World Meteorological Organization
Weather • Climate • Water

CLIMATE INFORMATION FOR FOOD SECURITY

UN SYSTEM
DELIVERING AS ONE ON
CLIMATE KNOWLEDGE

Year-to-year climate variability has a large influence on agriculture, which is heavily dependent on rainfall, sunshine and temperature. Human induced climate change has introduced a new complicating factor into the food security equation which is changing this climate variability. At higher latitudes some producers may benefit from a longer growing season. But arid and semi-arid areas will experience increased water stress. There is expected to be an increase in the frequency and intensity of extreme events such as floods and droughts, which will have an impact on crops and livestock.

Better understanding and management of climate variability will help us cope with climate change. Decreasing the vulnerability of different sectors such as biodiversity, forestry, and agriculture to natural climate variability through a more informed choice of policies, practices and technologies will, in many cases, reduce the long-term vulnerability of these systems to climate change.

The agricultural sector needs accurate, reliable and timely weather and climate information for daily tactical decisions and long-term planning. Seasonal climate outlooks are increasingly important tools for decisions such as what crops to plant and when to plant them and whether to sell livestock in the event of a looming drought. On a longer-term basis historical climate records, agricultural data and future climate scenarios will be needed for big decisions such as the purchase of land, the design of irrigation schemes and dams, the switch to more drought-resistant seeds or crops, or the introduction of systems to prevent or mitigate salt water intrusions.

The Global Framework for Climate Services aims to help bridge the gap and to foster the development of tools to effectively provide reliable predictions for time scales ranging from months to seasons, decades and longer time scales that will improve preparedness and critically extend the lead-time for preventive measures.

Impacts of drought on livestock

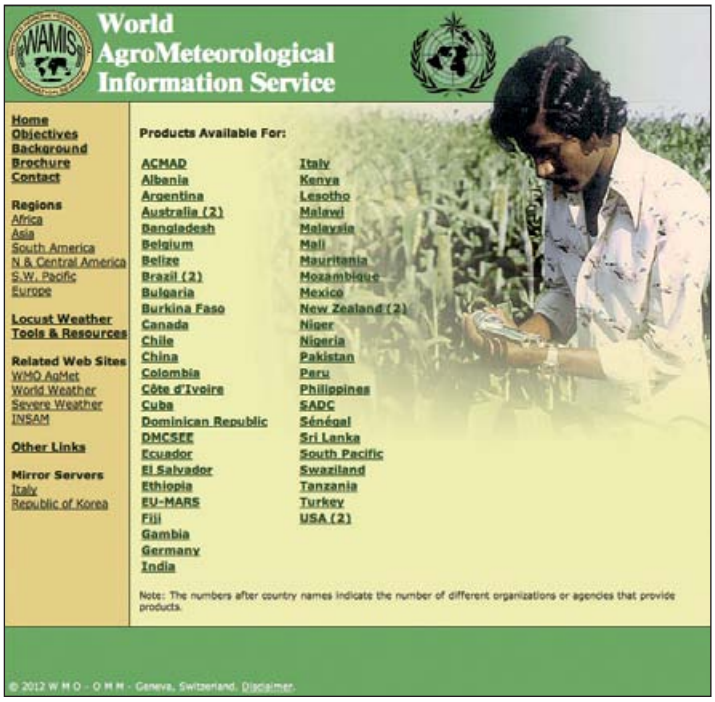
Providing global interaction: World AgroMeteorological Information System (WAMIS)

Scientific knowledge must be disseminated in a form that is meaningful and usable to the appropriate decision-makers. A key factor is that the service is driven by the needs of the user community, tailored to local needs, and resources based on collaboration and consultations with partners and stakeholders. Extension services often provide the information and knowledge "bridge" between the scientific community and the agricultural users. The quality and relevance of the information and technical advice provided to the farmers is vital.

Farmers need to be actively supported in their crop and yield relevant decisions

The World AgroMeteorological Information Service (WAMIS - www.wamis.org) is a dedicated computing platform that provides access to a library of resources to support an agro-weather management and decision-support system. This system delivers real-time advisory products and information to farmers and extension services by way of Information Communication Technology (ICT) as well as resources and services to National Meteorological and Hydrological Services (NMHSs) and policy makers.

Deliverables include specific planting or daily farm decisions, based on weather and climate data; or long-term planning based on seasonal outlooks and climate forecasts. Results can be used for policy recommendations on crop yield projections. Results can alter crop production risk and crop yield risk, based on pesticide applications and planting decisions. WAMIS plays a key role in strengthening this linkage with the extension services. Workshops and seminars are held periodically between providers of weather and climate information and with the stakeholders, to ensure that user needs are met. WAMIS hosts online training resources for these workshops.



World AgroMeteorological Information Service (WAMIS)

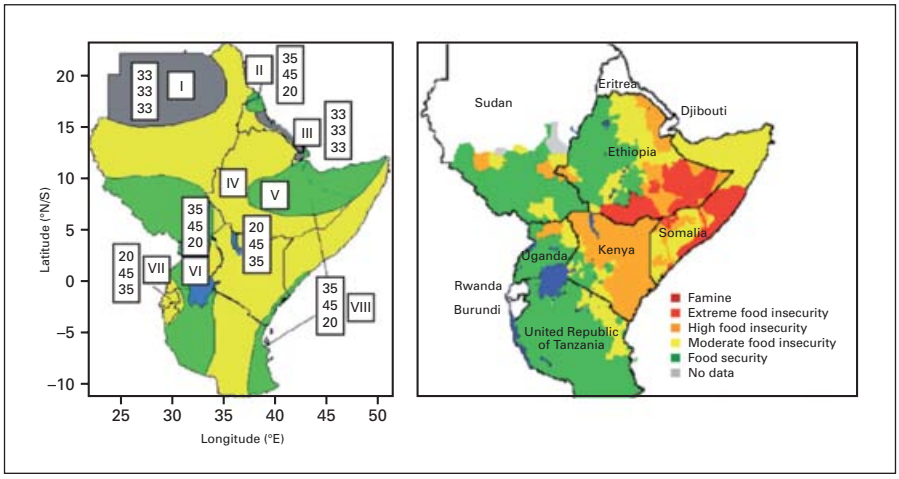
Seasonal climate forecasts for agricultural decision making

One of the most important decisions a farmer can make is deciding what crops to plant and when to plant them. In most areas of the world this is based on the start of the rainy season. However, how can climate experts know what the rainfall for the next season will be? Also, how is it ensured that the seasonal climate forecasts will be consistent across various countries?

Herders are strongly affected by drought

In the late 1990s, an innovative process known as the Regional Climate Outlook Forum (RCOF) was initiated by the World Meteorological Organization (WMO), National Meteorological and Hydrological Services (NMHSs) and other partners. These forums bring together climate experts to produce regional climate outlooks based on input from NMHSs, regional institutions and global producers of climate predictions. Consistency in access to, and interpretation of, climate information is ensured in countries with common climatological characteristics – for instance the South Asian monsoon - to clients in various sectors such as agriculture and food security, water resources, energy production and distribution, public health, disaster risk reduction and response, and outreach and communication. In many regions, the users benefiting from RCOFs contribute to the organization of the sessions, thus ensuring they are sustainable and meet user needs. This information has been applied to reducing climate-related risks and supporting sustainable development. The Global Framework for Climate Services (GFCS) will ensure that these RCOFs are given the necessary resources to function and build the capacity of individual countries to make optimal use of the seasonal climate outlooks to maximize socio-economic benefits.

Regional agriculture and food security outlooks are now produced regularly in some regions, based on the climate outlooks. For example, the left map below shows the climate outlook in the Greater Horn of Africa in the form of precipitation for March to May 2008. Based on this, the right map shows the Food Security Outlook for March to July 2008 prepared by the Famine Early Warning Systems Network which can now allow making provisions for the areas of increased risk.



RCOF products can assist in analyzing food security risks.

Teaching farmers how to interpret climate signals – Roving Seminars

Even if the climate information is accurate, reliable and timely, it is still not useful if the agricultural decision maker – a rural farmer, agricultural extension worker, or Minister of Agriculture – does not know how to interpret or understand the climate information. Therefore, communication and dissemination is also very important for producers of climate information.

Roving Seminar with the NMHS and farmers in Mali

Over the years, based on the experience of several African countries, WMO has encouraged NMHSs to organize Roving Seminars on Weather and Climate for Farmers. The Roving Seminars help raise the awareness of the farming community of the current advances in weather and climate information that can assist operational farming decisions. Also, feedback obtained from the farmers will help the personnel from the Meteorological Services and the Agricultural Extension Agencies to design more improved products for use by farmers and to improve the channels of communication to provide information to the farmers.

In Mali, the Roving Seminars are used to distribute simple rainguages to farmers and teach them how to measure rainfall. The National Meteorological Service has developed a system of agrometeorological assistance to farmers that uses historical climate in a simple way to develop crop planting advice. By measuring the rainfall and following the crop advice, farmers can increase their yields and incomes. For example, if the farmer measures 25 mm over 10 days by 15 June, the recommendation is to plant a long-season variety of the crop. If the farmer only measures 10 mm of rain over 10 days by 15 June, the recommendation is to plant a short-season variety of the crop. Current projects are underway to develop this kind of assistance to other countries in West Africa, and the GFCS will greatly aid this effort by making sure that the historical climate is complete and robust enough to be used in the crop model to develop the cropping advice.

Crop	Development zone	Field type	Area (ha)	Average yield (kg/ha)	Gross income (US$/ha)	Income gain in agromet fields (%)
Pearl millet	OHVN	Agromet	2,600	1,204	175	26
		Non-agromet	67,168	957	139	
	DRAMR	Agromet	750	757	110	10
		Non-agromet	45,790	690	100	
	ORS	Agromet	10,400	1,247	181	48
		Non-agromet	461,915	840	122	
Sorghum	OHVN	Agromet	5,375	1,427	193	42
		Non-agromet	470,996	1,005	136	
	DRAMR	Agromet	28,275	955	129	10
		Non-agromet	222,662	871	118	
	ORS	Agromet	2,850	1,562	212	56
		Non-agromet	179,853	1,002	136	
Maize	OHVN	Agromet	6,075	1,984	249	80
		Non-agromet	27,079	1,105	139	
Groundnut	DRAMR	Agromet	6,060	874	237	25
		Non-agromet	102,113	702	190	

Increase in yield after having learned how to measure rain and to interpret its impact on yield

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