Adequacy of Current Observing Systems for Famine Early Warning

The breakout group began by reviewing the requirements and context of agricultural monitoring for famine early warning:

- EWS community has to outperform the media (CNN) in reaching the decision maker
- Need to use scientifically sound methods to present credible, convincing evidence that will evoke early response
- Need to focus on observations that constitute powerful, fundamental indicators

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What observing systems are currently being used?

- Precipitation observations from stations, and satellite estimates
- Satellite vegetation index data

Are they adequate?

Precipitation

- Station observations are good, but data available through WMO GTS are too sparse
    - Station networks are more extensive than what is available via GTS
    - National met service policies prevent more complete release of data
    - Many food insecure regions, especially pastoral areas, lack coverage altogether
- Satellite estimates offer complete spatial coverage at high frequency (3hr - 24hr) in near real time, and are freely available over the web from several sources
    - Satellite estimates suffer from biases that can produce misleading results

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What are prospects for continuity/enhancement?

Precipitation

- National met service 'cost-recovery' station data policies are unlikely to change any time soon
- Introduction of additional stations in food insecure regions faces obstacles of initial costs and maintenance, logistical and data management capacity
- Satellite estimates have good prospects for continuity/enhancement thanks to the international satellite constellation being implemented through the Global Precipitation Mission
- Satellite estimates can be enhanced through bias removal post-processing with (1) gridded station climatologies, and (2) blending of locally available, non-GTS station observations

Actions

- FEWS NET will identify 3-4 countries/regions where need is great and prospects are high for cooperation to create gridded climatologies and implement blending of locally available extra station data
- Approach WMO for endorsement of these activities, easing data access policies

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Are they adequate?

Vegetation Indices

- NDVI from AVHRR has a long history of use in famine early warning, are produced regularly every 10-15 days, and are available freely in near real time over the web, and offer a long time series (since 1981)
- NDVI from AVHRR has seen decreasing utilization for famine early warning due to ambiguity of calculated greenness anomalies, loss of confidence
    - Removal of noise in data time series is difficult (sensor aging, orbital degradation), especially for dual gain instruments as on NOAA 17
- NDVI from MODIS has proven to be of excellent quality and well-suited to characterization of crop conditions, despite shorter time series (since 2000)
- Access to NDVI from MODIS through conventional DAAC procedures is problematic
    - Delays of several days following fixed compositing periods can mean data are ‘old’ for early warning purposes
    - Data tiles cannot be downloaded to some developing countries due to excessive file size versus available band width

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What are prospects for continuity/enhancement?

Vegetation

- NASA/USDA/UMd are implementing a global, near real time system for MODIS NDVI
- No further MODIS missions are planned. Continuity with data from the VIIRS instrument subject to delays, with consequent risk of a data gap

Actions

- NASA/USDA/UMd investigate famine early warning requirements for spatial coverage and download file size
- Investigate alternative satellite platforms for follow-on instruments
- Investigate data from wide field of view instruments (India-AWiFS, CBERS, etc) as higher resolution sources of NDVI
- Investigate SAR imagery for detection of crop emergence