



World Meteorological Organization  
Organisation météorologique mondiale

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Weather • Climate • Water  
Temps • Climat • Eau

Our ref.: DRA-AP/RA V/AGM (survey)

GENEVA, 30 April 2013

Annexes: 2 (available in English only)

Subject: Questionnaire on Climate Services for Agriculture in Regional Association V (South-West Pacific)

Action required: Completed questionnaire to be returned to Dr Andrew Tait (New Zealand) not later than **30 June 2013**

Dear Sir/Madam,

You will recall that Regional Association V (South-West Pacific), at its fifteenth session (Bali, Indonesia, 30 April-6 May 2010) established the Working Group on Climate Services (WG-CLS). Dr Andrew Tait (New Zealand) has been designated as the Theme Leader in Coping with Impacts of Natural Disasters on Agriculture; Use of Improved Tools for Operational Agrometeorology; and Agrometeorological Information for Enhancing Farming Productivity within WG-CLS. The meeting of WG-CLS held in November 2011 agreed to produce a review document on the current provision and use of climate information and services for agriculture in RA V.

In this regard, the questionnaire developed by the Theme Leader and Mr Ravind Kumar (Fiji), Volunteer Expert in WG-CLS is given in Annex I. Responses to the attached questionnaire will be used as the basis for the review document. The review document will be published as a WMO publication in 2014 and made available to all participating Members. A completed questionnaire by the Fiji Meteorological Service is given in Annex II as an example.

In this connection, and to facilitate the work of the Theme Leader, I would appreciate it if you could return the duly completed questionnaire to the Theme Leader not later than **30 June 2013**.

Your cooperation in this matter will be highly appreciated.

Yours faithfully,

(E. Manaenkova)  
for the Secretary-General

To: Permanent Representatives of Members of Regional Association V (PSW-439)

cc: President and vice-president of RA V (for information)



## WORLD METEOROLOGICAL ORGANIZATION

DRA-AP/RA V/AGM(survey), ANNEX I

### QUESTIONNAIRE ON CLIMATE SERVICES FOR AGRICULTURE IN REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC)

#### Introduction

The WMO Regional Association V (South-West Pacific) Working Group on Climate Services agreed in November 2011 to produce a review document on the current provision and use of climate information and services for agriculture in RA V. This review document will be structured with country chapters, each briefly describing:

- the kind of climate information and products that are currently being produced (both general level information and agriculture-specific information) with examples;
- the ways such information is being delivered (again, both general level delivery and specific delivery to agricultural sector users);
- examples of the use of such information by agricultural sector users;
- some user feedback, where possible, on the usefulness of the information; and
- an evaluation of gaps and needs to improve the use of climate information for agriculture for the country.

The review document, which will be published as a WMO publication in 2014 and made available to all participating Members, will also have a synthesis section, highlighting good examples and identifying where there are significant gaps and needs across the region.

Responses to the following questionnaire will be used as the basis for the review document. The questionnaire has been designed by Andrew Tait and Ravind Kumar, RA V Working Group on Climate Services (WG-CLS). A completed questionnaire by the Climate Services Division, Fiji Meteorological Service has been provided as an example.

Name of Member: \_\_\_\_\_

#### Person filling out this form:

Title: Mr  Ms  Dr  (Please tick appropriate)

Name: \_\_\_\_\_

Organization: \_\_\_\_\_

E-mail: \_\_\_\_\_

Date: \_\_\_\_\_

(Signature of Permanent Representative)

# Current use of climate information and services for agriculture in RA V – Questionnaire

## 1. General Information

Please complete the following information (see Fiji example, for help):

Country name:		
Respondent name:		
Respondent organisation:		
Number of staff involved in providing climate services:		
Number of rain gauges / climate stations (total, and in agricultural areas):	Total:	In agricultural areas:

## 2. Climate Information and Services

Please give examples of the kind of climate information and services currently provided generally, and to the agricultural sector in particular. Please provide links to webpages, or provide other supporting information, if possible. Expand the size of the response box, if needed (see Fiji example, for help):

What kind of access to climate data do you provide? Is data access free, or at a cost?	
What kind of data products (e.g. plots or maps showing current climate conditions, and/or the difference from normal) do you provide?	
Please describe the seasonal climate outlook (including tropical cyclone outlook) material you	

provide, if any.	
If you produce reports on the climate of the previous month or season, or on recent extreme events, please describe them.	
What is the extent of information you have on the long-term climate patterns of your country, and on the effects of La Niña and El Niño? Is the information available to the public?	
What kind of scheduled reports and/or advisories do you produce?	
What kind of watches and warnings or alerts do you issue, if any?	
Do you provide any of the above information directly to users in the agricultural sector (perhaps as a special report or service)? Who are these users?	
Anything else (other climate services)?	

### 3. Delivery mechanisms

Please provide examples of the way you deliver information to end users in general, and to users in the agricultural sector in particular (if relevant). Please provide links to webpages, or provide other supporting information, if possible. Expand the size of the response box, if needed (see Fiji example, for help):

How do you respond to direct enquiries about the climate	
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from the public (e.g. via an email or telephone service)?	
Do you have a general climate information webpage (and does it get regularly updated)? If yes, please provide the link.	
How do you provide information / warnings / alerts to the media (which media, e.g. radio, newspaper, TV?)	
Do you produce client reports for specific users? Is this a service for which they pay?	
Do you provide special data access to some (paying) customers? If yes, can you give an example?	
Do you give public talks related to the recent climate or on climate change? If yes, can you give examples of the title of the talk and the kind of audience?	
Do you have advisors who brief clients one-on-one on climate matters? If yes, what kind of clients are these?	
Do you have specific contracts with other ministries or departments? Which ones?	
Do you work directly with extension agents, such as farming advisors? If yes, do	

you have regular meetings, or is it more ad-hoc?	
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#### 4. Use of climate information

Can you provide any examples of the use of climate information you provide, in particular by agricultural sector users. Expand the size of the response box, if needed (see Fiji example, for help):

Who are the people most interested in your information (e.g. farmers, students, engineers, government agencies)?	
Examples of the use of climate information:	

#### 5. Usefulness of climate information

Can you provide any examples of feedback from users, particularly in the agricultural sector, where the provision of climate data, information and/or services has been useful to their operations and planning? Expand the size of the response box, if needed (see Fiji example, for help):

Examples of the usefulness of climate information:	
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#### 6. Gaps and needs

Are you aware of any gaps and needs in the provision of climate information and services for your country? Can you suggest ways to improve the use of climate information, in particular for agriculture? Expand the size of the response box, if needed (see Fiji example, for help):

What are the gaps and needs you have for providing climate services?	
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How could climate services (in particular for agriculture) be improved in your country?	

***Please send the completed questionnaire to Dr Tait at the following address not later than 30 June 2013***

Dr Andrew Tait  
National Climate Centre  
National Institute of Water and Atmospheric Research (NIWA)  
New Zealand  
E-mail: [andrew.tait@niwa.co.nz](mailto:andrew.tait@niwa.co.nz)

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# *Example (Fiji)*



# Current use of climate information and services for agriculture in RA V – Questionnaire

## 1. General Information

Please complete the following information (see Fiji example, for help):

Country name:	Fiji	
Respondent name:	Arieta Daphne	
Respondent organisation:	Fiji Meteorological Services	
Number of staff involved in providing climate services:	8	
Number of rain gauges / climate stations (total, and in agricultural areas):	Total: Rain gauges: 40 Climate Stations: 22	In agricultural areas: Agriculture Research: 9 FSC Mills: 4 FSC Rainfall Sectors: 39

## 2. Climate Information and Services

Please give examples of the kind of climate information and services currently provided generally, and to the agricultural sector in particular. Please provide links to webpages, or provide other supporting information, if possible. Expand the size of the response box, if needed (see Fiji example, for help):

What kind of access to climate data do you provide? Is data access free, or at a cost?	Data request and agreement forms are currently being provided to all clients and once all required information have been provided, data are supplied at no cost upon the approval of the Director of Meteorology. It must be first established that data that is provided by FMS meets the needs of the clients and is most relevant to the user needs. However, there may be certain clients who will have to pay for services should FMS get reformed in future.
What kind of data products (e.g. plots or maps showing current climate conditions, and/or the difference from normal) do you provide?	Data products are plotted on maps (rainfall plots) and also displayed on graphs and processed datasets as required by the clients. FMS uses mostly difference from normal and have plans to provide this information as visualised maps.  We use Excel Spreadsheet to produce graphs, and rainfall maps and tropical cyclone tracks using MapInfo software for our climate products. FMS also processes raw data into Information Sheets.
Please describe the seasonal climate outlook	At the moment, we are using the Seasonal Climate Outlook for Pacific Island Countries (SCOPIC) model to generate seasonal

<p>(including tropical cyclone outlook) material you provide, if any.</p>	<p>rainfall and temperature outlooks for the ongoing three months and the following three months. For instance, in March, we will be generating rainfall and temperature outlook for March to May and also for June to August. The SCOPIC model uses the SOI and SST as predictors of rainfall and temperature, using the different stations historical rainfall and temperature data. FMS also extensively uses other GPC products both dynamical and statistical outputs from global and regional climate models. The seasonal outlook can be viewed at:  <a href="http://www.met.gov.fj/aifs_prods/Outlook.pdf">http://www.met.gov.fj/aifs_prods/Outlook.pdf</a></p> <p>FMS has started to issue seasonal Tropical Cyclone outlook from 2010 for the Fiji RSMC area of responsibility (160E to 120W and Equator to 25S) and is prepared around late September to early October. This outlook is presented to tropical cyclone forecasters within FMS during the pre-Tropical Cyclone season briefing. This briefing takes place before the TC season starts in November. Analysis for TC outlook is carried out using the historical TC data, taking into consideration the current ENSO phase and other regional to global climatic pattern that may influence the tropical cyclone genesis in the RSMC area of responsibility. The outlook can be viewed at:  <a href="http://www.met.gov.fj/aifs_prods/RSMC_Nadi_2011_12_Tropical_Cyclone_Season_Outlook.pdf">http://www.met.gov.fj/aifs_prods/RSMC_Nadi_2011_12_Tropical_Cyclone_Season_Outlook.pdf</a></p>
<p>If you produce reports on the climate of the previous month or season, or on recent extreme events, please describe them.</p>	<p>FMS have been preparing climate reports on a monthly basis over the last three decades. The first report was prepared in 1980 and it was called "Weather Summary" where the weather conditions of the past month compared to previous years and normal was compared.</p> <p>Overtime this report has been re-named and currently as "Fiji Islands Climate Summary" that is released monthly, to solely describe the different climate and weather conditions experienced during the past month. Elements incorporated include; rainfall, temperatures (maximum, minimum &amp; mean), sunshine, radiation, wind, evaporation and satellite images and any extreme values.</p> <p>In case of an extreme event, such as hail storm, swells, tropical cyclone, heavy rainfall, dry spell or drought, an additional page is included in the bulletin to describe the event.</p> <p>The monthly climate summary can be viewed at:  <a href="http://www.met.gov.fj/aifs_prods/Summary.pdf">http://www.met.gov.fj/aifs_prods/Summary.pdf</a></p> <p>There is also an Annual Climate Summary prepared at the beginning of a new year, to summarise the different; weather patterns, rainfall, temperature pattern and any extreme or rare events for the previous year. This product can be viewed at:  <a href="http://www.met.gov.fj/aifs_prods/Summary2.pdf">http://www.met.gov.fj/aifs_prods/Summary2.pdf</a></p>
<p>What is the extent of information you have on the long-term climate patterns of your country, and on the effects of La Niña and El</p>	<p>The extent of information available for our staff to depict long term climate patterns comes from the knowledge of major climate drivers of the region and their annual and seasonal mean positions. The major drivers are the South Pacific Convergence Zone (SPCZ), Trade winds and sub-tropical Highs and on</p>

<p>Niño? Is the information available to the public?</p>	<p>occasions Monsoonal Troughs.</p> <p>These climatic features are influenced by the El Nino Southern Oscillation (ENSO) phenomena.</p> <p>Information on the current ENSO phase in the region, together with the Global Climate Model Predictions for the on-coming months on the likely status of the event, that is, information on different phases of ENSO provides a good guidance of relative position and associated expected climate anomalies over Fiji.</p> <p>Analogues on ENSO impacts (El Niño and La Niña) on the country are incorporated into the bulletins. Information is emailed to stakeholders and is also freely available on our website: <a href="http://www.met.gov.fj/Climate Data and Products">http://www.met.gov.fj/Climate Data and Products</a>.</p> <p>FMS provides an ENSO Update bi-monthly, which provides information on the current and its likely impacts on Fiji's rainfall and temperature. It also provides observations and rainfall patterns currently being experienced and the pattern expected. ENSO Update can be viewed at: <a href="http://www.met.gov.fj/aifs_prods/ENSO%20Update.pdf">http://www.met.gov.fj/aifs_prods/ENSO%20Update.pdf</a></p> <p>However, there is very little literature available on the impacts of El Niño and La Niña on Fiji. Progress is being made to overcome this.</p> <p>For more specific and technical information, clients are encouraged to contact FMS.</p>
<p>What kind of scheduled reports and/or advisories do you produce?</p>	<p>Scheduled Reports and Frequency of Publication (brackets)</p> <p>Climate Summary (Monthly)</p> <p>Seasonal Outlook (Monthly)</p> <p>Special Sector Outlook</p> <ul style="list-style-type: none"> <li>• Sugar Industry (Quarterly)</li> <li>• Renewable Energy (Monthly)</li> <li>• AgTrade (Quarterly)</li> </ul> <p>Enso Update (Bi- monthly)</p> <p>Annual Climate Summary (Annual)</p> <p>Seasonal Tropical Cyclone Outlook (Tropical Cyclone Season)</p> <p>FMS monitors meteorological drought in different parts of the country, and issues advisories on the prevailing situation and expected developments for specific sector needs and more so for the National Disaster Management Office.</p> <p>However, there is no systematic drought warning system in place for Fiji currently. A pilot study on early drought warning is being proposed at a catchment level.</p>
<p>What kind of watches and warnings or alerts do you issue, if any?</p>	<p>There is no systematic drought warning system in place for Fiji currently. A pilot study on early drought warning is being proposed at a catchment level.</p>
<p>Do you provide any of the above information directly to users in the agricultural</p>	<p>At the moment, we currently tailor make a special bulletin for the Fiji Sugar Industry. This information is used at different levels.</p>

<p>sector (perhaps as a special report or service)? Who are these users?</p>	<ul style="list-style-type: none"> <li>• At the milling level, the Fiji Sugar Corporation (FSC) uses this information to plan and decide when to start or end the milling;</li> <li>• At the marketing level, FSC can determine whether they can meet the required quota of sugar for the existing markets for the year;</li> <li>• If the season looks good and surplus sugar expected, then search for new market;</li> <li>• At the farming level, the information flows down to farmers through Sugar Cane Growers Council and the FSC field officers;</li> <li>• Farmers make decision when to plant and allocate resources;</li> <li>• Decisions are made on fertiliser application and weed control.</li> </ul> <p>This information within the industry is used in a variety of ways and above a few to mention. The product can be viewed at:  <a href="http://www.met.gov.fj/aifs_prods/SOutlook.pdf">http://www.met.gov.fj/aifs_prods/SOutlook.pdf</a></p> <p>FMS also contributes a page in the "Fiji AgTrade Bulletin" prepared by the Department of Agriculture. This information is widely used for Agricultural purpose. It can be viewed at:  <a href="http://www.agriculture.org.fj/resources/main/files/FijiAgTrade%20Volume%202,%202011.pdf">http://www.agriculture.org.fj/resources/main/files/FijiAgTrade%20Volume%202,%202011.pdf</a></p>
<p>Anything else (other climate services)?</p>	<p>Other climate service includes:</p> <ul style="list-style-type: none"> <li>• Monitoring and Prediction</li> <li>• Climate Change</li> <li>• Risk Management</li> </ul>

### 3. Delivery mechanisms

Please provide examples of the way you deliver information to end users in general, and to users in the agricultural sector in particular (if relevant). Please provide links to webpages, or provide other supporting information, if possible. Expand the size of the response box, if needed (see Fiji example, for help):

<p>How do you respond to direct enquiries about the climate from the public (e.g. via an email or telephone service)?</p>	<p>There are several modes of receiving the client requests into FMS. This includes by direct approach, telephone, fax and e-mail.</p> <p>On every enquiry, clients are asked to fill out two forms one of which is the 'Data and Product Request' and the other is the 'Product Agreement Form', which contains an agreement</p>
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	<p>between the organization and the client with regards to the usage of the data.</p> <p>The mode of delivery to the clients entirely depends on the clients. Most of them prefer to be sent by e-mail while others prefer to collect themselves.</p>
<p>Do you have a general climate information webpage (and does it get regularly updated)? If yes, please provide the link.</p>	<p>We do have the FMS web page, which is; <a href="http://www.met.gov.fj">http://www.met.gov.fj</a> and the climate products are loaded onto the 'Climate Data &amp; Products', which is a section on the web page. All recently released climate bulletins are loaded onto this site: <a href="http://www.met.gov.fj/climate_section.html">http://www.met.gov.fj/climate_section.html</a></p> <p>The products on the FMS website get regularly updated every month by 1<sup>st</sup> or 2<sup>nd</sup> week.</p>
<p>How do you provide information / warnings / alerts to the media (which media, e.g. radio, newspaper, TV?)</p>	<p>All interaction with media is handled by the Director of Meteorology. The Climate Services Division prepares information and the Director turns the contents into a media release.</p> <p>This goes to the print, voice and visual media groups. For further information, they get in touch with the Director.</p>
<p>Do you produce client reports for specific users? Is this a service for which they pay?</p>	<p>Upon request, FMS tailor makes specific information to suit the cliental needs.</p> <p>FMS do not have a charging policy at the moment and all information is provided at no cost.</p>
<p>Do you provide special data access to some (paying) customers? If yes, can you give an example?</p>	<p>No, this option is not available currently.</p> <p>However, in near future, clients will have options to subscribe to a set of products.</p>
<p>Do you give public talks related to the recent climate or on climate change? If yes, can you give examples of the title of the talk and the kind of audience?</p>	<p>Yes, public talks are part of our outreach programme. We make presentations to the public on various topics and one of the most common is the climate of Fiji and observed climate change in Fiji.</p> <p>We participate in number of workshops and meetings locally and asked to provide presentations on influence of climate, variability and change.</p> <p>Climate change science is one of the most popular topics that many organisation and national forums request FMS to talk on.</p> <p>Recently, a very interesting one was organised by the Wildlife Conservation (WWF) on Building Resilience on Climate Change, which involved the members of the local community and also representatives from some government departments. It involved representatives from the different districts and provinces to understand our changing climate.</p>

	<p>At the climate change country team level, FMS provided climate change science to be part of the Climate Change Policy.</p> <p>As a government agency, FMS has been mandated to provide information on climate and climate change science and plays an advisory role in this area.</p>
<p>Do you have advisors who brief clients one-on-one on climate matters? If yes, what kind of clients are these?</p>	<p>FMS provides consultative service and this depends on the type of information the client needs. We have clients who prefer to talk one-on-one regarding the various climate data, products and services and also enquire for specialised services.</p> <p>These clients come from various sectors such as agriculture, construction, tourism, planning and design, transport, education, government, land use, research, offshore industries to name a few.</p> <p>There is a high demand for climate data and hydro-meteorological extreme events information for climate change adaptation and disaster risk planning.</p> <p>Many of the clients need technical information and they come to FMS on regular basis and form a partnership to develop project proposals of common interest, etc.</p>
<p>Do you have specific contracts with other ministries or departments? Which ones?</p>	<p>We are yet to go into specific contracts with our clients, however, we do have memorandum of agreement or understanding with PCCSP and PI-CPP. We are now formulating MOU or MOA for government ministries and other stakeholders so that information could be exchanged more freely.</p> <p>At the moment FMS is working with a draft MOU with Ministry of Foreign Affairs and Ministry of Health.</p> <p>Not only this, FMS is also working on a Service Level Agreements for services required.</p>
<p>Do you work directly with extension agents, such as farming advisors? If yes, do you have regular meetings, or is it more ad-hoc?</p>	<p>No, FMS do not directly work with extension agents.</p> <p>FMS works with agencies and these agencies have their network of extension officers that take tailored and simplified information to the farmers.</p> <p>This is the platform used for the sugar industry and agriculture. Similar plan of action is suggested for the water managers for the efficient and effective management of water resources.</p>

#### 4. Use of climate information

Can you provide any examples of the use of climate information you provide, in particular by agricultural sector users. Expand the size of the response box, if needed (see Fiji example, for help):

<p>Who are the people most interested in your information (e.g. farmers, students, engineers, government agencies)?</p>	<p>We have a variety of users in our domain. These are mostly planners, engineers, construction companies, environment consultants, government agencies, education and research and so on.</p>
<p>Examples of the use of climate information:</p>	<p>In the agricultural sector, there have been several requests for adaptation planning for crop diversification such as potatoes and Mushroom farming.</p> <p>Sugar cane farmers use climate information to maximise their production, plan fertiliser application and do weed controlling. Also use when to plant and where to plant and what to plant.</p> <p>In the energy sector, the planners use climate information to make best use of water for the hydropower generation by maximising use of water and minimising use of fossil fuel.</p> <p>In the construction industry, the industry uses climate information to plan their work and work out delays and apply for extension of contracts.</p> <p>The above are few examples.</p>

## 5. Usefulness of climate information

Can you provide any examples of feedback from users, particularly in the agricultural sector, where the provision of climate data, information and/or services has been useful to their operations and planning? Expand the size of the response box, if needed (see Fiji example, for help):

<p>Examples of the usefulness of climate information:</p>	<p>The usefulness of the climate information cannot be over-emphasised.</p> <ul style="list-style-type: none"> <li>• Data is needed for research and to validate models</li> <li>• Research on new varieties of crops</li> <li>• Breeding of new varieties</li> <li>• Change livestock breed</li> <li>• Reduce sell/buy</li> <li>• Maximise profits and minimise loss</li> <li>• Make decisions based on expected climate</li> <li>• Planning of resources and workforce</li> <li>• Input management</li> </ul>
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	<ul style="list-style-type: none"> <li>• Change crop or change crop mix</li> <li>• Change planting dates</li> <li>• Marketing of agricultural products</li> </ul>
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## 6. Gaps and needs

Are you aware of any gaps and needs in the provision of climate information and services for your country? Can you suggest ways to improve the use of climate information, in particular for agriculture? Expand the size of the response box, if needed (see Fiji example, for help):

<p>What are the gaps and needs you have for providing climate services?</p>	<ul style="list-style-type: none"> <li>• Lack of skilled staff in agricultural sector who can downscale climate information to farming levels;</li> <li>• Inconsistencies in long term data to establish climatological averages, means and variances over time;</li> <li>• Lack of appropriate statistical and analytical tools for agricultural information development such as production of climatic maps, which could assist farmers in decision making;</li> <li>• Poor distribution of agro-meteorological sites and most of the sites are in coastal areas;</li> <li>• No agro-climate exists for the highlands and this makes difficult to establish any opportunities under changing climate;</li> <li>• Lack initiatives for agro-climate monitoring to provide agro-meteorological service;</li> <li>• Lack of feedback mechanism from agricultural sector as how seasonal forecasts are utilised in decision making;</li> <li>• Lack of systematic implementation of early climate warning for Agriculture;</li> <li>• Lack of knowledge and community awareness on the usefulness of climate information;</li> <li>• Validation of agro-met. Models to assist the scientific and research for current and future changes in agro-climatology.</li> </ul>
<p>How could climate services (in particular for agriculture) be improved in your country?</p>	<p>Climate services could be improved if the above gaps identified are addressed.</p>



