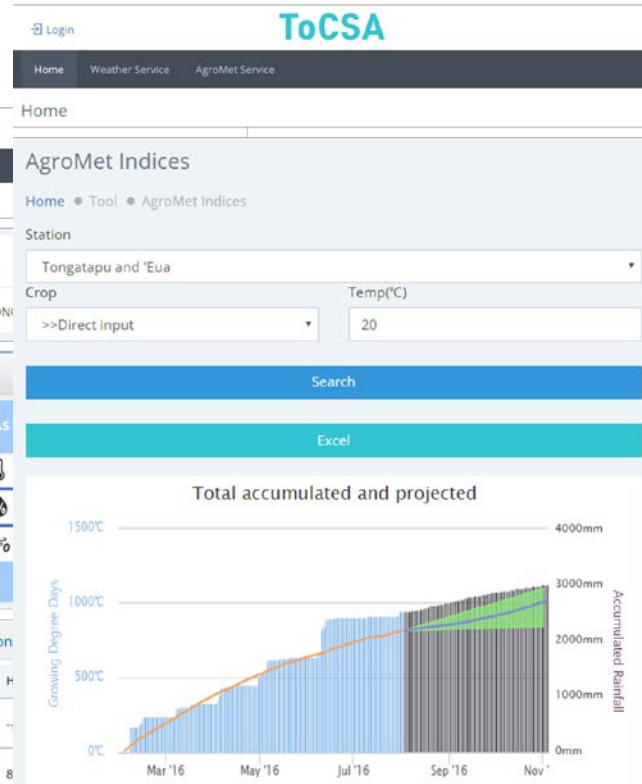
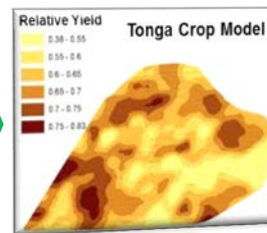
“Tonga Agro-met Service Project”



① AGRO-SECTOR CAPACITY BUILDING



② CLIMATE SERVICES FOR AGRICULTURE



- Research on the core relationship between climate and agriculture through model simulations and field trials
- Development of agro-met services (ToCSA)

What we can do FOR YOU

International cooperation for Climate Smart Agriculture (CSA)

“WMO GFCS Initiative”



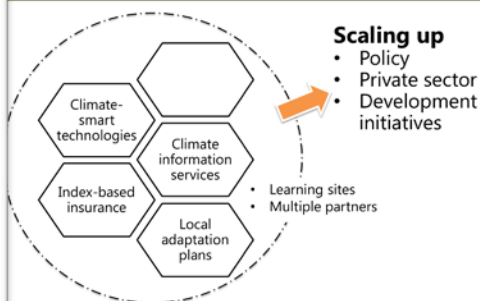
“APEC CSA Initiative”



What is **Alternate wetting and drying**

India: Weather-based insurance

Climate-Smart Villages (CSVs)



Now: How to scale up?

Scaling up strategies

CCAFS FP3, CCAC

Component of rice

1 must do, 5 reduction, INDC

Adopted as part of the

domestic policy(20-20-20)

GLZ project, WB project,

local governments

Before: Where does it work?

Reduces risks

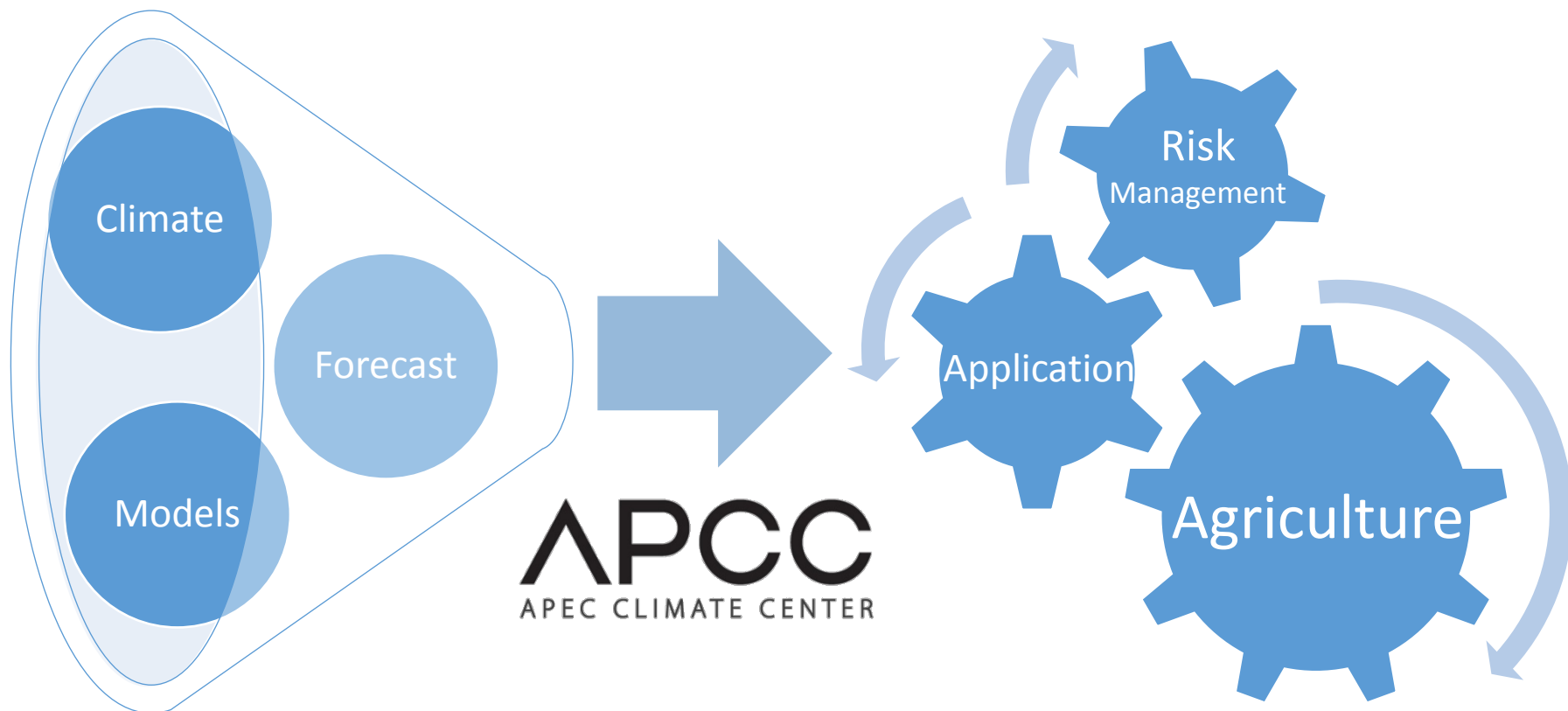
Reduce agriculture's

contribution to climate

change

What we can do FOR YOU

We make climate information useful, tailored for you!





THANK YOU

WonMoo Kim, Climate Prediction Department
T. +82-51-745-3996 E. WonMoo.Kim@apcc21.org W. www.apcc21.org