Climate Services and Agriculture

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World Meteorological Organization

- United Nations agency for weather, climate, hydrology and water resources and related environmental issues.

- 189 Members from National Meteorological and Hydrological Services (NMHS)

- 10 major scientific & technical programmes (Secretariat)
- 8 Technical Commissions advise & guide activities of programmes (Experts)
- 6 Regional Associations involved in implementation

Five priority Areas

- Global Framework for Climate Services;
- Aviation meteorological services;
- Capacity-building for the developing and least developed countries;
- Implementation of the WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS);
- Disaster risk reduction

WMO Technical Commissions

- Commission for Aeronautical Meteorology (CAeM)
- Commission for Agricultural Meteorology (CAgM)
- Commission for Atmospheric Sciences (CAS)
- Commission for Basic Systems (CBS)
- Commission for Climatology (CCl)
- Commission for Hydrology (CHy)
- Commission for Instruments and Methods of Observation (CIMO)
- Joint WMO-IOC Commission for Oceanography and Marine Meteorology (JCOMM)

Food Security

Recent Increases in Food Prices


FAO Food Price Index
2002-2004=100
250
220
190
160
130
2011
2010
2008
2012
2009
J F M A M J J A S O N D

Cereal production,utilization and stocks

Four Aspects of Food Security (FAO)

- **Food Availability:** Sufficient quantities of quality food supplied through domestic production, imports, food aid
- **Food Access:** Access by individuals to adequate resources for obtaining food for a nutritious diet
- **Utilization:** Through adequate diet, clean water, sanitation, health care for nutritional well-being. Importance of non-food inputs in food security
- **Stability:** Population, household, individuals must have access to adequate food at all times. No risk of losing access to sudden shocks (economic or climatic crisis) Refers to both availability and access

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Use of Weather and Climate Information

Global Framework on Climate Services (GFCS)

Global Framework for Climate Services

- Goal:
  - Enable better management of the risks of climate variability and change and adaptation to climate change at all levels, through development and incorporation of science-based climate information and prediction into planning, policy and practice.

World Meteorological Organization
Weather • Climate • Water

WORLD CLIMATE CONFERENCE - 3

Geneva, Switzerland

31 August–4 September 2009

Why a Framework for Climate Services?

- **Present capabilities for providing climate services do not exploit all that we know about climate**

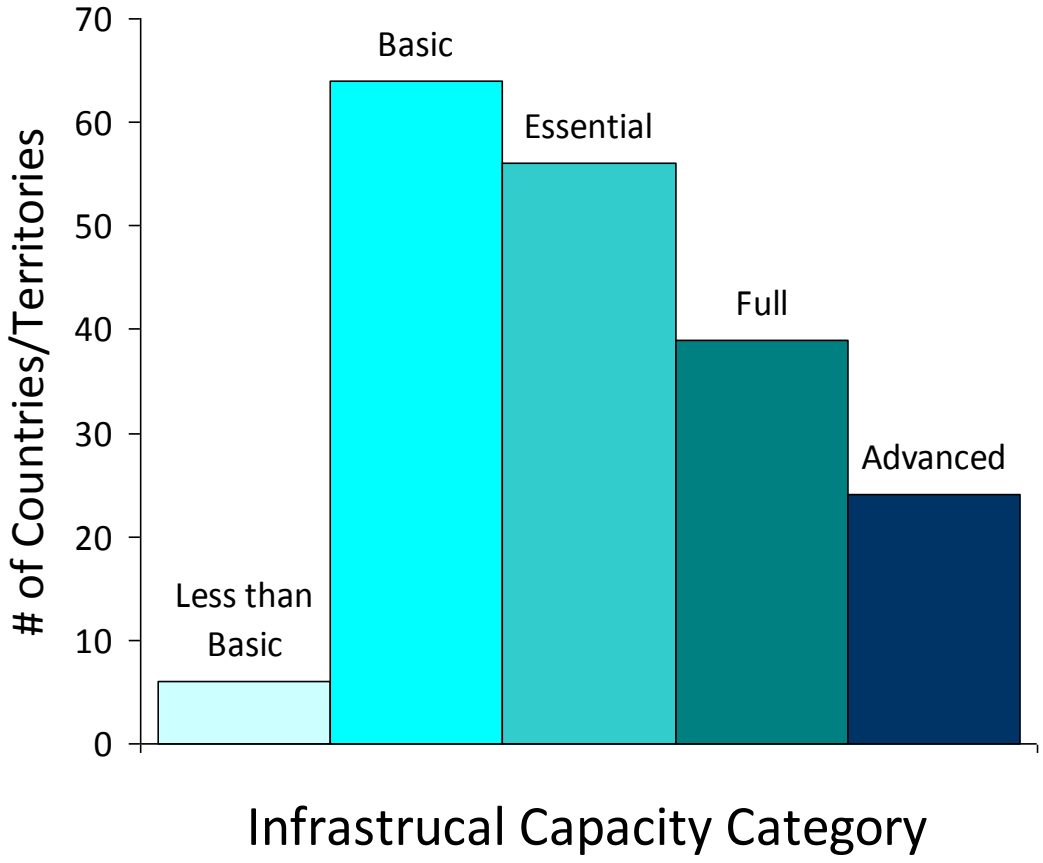
- **Present capabilities fall far short of meeting current and future needs and delivering their full and potential benefits, especially in developing countries**

A Framework for Climate Services will build on existing capacities and leverage these through coordination to address these shortcomings

Why a Framework for Climate Services?

- **Many countries lack the infrastructural, technical, human and institutional capacities to provide high-quality climate services.**

Infrastructural Capacities of Countries as of Aug 2010 to provide Basic, Essential, Full and Advanced Climate Services.



Why a Framework for Climate Services?

- **Climate services do not get the last mile to those who need them the most.**

Priorities

- Agriculture
- Disaster risk reduction
- Water
- Health



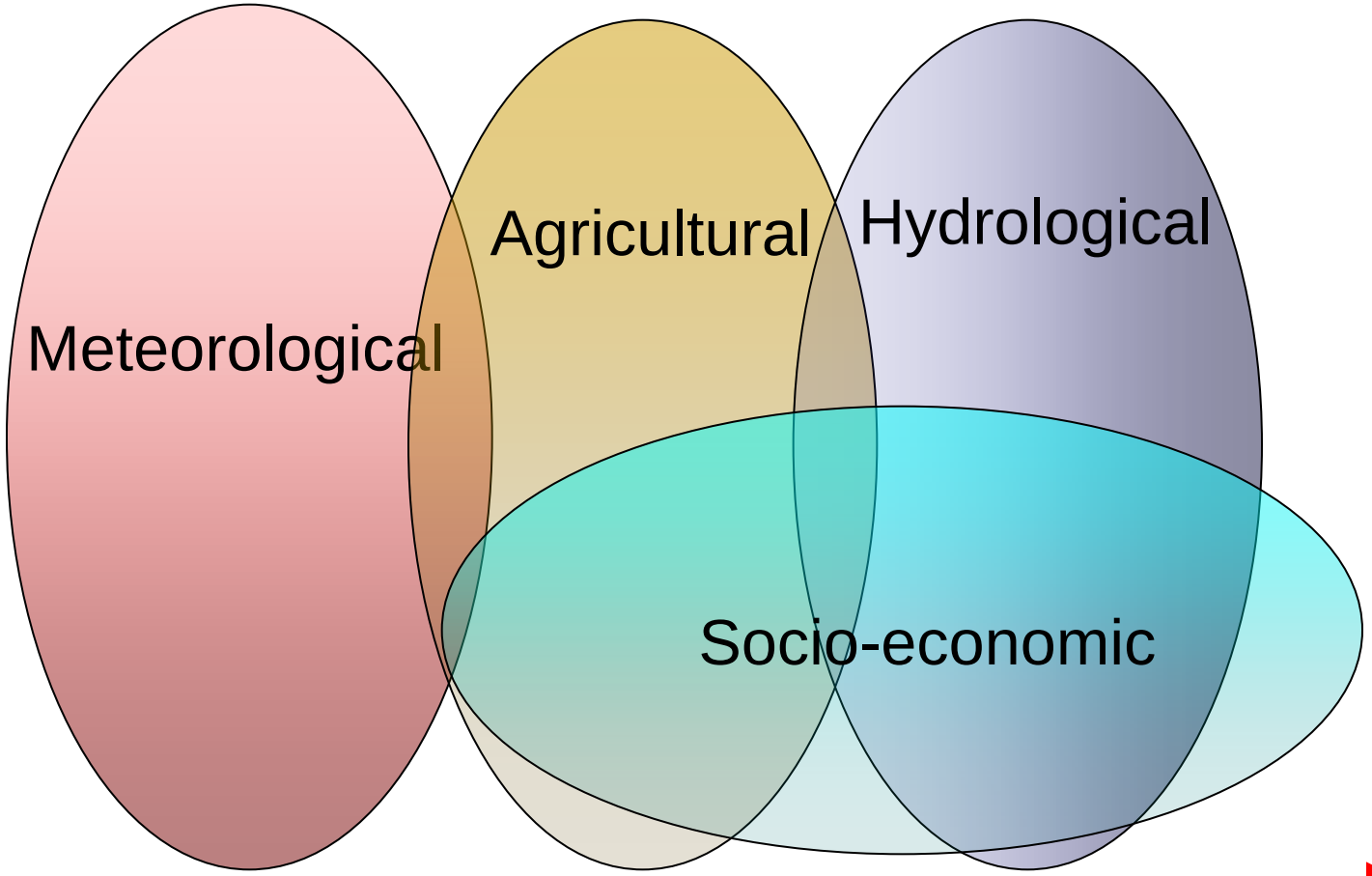



Natural and Social Dimensions of Drought

Decreasing emphasis on the natural event (precipitation deficiencies)

Increasing emphasis on water/natural resource management

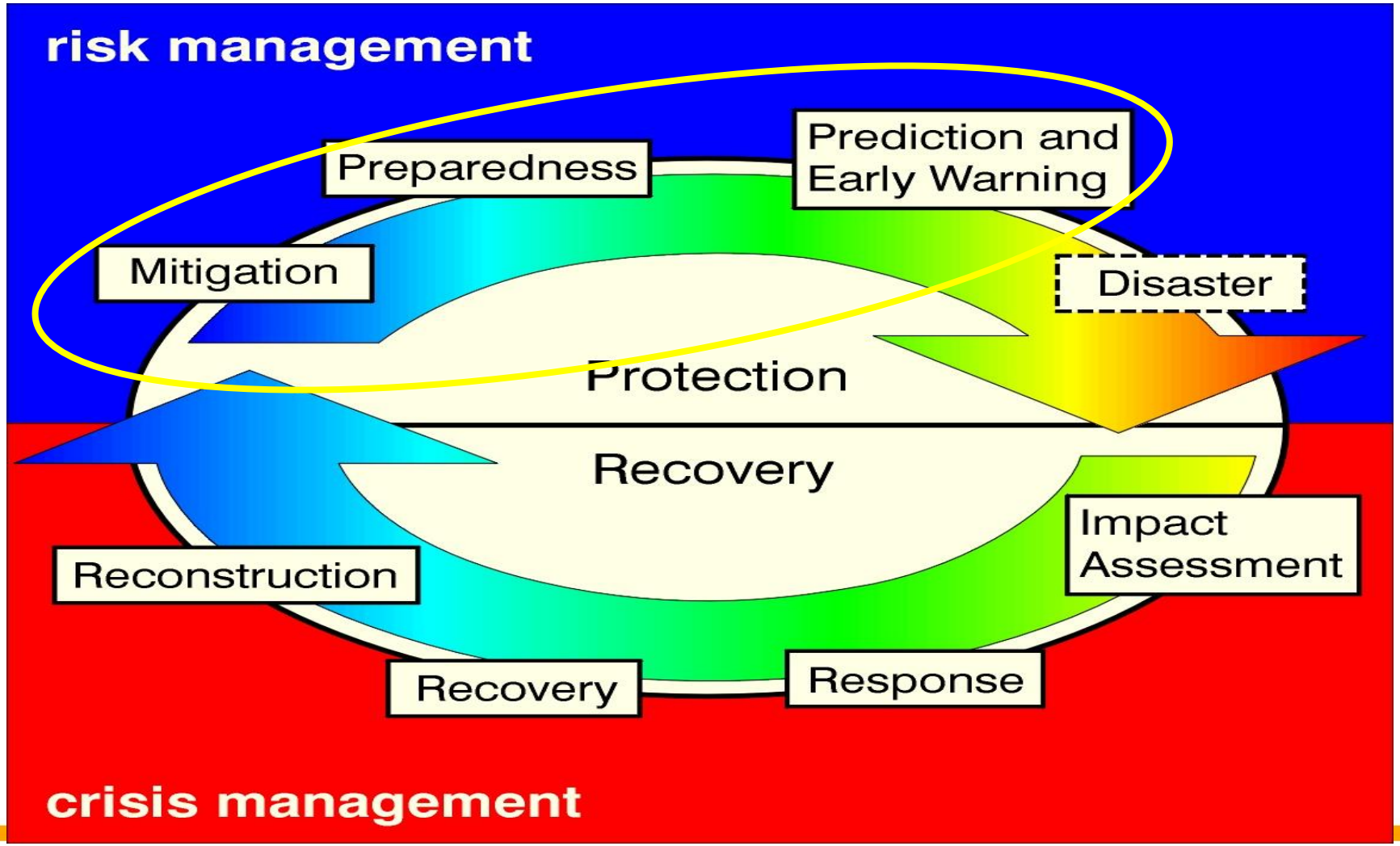
Increasing complexity of impacts and conflicts



Time/Duration of the event

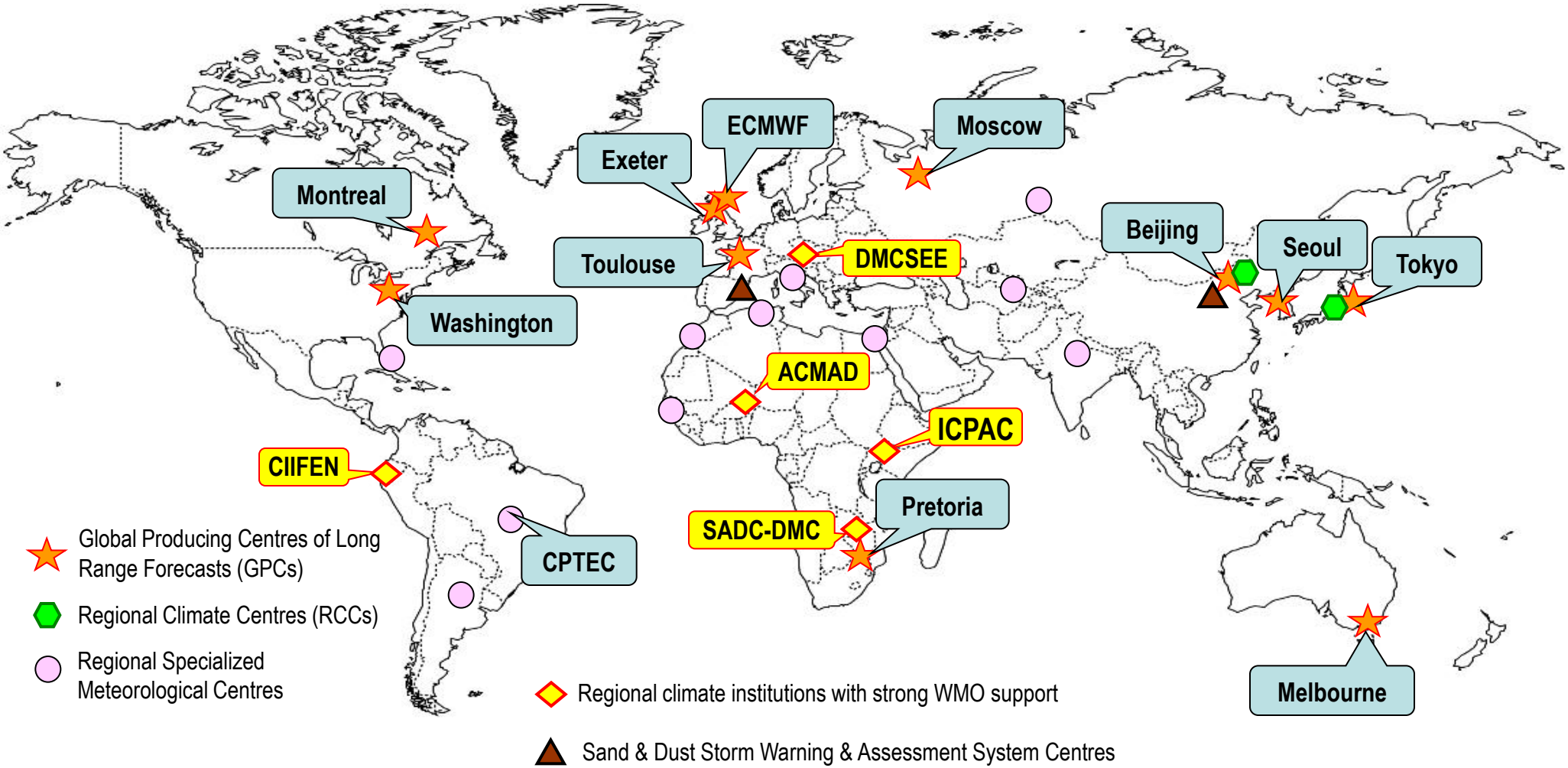
Source: Wilhite 2006

The Cycle of Disaster Management

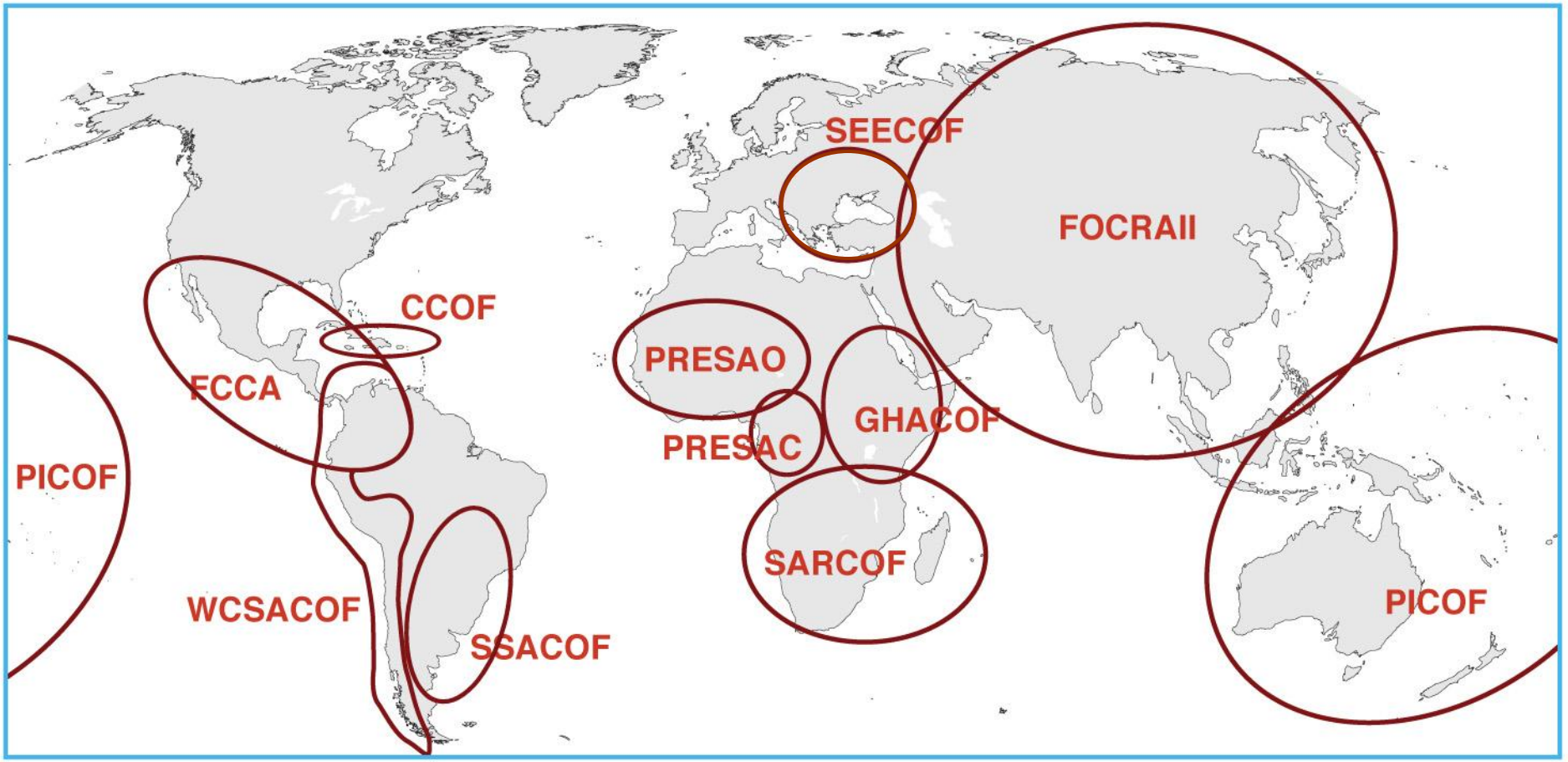


Source: Wilhite 2006

WMO network of institutions



Regional Climate Outlook Forums (RCOFs)



http://www.wmo.int/pages/prog/wcp/wcasp/clips/outlooks/climate_forecasts.html

GHACOF Products & Applications

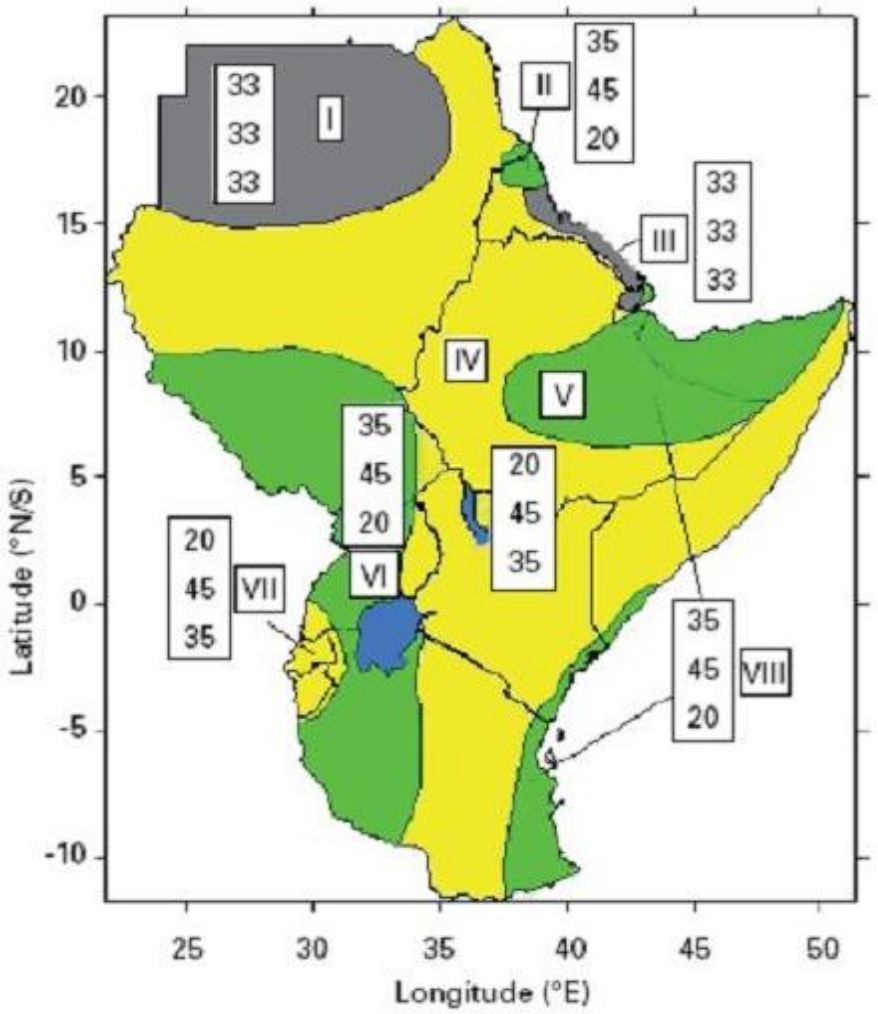


Figure 2(a) — Greater Horn of Africa Consensus Climate Outlook for March to May 2008 by ICPAC and partners including WMO and IRI.

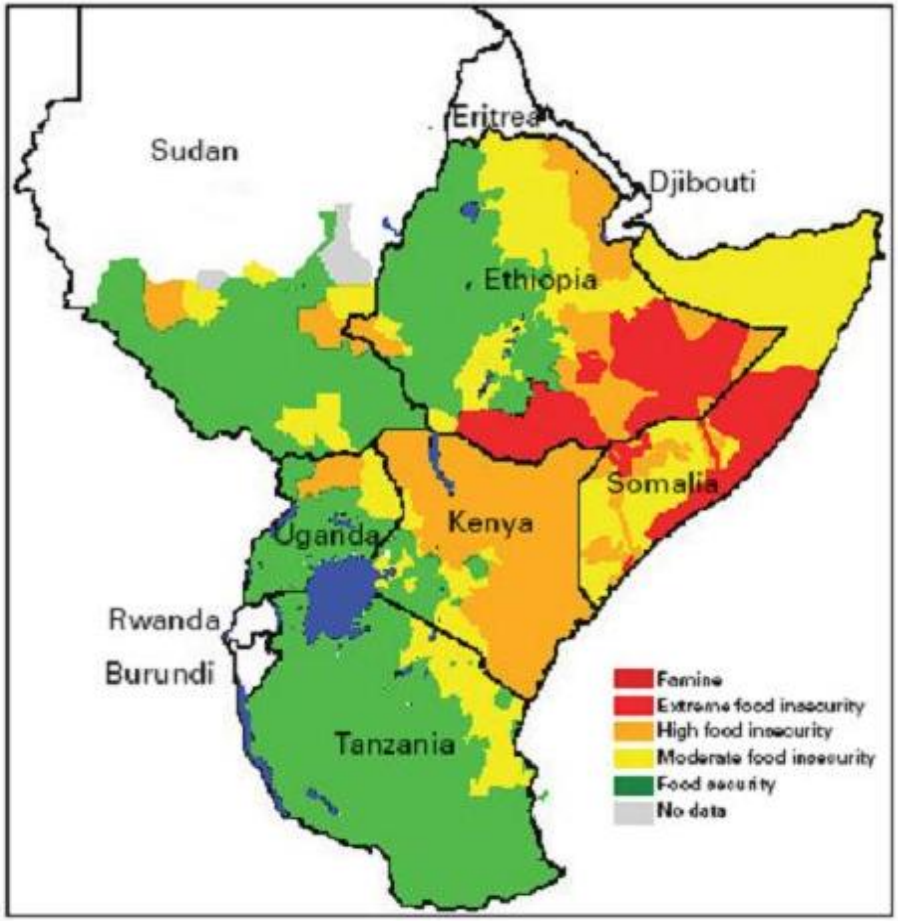


Figure 2(b) — Food Security Outlook for March to July 2008 by Famine Early Warning Systems Network (FEWSNET)

High-Level Meeting on National Drought Policies (HMNDP)

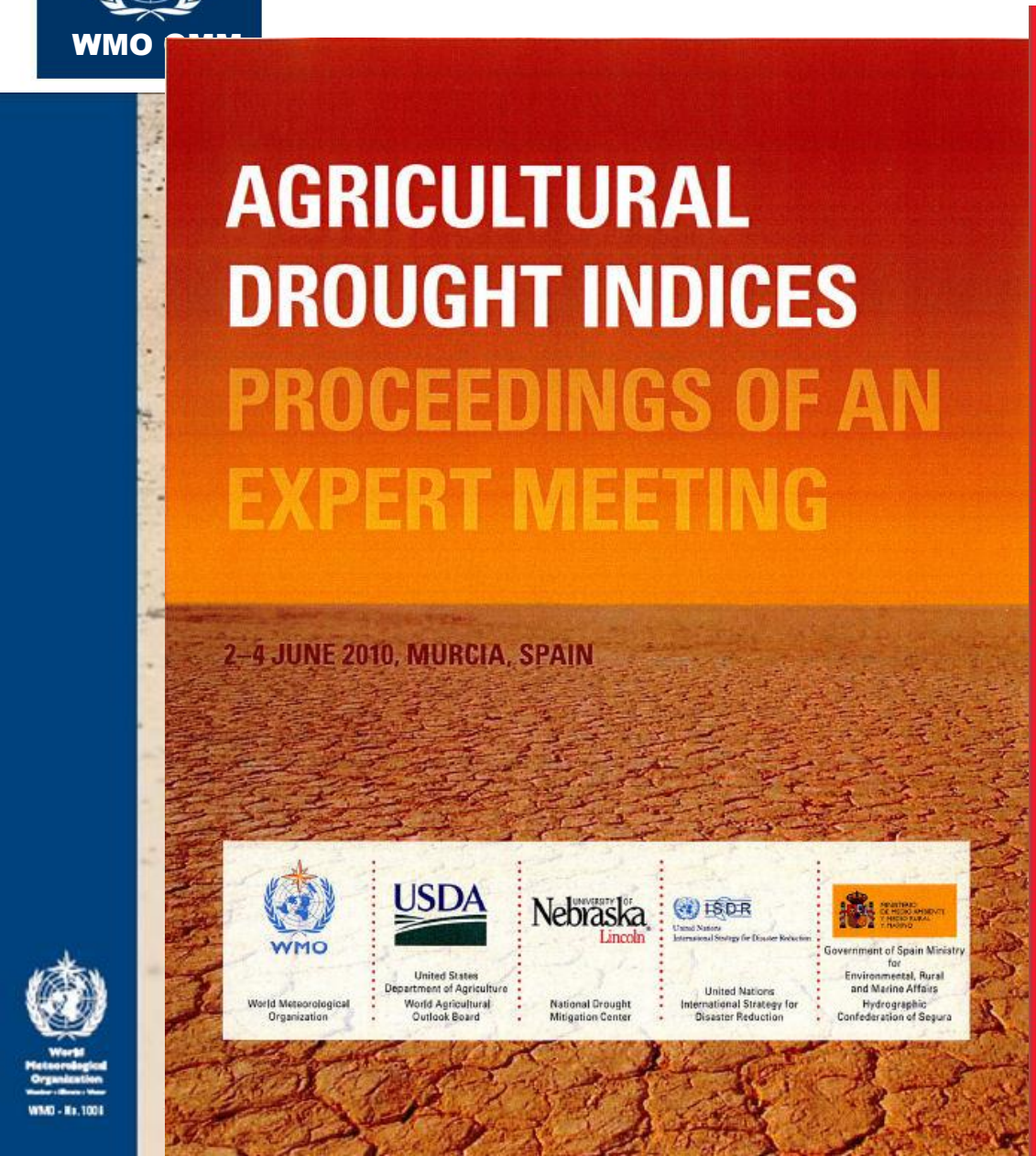
11-13 March 2013

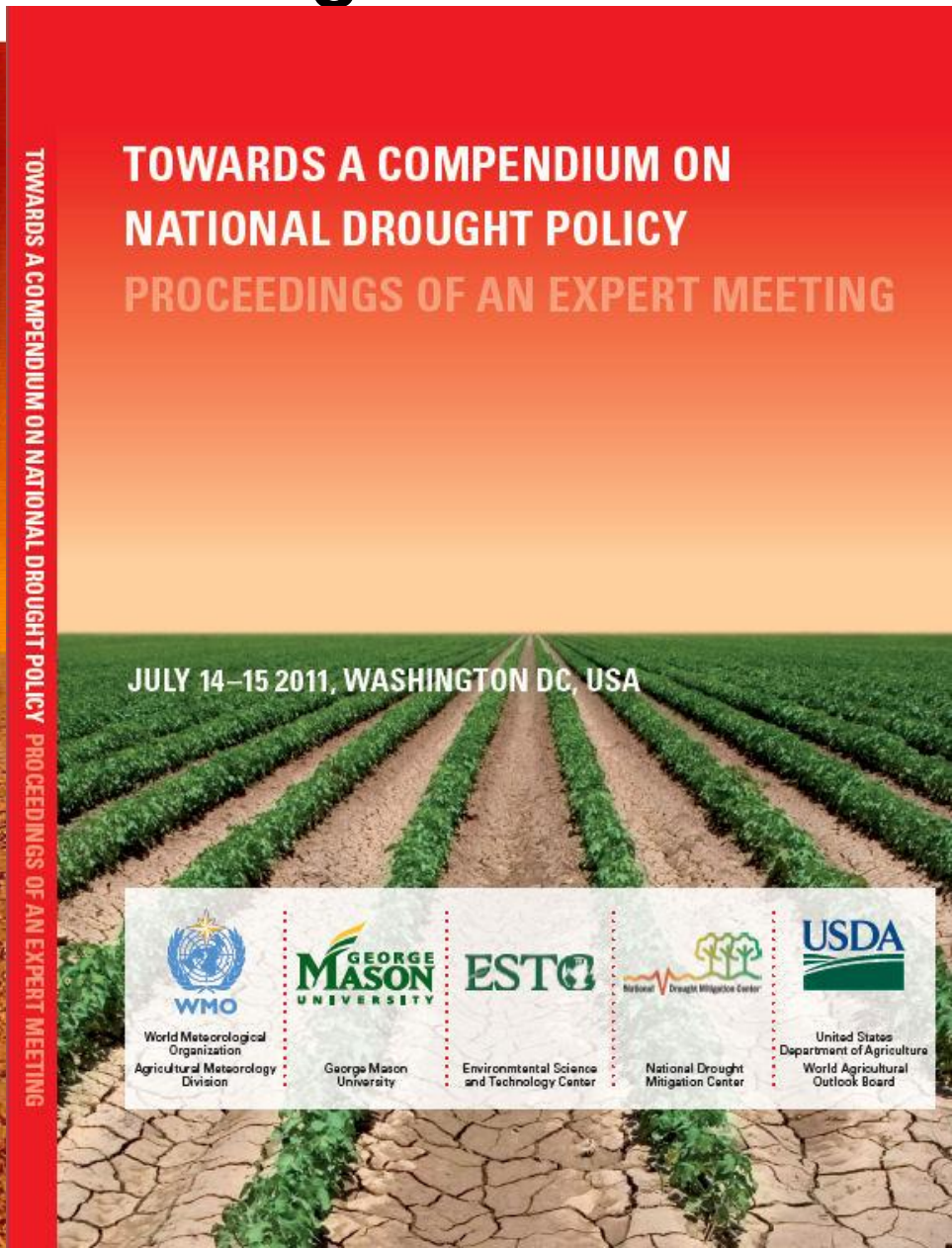
Why a HMNDP is needed ?

- A high level meeting could help develop approaches through
  - developing a common understanding of the issues involved,
  - discussing the different approaches that could be incorporated into a national drought policy and
  - finally establishing a framework of a national drought policy that could help all the nations around the world.

www.wmo.int/hmndp

WMO Publications on Drought





Integrated Drought Management Programme (IDMP)

Integrated Drought Management Programme

- **The expected services to be provided are:**
  - **Regional coordination**
  - **Pilot projects**
  - **Collection and dissemination of information**
  - **Guidelines, methodologies, tools**
  - **Capacity building**

Current Actions - IDMP

- Draft Concept Note has been developed and is currently being sent to donors.
- Ad-hoc Steering Committee will be established Fall 2012.
- IDMP webpage: www.wmo.int/idmp
- The IDMP concept being promoted at various meetings
- IDMP will integrate and incorporate WMO efforts on drought indices and High-Level Meeting on National Drought Polices (HMNDP)

Role of Weather and Climate Information to Agriculture

Agrometeorology

Users of Agrometeorological Information

Any agricultural decision-maker:

- International officials (i.e. Red Cross, WFP, UN)
- Government official
- Extension agent
- Farmers, ranchers, foresters, fishers
- Media
- General public

Key Questions in AgroMeteorology

- What are the weather / climate events that impact agricultural decision-making?

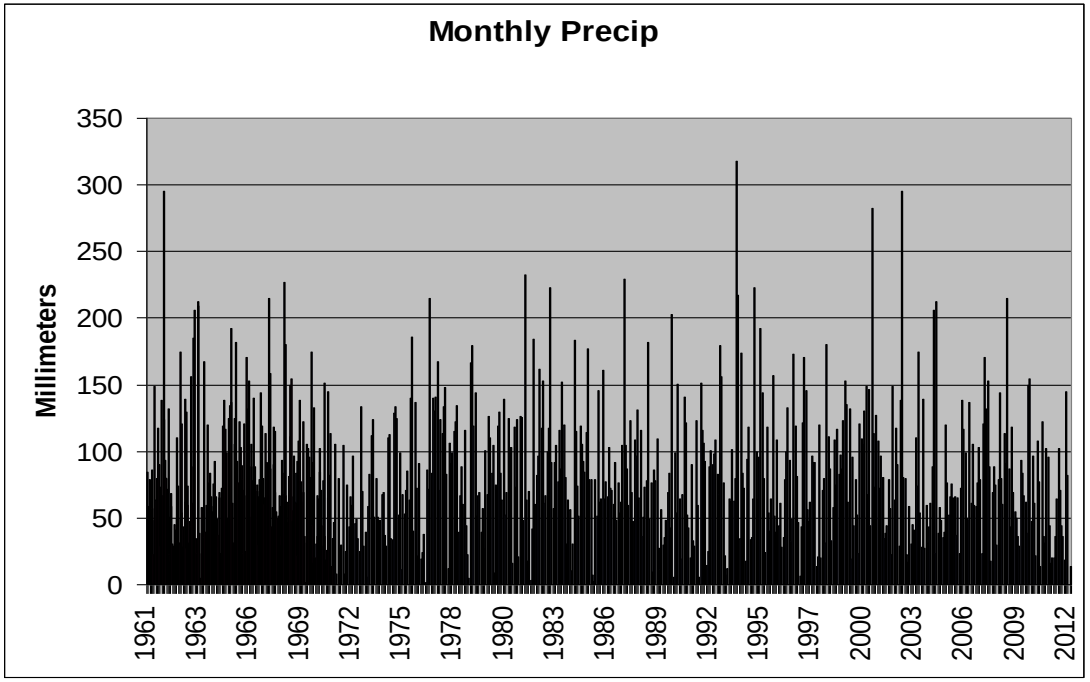
- How to relate weather / climate information to meaningful agricultural actions / practices?

Economic impact using 3-7 Day Weather Forecasts in India

Crop	Station name	% change in cost of Prod. (per acre)	% change in crop yield (per acre)	% change in profit (per acre)
Cotton	Hissar	1	14	10
	Coimbatore	-4	16	16
Rice	Ludhiana	-6	9	18
	Kalyani	-3	21	29
Wheat	Ludhiana	-6	9	17
Mustard	Hissar	-3	8	13

Climate Services and Agrometeorology

- Need Historical Climate Data
- Quality controlled



	A	B	C	D	E	F	G
1		Year	Month	Temp	Diff	Precip	Diff
2		1864	1	-4.2	-5.0	13.6	-68.4
3		1864	2	-0.7	-3.0	17.2	-63.8
4		1864	3	5.3	0.2	32.7	-46.3
5		1864	4	8.3	-0.5	35.2	-29.8
6		1864	5	13.5	0.5	68.9	-8.1
7		1864	6	15.6	-0.9	115.2	26.2
8		1864	7	19.3	0.2	37.7	-29.3
9		1864	8	17.4	-0.8	87.8	8.8
10		1864	9	13.5	-1.4	84.8	3.8
11		1864	10	8.1	-2.0	69.9	-7.1
12		1864	11	3.7	-1.3	104	12.0
13		1864	12	-1.5	-3.3	4.5	-82.5
14		1865	1	2	1.2	49.4	-32.6
15		1865	2	-0.4	-2.7	56.6	-24.4
16		1865	3	0.5	-4.6	30.6	-48.4
17		1865	4	12.4	3.6	18.3	-46.7
18		1865	5	15.7	2.7	81.7	4.7
19		1865	6	17.8	1.3	75.9	-13.1
20		1865	7	19.8	0.7	52	-15.0
21		1865	8	17.2	-1.0	138.4	59.4
22		1865	9	16.2	1.3	3.2	-77.8
23		1865	10	10.3	0.2	156.9	79.9
24		1865	11	5.7	0.7	70.3	-21.7
25		1865	12	-0.2	-2.0	35.1	-51.9
26		1866	1	2.9	2.1	50	-32.0
27		1866	2	5.2	2.9	93.8	12.8
28		1866	3	4.3	-0.8	169	90.0
29		1866	4	9.6	0.8	75.7	10.7
30		1866	5	11.2	-1.8	144.1	67.1
31		1866	6	18	1.5	46.5	-42.5
32		1866	7	18.4	-0.7	101.3	34.3
33		1866	8	16.1	-2.1	92.6	13.6
34		1866	9	15.3	0.4	120.7	39.7

Climate Services and Agrometeorology

- Historical Climate Data
- Crop Information
- Basic Soil Information

Simple Crop Model

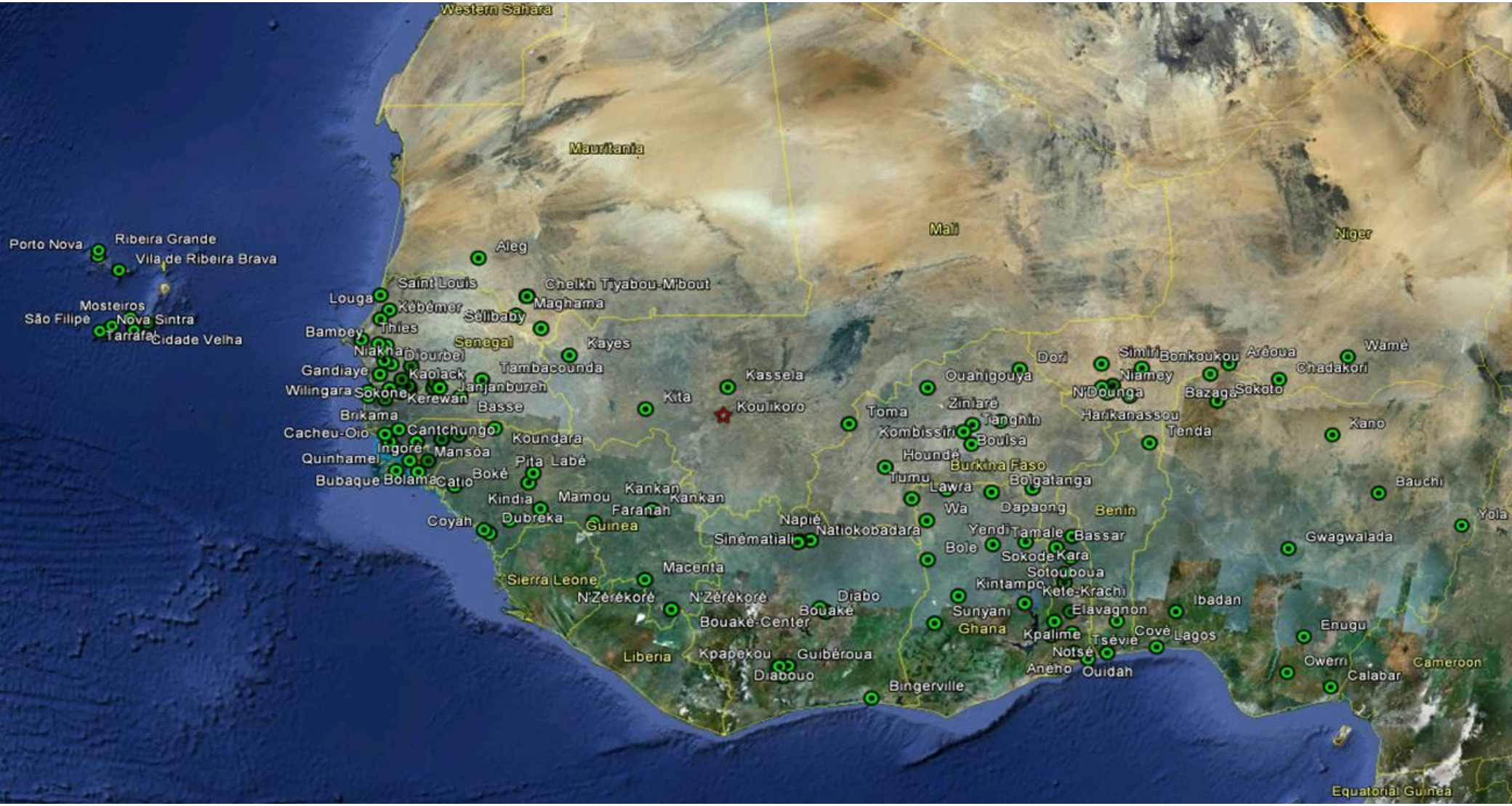
Crop Advice for Rural Farmers

2009 Seminar - Mali Met Service Presentation

2009 Seminar – Farmers ask Questions

Distribution of Rainguages to Nigerian Farmers

Roving Seminars in Western Africa: Georeference – 159 Seminars 2009-12



Thank You

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www.wmo.int/agm