Seasonal Climate Forecast Outlooks and Agriculture

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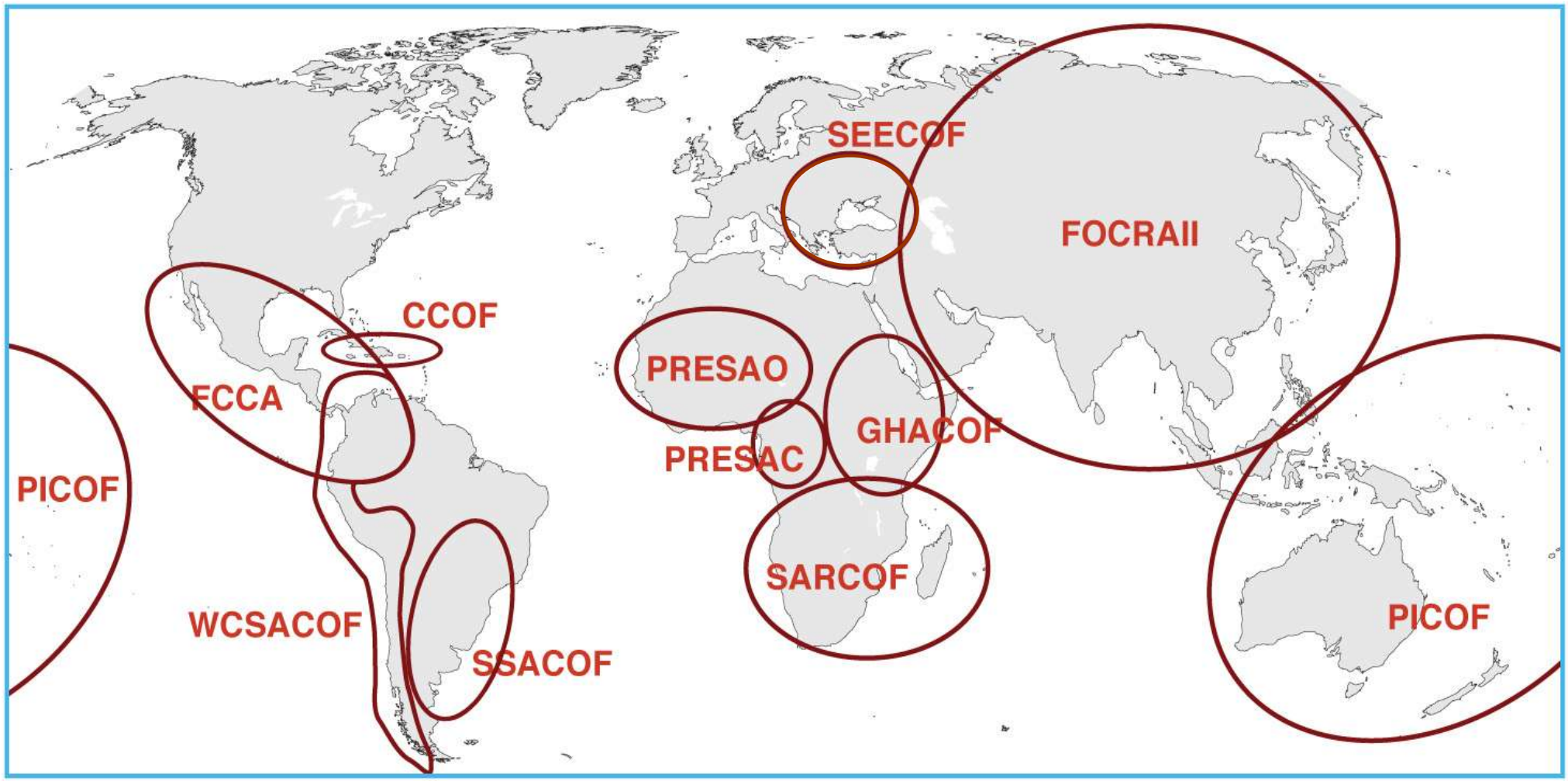
Regional Climate Outlook Forums (RCOFs)

- First established in 1996 at a Meeting in Victoria Falls, Zimbabwe.
- Gained momentum as a regional response to the major 1997–1998 El Niño event.
- RCOF Concept was pioneered in Africa and spread worldwide.
- WMO and a number of national, regional and international organizations (e.g., NOAA, IRI, Meteo France, World Bank, etc.) have supported their growth and expansion.

Existing RCOFs worldwide



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

RCOF Concept

- **Climate information including predictions/outlooks substantial benefit in adapting to and mitigating the impacts of climate variability and change.**
- **RCOFs have the responsibility to produce and disseminate a regional assessment (using a consensus-based approach) of regional climate for the upcoming season.**
- **Built into the RCOF process is a regional networking of the climate service providers and user-sector representatives.**

GHACOF Products & Applications

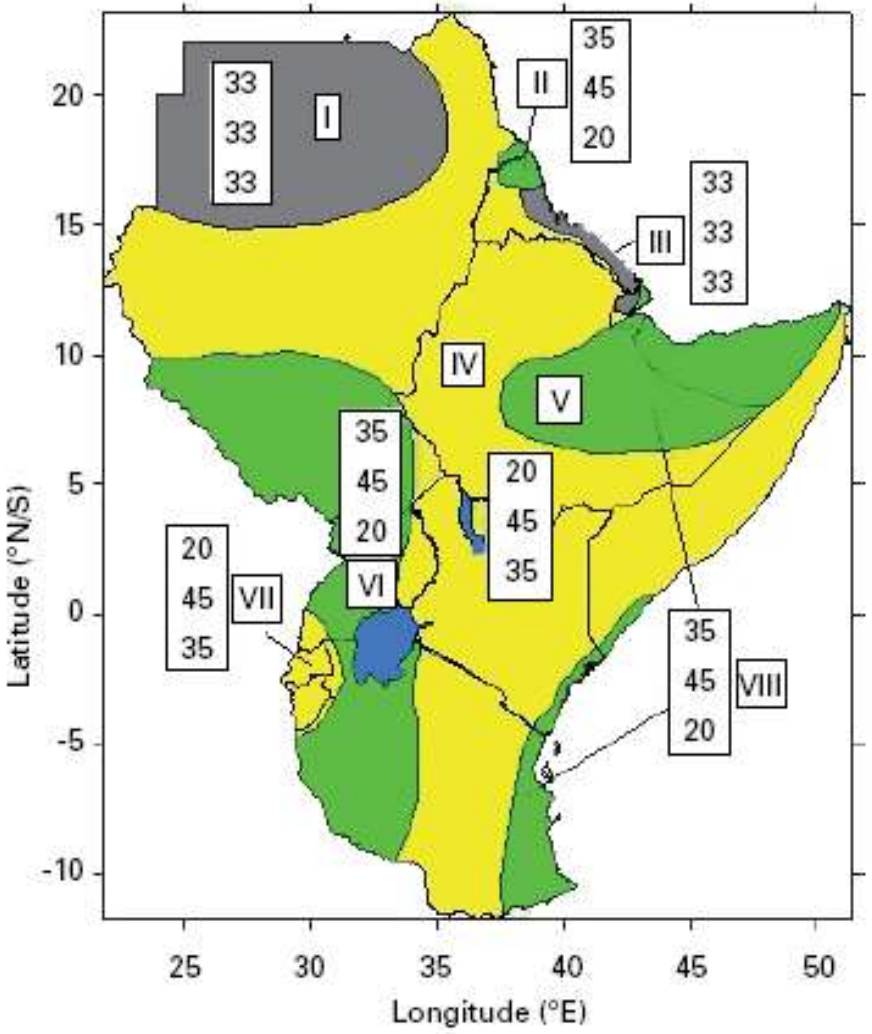


Figure 2(a) — Greater Horn of Africa Consensus Climate Outlook for March to May 2008 by ICPAC and partners including WMO and IRI.

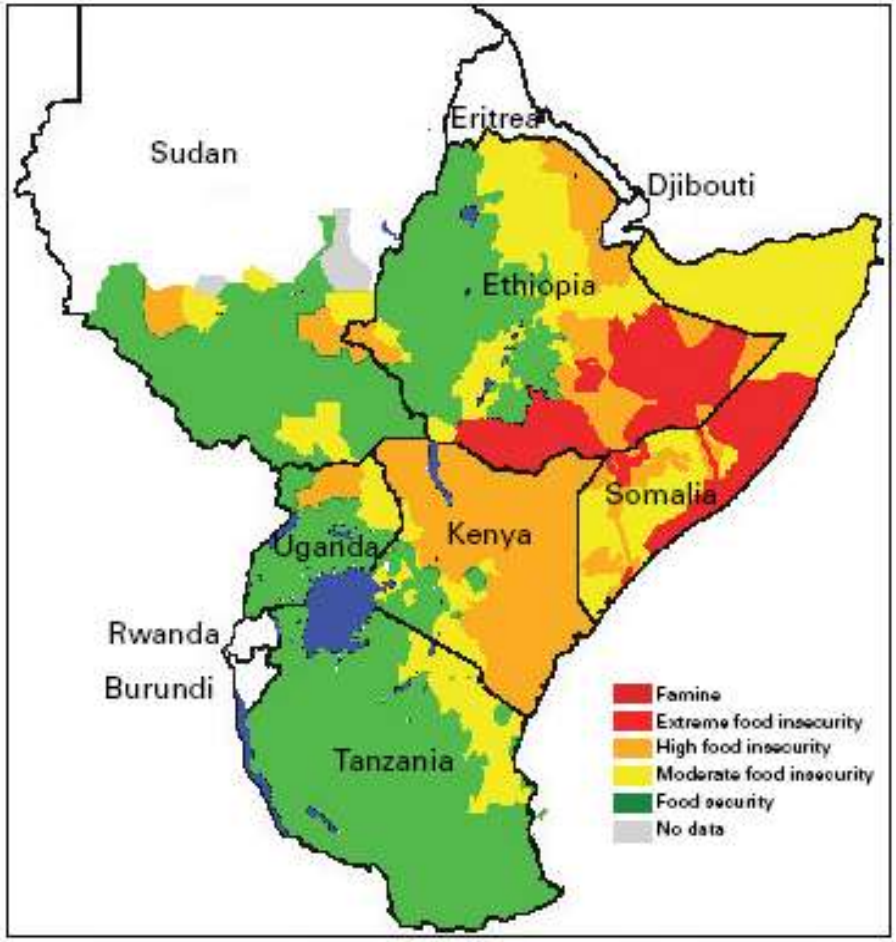
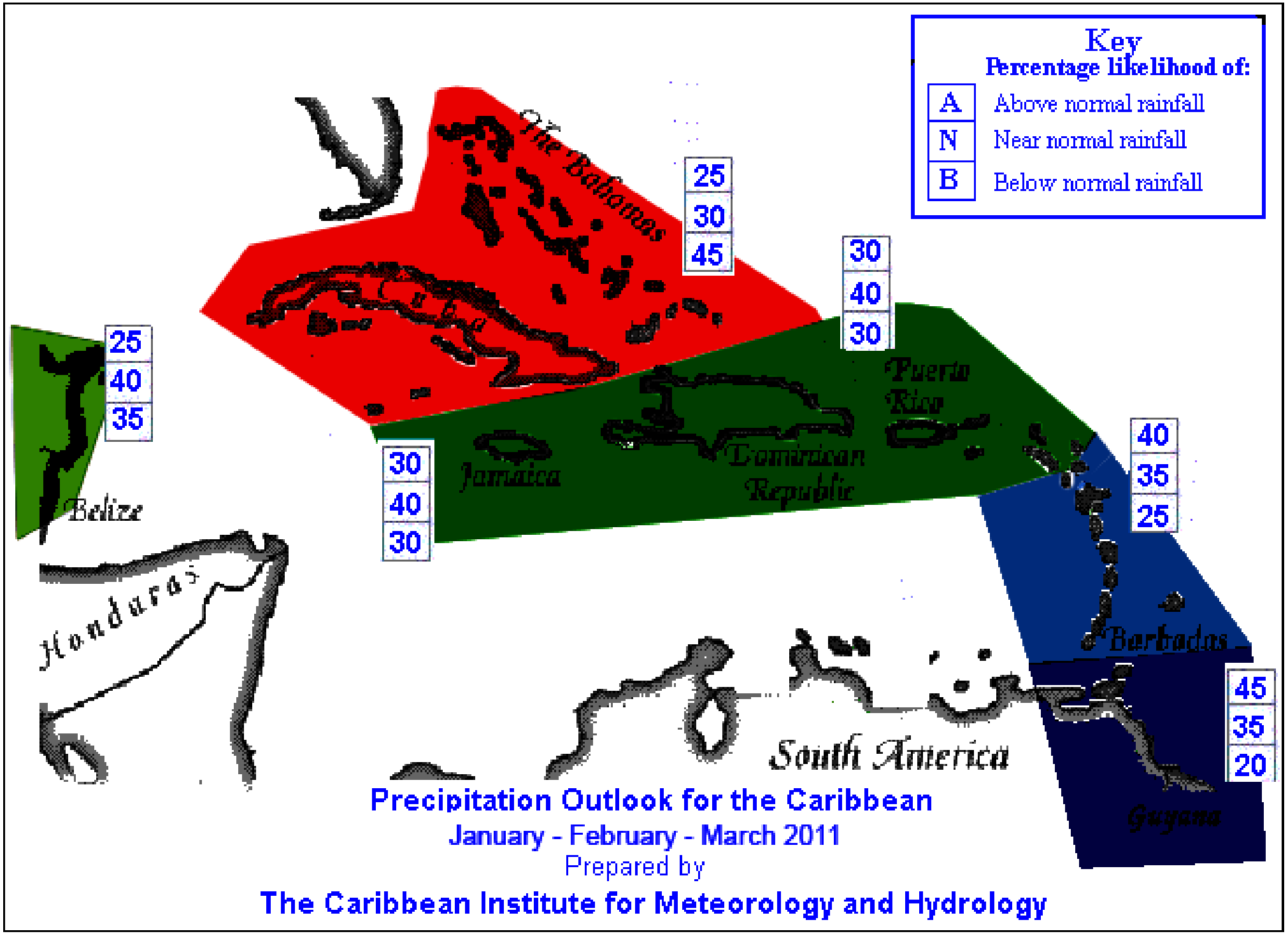


Figure 2(b) — Food Security Outlook for March to July 2008 by Famine Early Warning Systems Network (FEWSNET)



Precipitation Outlook for the Caribbean

January - February - March 2011

Prepared by

The Caribbean Institute for Meteorology and Hydrology

User Community for Climate Forecasts

- Producers use climate information to assist with many decisions:
  - Crop choice
  - Choice of cultivar (early or late)
  - Mixture of crops
  - Fertiliser use
  - Pest and disease control
  - Timing of the harvest
  - Irrigation scheduling
  - Area planted to a given crop (and/or rotation of fields);
  - Timing and amount of tillage
  - Stocking rates

Source: Huda 2006

The value of climate forecasts to users will depend not only on their perceived ‘accuracy’ but also on the management options available to the user to take advantage of information (Nicholls, 1991).

“Seasonal climate forecasting has no value unless it changes a management decision”

How much Nitrogen to apply given current low soil moisture levels and low probability of sufficient in-crop rainfall?

Which variety to plant given low rainfall probability values and high risk of damaging frost and anthesis?

The Farmer Decision Process

- Part of daily operations on farm and life
- Focuses on a “decision points” - how much fertilizer, how much area to plant, alternative crops, when to plant, likely returns, whole farm decisions…….
- Judgment on weather and climate impact on decision
- Discussion with neighbours, agronomists and other experts.
- Assessment of various options that take into account the above.

Effective Climate Communication

a) Is the information relevant for decisions in the particular agricultural system?

b) Are the sources/providers of information credible to the intended user?

c) Are farmers receptive to the information and to research?

d) Is the research accessible to the policymaker or decision-maker?

e) Is the information compatible with existing decision models and farming practice?

f) Do decision-makers have the capacity to use information?

Preconditions for successful Climate Forecast Application

a) Decision-maker vulnerability and motivation

b) Viable forecast-sensitive decision options

c) Predictability of climate fluctuations

d) Communication

e) Institutions and policy

Communication Channels

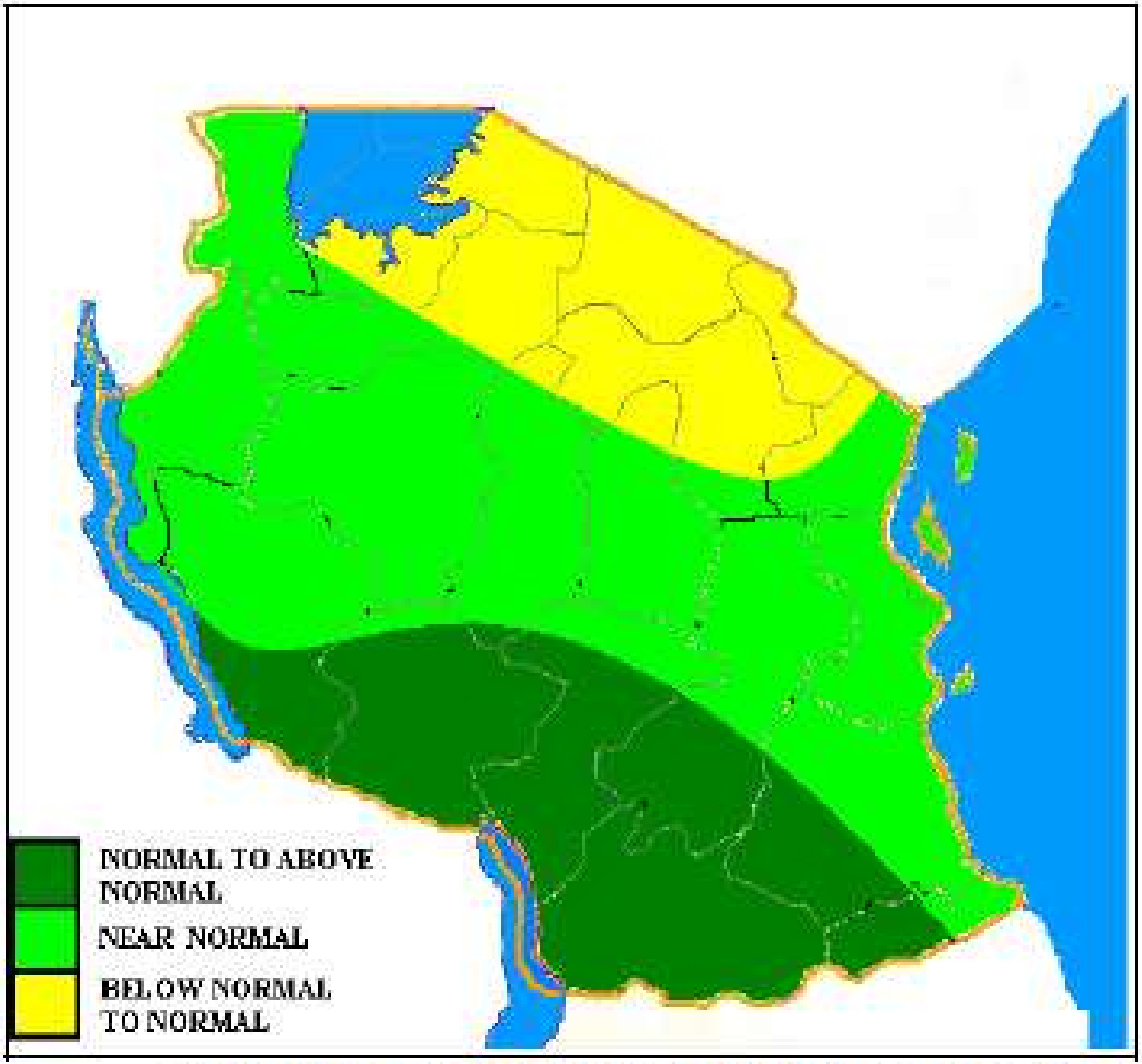
a) Workshops and meetings
b) Presentations and briefings
c) One-on-one technical assistance
d) Coordination with other ongoing projects
e) Work with the local media
f) Website development and maintenance
g) Courses on climate impacts and adaptation
h) Media (mass media and information)

Linking Decision-making calendar to Agroclimatic calendar for ENSO

- What are the sources of climate variability and controls on yields and operations?
- What are the critical months that influence the crop quality in the following harvest?
- How do rainfall and temperature (solar radiation, and so forth) affect these critical months?
- What is the critical period (which seasons) for ENSO impacts on yield predictability?
- How do different “warm” (El Niño) and “cold” (La Niña) events and their evolution phase affect yield?

Linking Decision-making calendar to Agroclimatic calendar for ENSO

- Where are the entry points for climate information into the annual cycle of operation decisions and into longer-term planning?
- What types of information (forecast characteristics) are identified as important and when, where and how should this information be provided?
- What other factors determine vulnerability? What practices and policies give rise to failures and to successes in the use of scientific information?
- What management actions can be taken with given probabilities and lead times?



Rainfall outlook for March to May 2011

Examples of Seasonal Climate Forecast and Agromet Advice

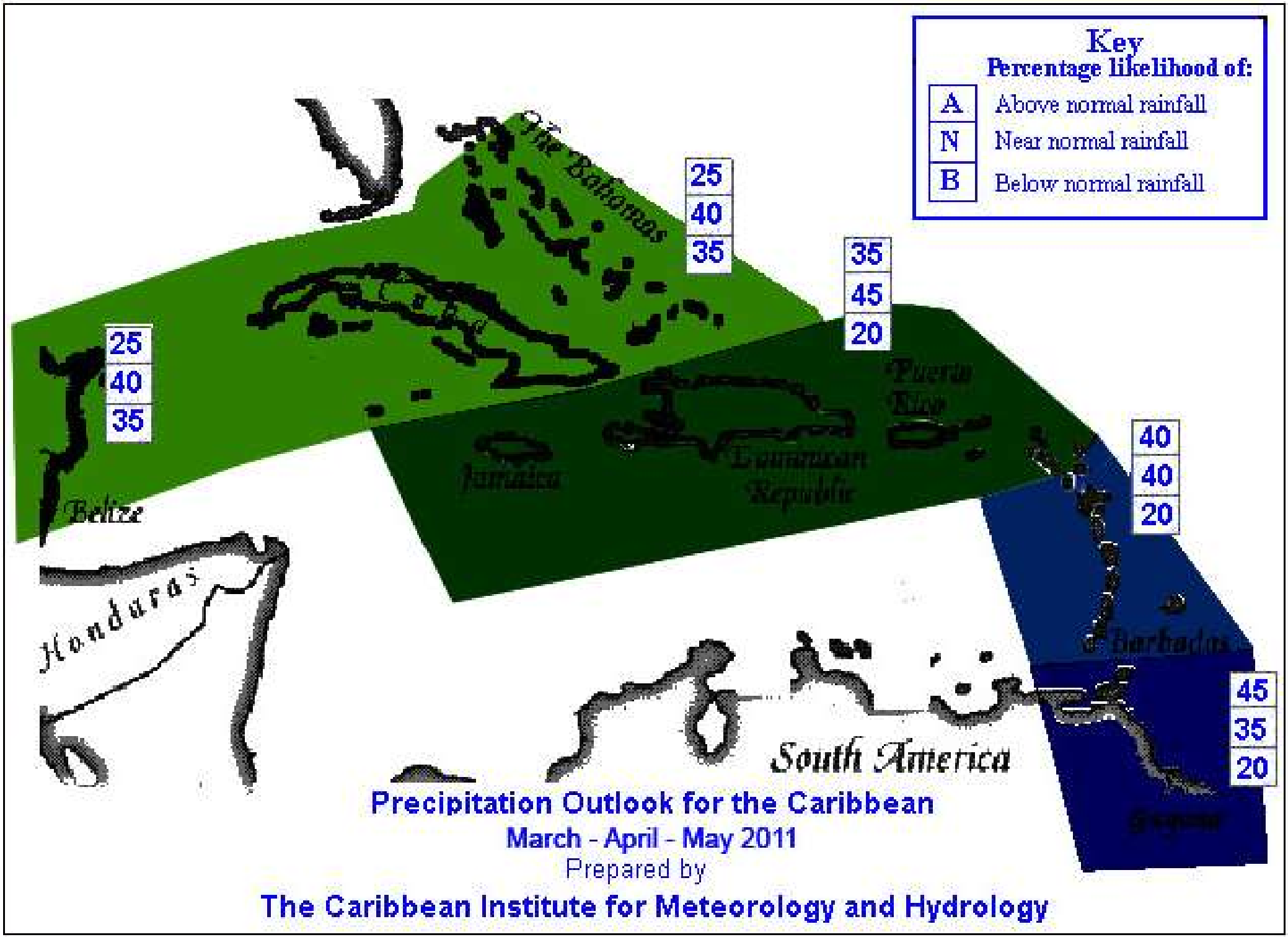
Agriculture and Food Security - Tanzania

Deficient soil moisture conditions are expected over areas which are expected to receive below normal rains. Farmers are advised to plant fast maturing crops and drought tolerant crops. Where possible, farmers should apply water harvesting techniques to capture available water. Areas which are likely to receive near normal rains, farmers are advised to go for a normal *Masika* season. Agronomic practices that conserve soil moisture such as timely weeding and thinning are emphasized.The expected above normal rains in unimodal rainfall areas are likely to cause excessive soil moisture levels, thus causing crop damage and occurrence of pests and diseases. Farmers are strongly advised to continue with normal practice as crops get into maturity and also seek more advice from agricultural extension officers.

Statement from the Sugar Research Institute of Fiji - Advice to Farmers

"Cool and dry weather conditions are expected to slowly settle in during the transition period (April-May). Farmers need to prepare for harvesting season and ensure that the cane access roads are in good conditions. Field assessments need to be carried out also to ease harvesting. The soil moisture status for the last few months was ample to moderate. Farmers need to adhere to daily weather forecast if they plan to plant cane during the remaining planting season (March-May) and assess soil moisture by feel. While average to above average rainfall is forecasted for the coming months, precautionary measures should be taken. Maintain drainage system to avoid water logging in the fields as well."

Source: Sugar Research Institute of Fiji


Key
Percentage likelihood of:
A Above normal rainfall
N Near normal rainfall
B Below normal rainfall
The Bahamas
25
40
35
35
45
20
Belize
25
40
35
Jamaica
Dominican Republic
Puerto Rico
40
40
20
Honduras
Barbados
45
35
20
South America
Precipitation Outlook for the Caribbean
March - April - May 2011
Prepared by
The Caribbean Institute for Meteorology and Hydrology

Thank You

World Meteorological Organization

Geneva

Switzerland

www.wmo.int/agm

Table 7.1. Agricultural decisions at a range of temporal and spatial scales that could benefit from targeted climate forecasts (Meinke and Stone, 2005)

Farming decision type	*Frequency (years)*
Logistics (e.g., scheduling of planting/harvest operations)	Intraseasonal (>0.2)
Tactical crop management (e.g., fertilizer/pesticide use)	Intraseasonal (0.2–0.5)
Crop type (e.g., wheat or chickpeas) or herd management	Seasonal (0.5–1.0)
Crop sequence (e.g., long or short fallows) or stocking rates	Interannual (0.5–2.0)
Crop rotations (e.g., winter or summer crops)	Annual/bi-annual (1–2)
Crop industry (e.g., grain or cotton; native or improved pastures)	Decadal (~10)
Agricultural industry (e.g., crops or pastures)	Interdecadal (10–20)
Land use (e.g., agriculture or natural systems)	Multidecadal (20+)
Land use and adaptation of current systems	Climate change