GREATER HORN OF AFRICA (GHA) FOOD SECURITY BULLETIN

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SUMMARY AND IMPLICATIONS

The current food insecurity in the Greater Horn of Africa (GHA), mainly affecting pastoralists, has become almost chronic. The estimated number of people at risk has been stable from month to month. The region's food insecurity is due to multiple factors, including internal civil insecurity, tensions with neighboring countries, unfavorable climate and poor policies (including restraints to regional food commodity trade). The net result is increased pressure on already stressed livelihoods. The estimated number of people at risk is currently 18 million and will remain the working figure until most crop production estimates of the March-May 2005 rainfall season are released.

This report focuses on the use of remote sensing tools and available field information to assess crop performance. The Water Requirement Satisfaction Index (WRSI), which has enhanced monitoring and forecasting of crop performance, is such as tool. A recent joint mission conducted by USGS, USDA, FEWS NET and the Ministries of Agriculture in Kenya and Tanzania confirmed the relationship between the information provided by the WRSI satellite imagery and ground conditions, making this tool a useful one for monitoring crop conditions and giving an early, qualitative estimate of production.

OVERVIEW OF FOOD SECURITY IN THE GHA

The official production estimates of recent joint crop and food assessments in many GHA countries have not been officially released or integrated into individual country food security updates. Moreover, most populations currently at risk live in areas of the Northern Sector, mainly in Ethiopia and Eritrea, where the main crop season has just begun. Therefore, the estimated figures of food insecure populations – 18 million – are maintained. To put the magnitude of food insecurity in this region in context, its worth noting that out of an estimated 30 million people usually facing very high risk of food insecurity in Africa in recent years, over 60 percent (17 – 19 million) live in the GHA region. Based on the absolute number of population at risk (not necessarily severity), the five countries of the GHA with the most difficult food security conditions are Ethiopia (estimates of around 9.2 – 12 million people at risk), Uganda (2.7 million), Eritrea (2.2 million), Kenya (1 million) and Somalia (1 million). Sudan, particularly in Darfur and Bahr-el-Ghazal regions, also faces a serious food crisis. The causes of food insecurity vary across the region and are often multiple, including civil wars, inter clan wars, tension with neighboring states, poor rainfall, environmental degradation and poor sanitation and nutritional practices. The end result of these factors has been a deteriorating physical environment, limited livelihood options, chronic poverty and loss of resilience to various shocks.

One of the main current humanitarian concerns in the region is Ethiopia's chronic food insecurity, which has yet to be adequately addressed despite the efforts invested. The promising Productive Safety Net Program is ironically causing a lot of concern. It was planned to start in January, but as of July it had not effectively started in many areas in large part due to funding, administrative and financial infrastructure issues. The most problematic delays have been in the central and southern parts of the country. Its innovative cash transfer component is the one causing major delays.

In Sudan, the death on 30 July 2005 of Dr. John Garang (the leader of SPLM/A and a key protagonist of the Comprehensive Peace Agreement with the Government of Sudan) had then created concern that the return of peace may derail, but this risk seems now greatly reduced. In northern Bahr-el-Ghazal region, low availability of wild foods, poor crop performance and a high number of returning internally displaced populations have already created a serious food crisis, while in the Darfur region, the heavier than normal rains are hampering humanitarian assistance.

On a positive note, the new season in the Northern Sector of the GHA has been performing well. If rains remain favorable, the number of people requiring food aid will decline towards the end of the year.

The GHA Food Security Bulletin is a collaborative initiative of the Famine Early Warning Systems Network (FEWS NET), the Regional Center for Mapping of Resources for Development (RCMRD), the Desert Locust Control Organization (DLCO), the Livestock Early Warning System (LEWS), the World Food Programme (WFP) and the United States Agency for International Development (USAID)

SPECIAL FOCUS: CROP FORECASTING AND MONITORING IN THE GHA, WITH FOCUS ON WRSI

INTRODUCTION

Agriculture – mainly rain fed agriculture – accounts for more than 30 percent of the Gross Domestic Product in GHA countries (see Table 1). This dependence leaves economies and populations vulnerable to weather vagaries, especially drought. Thus, continuous and reliable monitoring of the pre-season and crop growing conditions is critical for assessing agricultural production, an important component of food security in the region. Because of a drought's slow onset, the current suite of remotely sensed imageries makes change in vegetation and crop conditions easy to detect and monitor. The satellite imagery, though, needs to be corroborated and verified through local field observations. However, as with any other indirect observations, there is a need to validate and adjust the tools with "ground-truth" information to ensure that they reflect actual field conditions as accurately as possible.

Table 1: Percentage Contribution of sectors in the GDP in the GHA Region; Year 2003 (Information for some countries is unavailable for that year).

	Agriculture	Industry	Services etc…
Eritrea	14%	25%	61%
Ethiopia	42%	11%	47%
Kenya	16%	20%	65%
Rwanda	42%	22%	37%
Tanzania	45%	16%	39%
Uganda	32%	21%	46%
Average	**32%**	**19%**	**49%**

Source: The World Bank

A recent joint USGS/USDA/FEWS NET/Ministries of Agriculture mission took place in June-July 2005. The mission's aim was to validate the USGS/FEWS NET crop Water Requirement Satisfaction Index (WRSI) outputs. Through field verification, the performance of these products regarding maize growing zones of Kenya and Tanzania would be improved. This month's special topic focuses on remote crop monitoring and forecasting techniques and presents the findings of that joint mission. It is also expected to help readers better understand this important crop monitoring tool, which is a regular feature in this bulletin.

CROP FORECASTING AND MONITORING PROCESSES AND TECHNIQUES IN THE GHA

The regional and national consensus seasonal forecast, issued by the IGAD Climate Prediction and Application Center (ICPAC) and National Meteorological Services (NMS), serves as a critical initial input in the process of crop monitoring and forecasting. However, it only applies to a limited number of countries within the region. In those countries, the local media and the Ministry of Agriculture (MoA) extension officers have highlighted its importance and widely disseminated the information to support response planning. One new application of seasonal rainfall forecasts, still under development, is the GHA food security outlook, which is based on climate and non-climate related factors. Food security outlooks could provide useful foresight on the potential impacts of the rainfall forecasts on pre-existing hot spots of food crises in the region.

During the crop growing season, MoA's extension officers normally monitor the evolving crop conditions and, with partners, estimate production. Unfortunately, MoA's crop monitoring is sometimes done rather late and is incomplete. The techniques used to estimate the size of cropped areas and crop production are varied and limited by the available resources. At best, the extension officers undertake statistical random sampling of farms to estimate the size of cropped areas and potential maize yield. The information collected is aggregated from lower administrative levels to district levels in most of the GHA countries. Unfortunately, due to the economic reforms implemented in Uganda, Ethiopia, Rwanda and Tanzania, the number of MoA's extension officers has greatly declined, resulting in more subjective techniques and further delays in crop data collection and dissemination. Information on crop conditions is also sometimes provided by NGO field-based monitors, but this information has been incomplete and insufficient for use at national levels. The concern of availability, reliability and timeliness of field-based data has led FEWS NET to seek alternative methods of supplementing the existing crop monitoring information and field visits.

The main remotely sensed product, which has over the years been widely used by FEWS NET and technical partners, is NASA's Normalized Difference Vegetation Index (NDVI). This product has been especially beneficial for monitoring changes in vegetation conditions against an existing database covering over two decades (1981 to present). Some of the recent applications of this index were the monitoring of the multi-year drought in Sool Plateau in Somalia and in southeastern Kenya and the analysis of resource-based conflicts among pastoralists living in the Karamoja Cluster (Kenya, Uganda and Sudan border areas).

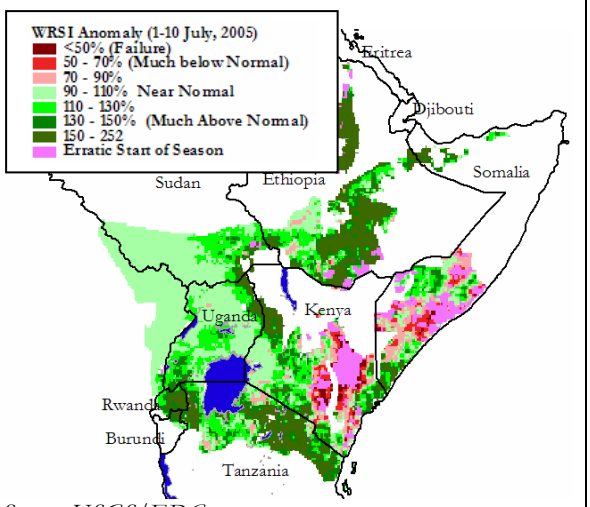
More recently, the Livestock Early Warning System (LEWS) forage products have also been adopted in some countries of the GHA as a regular indicator or pasture and browse conditions.

USING WRSI TO ESTIMATE CROP PERFORMANCE

Over the past 10 years (1996 – present), a spatial tool for crop monitoring was developed by USGS/FEWS NET to assess crop performance, based on estimates of the proportion of water that a given crop at a given stage of its growth can have access to (mainly from rainfall in rain-fed systems), compared to its actual requirements. Rainfall estimates, an input to WRSI, are based on a synergy of satellite and rain gauge observations. FAO's soil and crop characteristics serve also as inputs to calculate crop performance indices. WRSI has gradually gained acceptance as a tool for monitoring and forecasting crop conditions, especially in marginal agro-pastoral areas where rainfall is a limiting factor to agricultural production. Currently, the tool is largely used to monitor maize and sorghum, the main cereal crops of the GHA.

Based on its implementation in different regions of Africa and elsewhere, the crop monitoring tool has proved useful in identifying the erratic start of rainfall seasons, crop water stress and crop performance. It has also provided reliable forecasts on crop yields towards the end of the season, with good lead times in the drought-prone GHA countries. After several field validations, FEWS NET and partners have found it to be a very useful tool for early warning. This bulletin has frequently featured some of the WRSI crop monitoring products to support analysis of crop growing conditions, as illustrated in Figure 2. The WRSI anomaly image for July 10, 2005 spatially presents crop production prospects for the recently concluded 2005 long-rains season in the GHA. Overall, near normal maize production is expected in key agricultural areas of Kenya, Uganda and Tanzania, but major concerns about crop failures were raised for marginal agricultural areas of southeastern Kenya and key agricultural areas of southern Somalia. These conclusions were later confirmed by field assessment reports. WRSI and products derived from that imagery are freely available as daily and 10 days images at http://earlywarning.usgs.gov/adds.

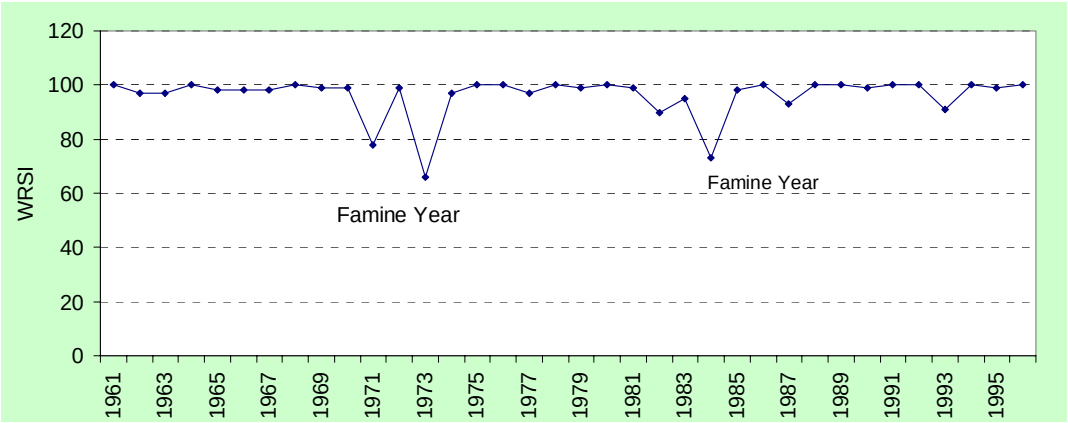
Figure 2: WRSI anomaly map, July 10, 2005



Source: USGS/EDC

To identify drought prone areas, the WRSI tool was run for a historical record of rainfall data (1961 -1996) for the northern sector of the GHA region during the June – September rainy season. Figure 3 shows that it identified all drought years in Dessie District of Ethiopia for the past 36 years. It confirms that low crop index values coincide with drought years in the district and other areas in Ethiopia. The 1984 drought for example was accurately picked up.

Figure 3: Historical Analysis of Maize Crop Indices in Dessie District, Ethiopia



***Source**: USGS/EDC*

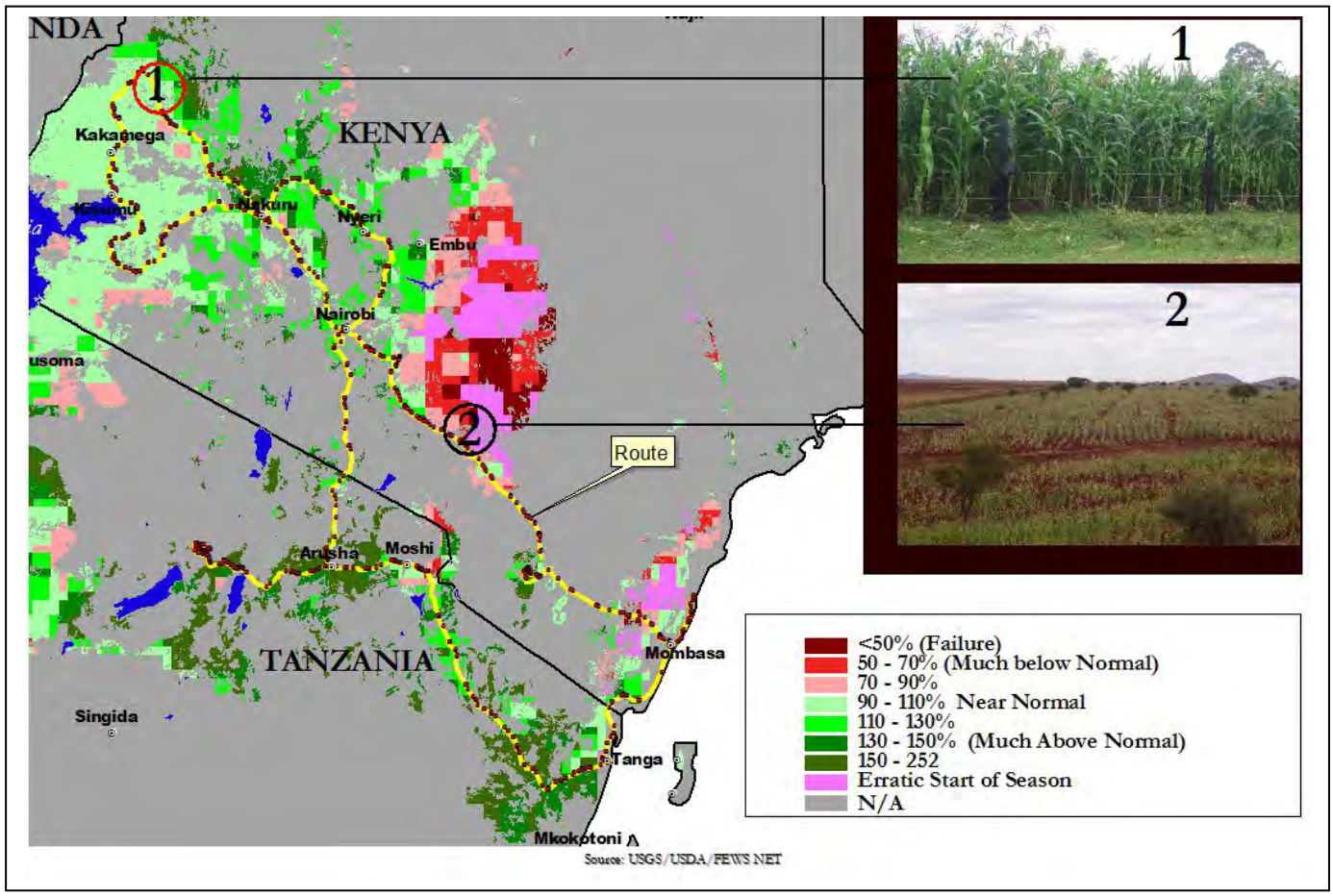
The improvement of remote-sensed crop monitoring and forecasting requires rigorous field validation and updating of existing field information. Currently, this activity has only been undertaken in Kenya and northern Tanzania (see next section). There is a need to conduct similar activities in Ethiopia, Eritrea, Somalia, Uganda, Rwanda and Sudan.

THE JUNE – JULY 2005 JOINT WRSI VALIDATION MISSION IN THE GHA

The main results of the recent mission were GPS-linked digital photos for selected maize fields (Figure 4) and other land cover types along the route followed during the trip. Meetings and interviews were also held with the MoA extension officers and farmers to obtain information on start of the season, types of seeds used, fertilizer use and harvesting dates. By and large, it was confirmed that the conditions simulated by the WRSI matched well with the actual conditions on the ground.

Adjustments to the WRSI monitoring tool were made at the end of the mission to take into account the real field conditions. For the Kenyan highlands, for example, the tool was adjusted after finding that the growing season was over 6 months long, and that most planting was done in February in southwestern Kenya. This knowledge was critical in making the tool more realistic. It was also recommended that new maize varieties and farming practices currently being introduced in the region be regularly monitored in order re-adjust the WRSI tool and to complement it with other mechanisms if required.

Figure 4: The joint crop tour mission map in Kenya and Tanzania, with the Africover herbaceous crop overlay on WRSI.



The main conclusions drawn by the mission were the following:

1. The FEWS NET's WRSI spatial crop tool is useful in monitoring maize growing conditions in Kenya and Tanzania, excluding some of the highland areas where the length of the growing season was found to be longer than initially thought.
2. The Kenyan Department of Remote Sensing and Resource Surveying (DRSRS) generates maize density maps using aerial photography, which in addition to the FAO's Africover's aggregated herbaceous crop maps, delineated well the maize growing areas and other land use practices found in the study area.
3. The IGAD's Agricultural Ecological Zones (AEZ) map confirmed the changes in length of growing periods for maize and was used to fine-tune the crop tool.
4. WRSI products provide reliable indications of the expected crop conditions two-thirds through the maize and sorghum crop growing season.

MORE ON THE GHA FOOD SECURITY BULLETIN…

This bulletin draws from the FEWS NET regular monthly reports, with additional contributions from network partners whose names and logos appear at the bottom of the first page. Please consult **http://www.fews.net** for in-depth analysis of the countries where FEWS NET has a national representative: Eritrea, Ethiopia, Kenya, Rwanda, Somalia, Southern Sudan, Tanzania and Uganda. The World Food Programme provides the information on Burundi, Democratic Republic of Congo (DRC) and northern Sudan.

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