PART I – BACKGROUND

The regional strategic programme framework for Cassava diseases in central, eastern and southern Africa (CaCESA) covers 15 countries[1] (see Figure 1). The population of the area is around 290 million people, a significant proportion (estimated 20–25 percent) of which uses cassava as a staple. The local importance of cassava depends on the role it plays with other food crops in local diet and food basket. Cassava being a staple crop, cassava diseases have an immediate impact on food supply. In some districts, food shortage and insecurity have reached the point where farm families require external assistance.

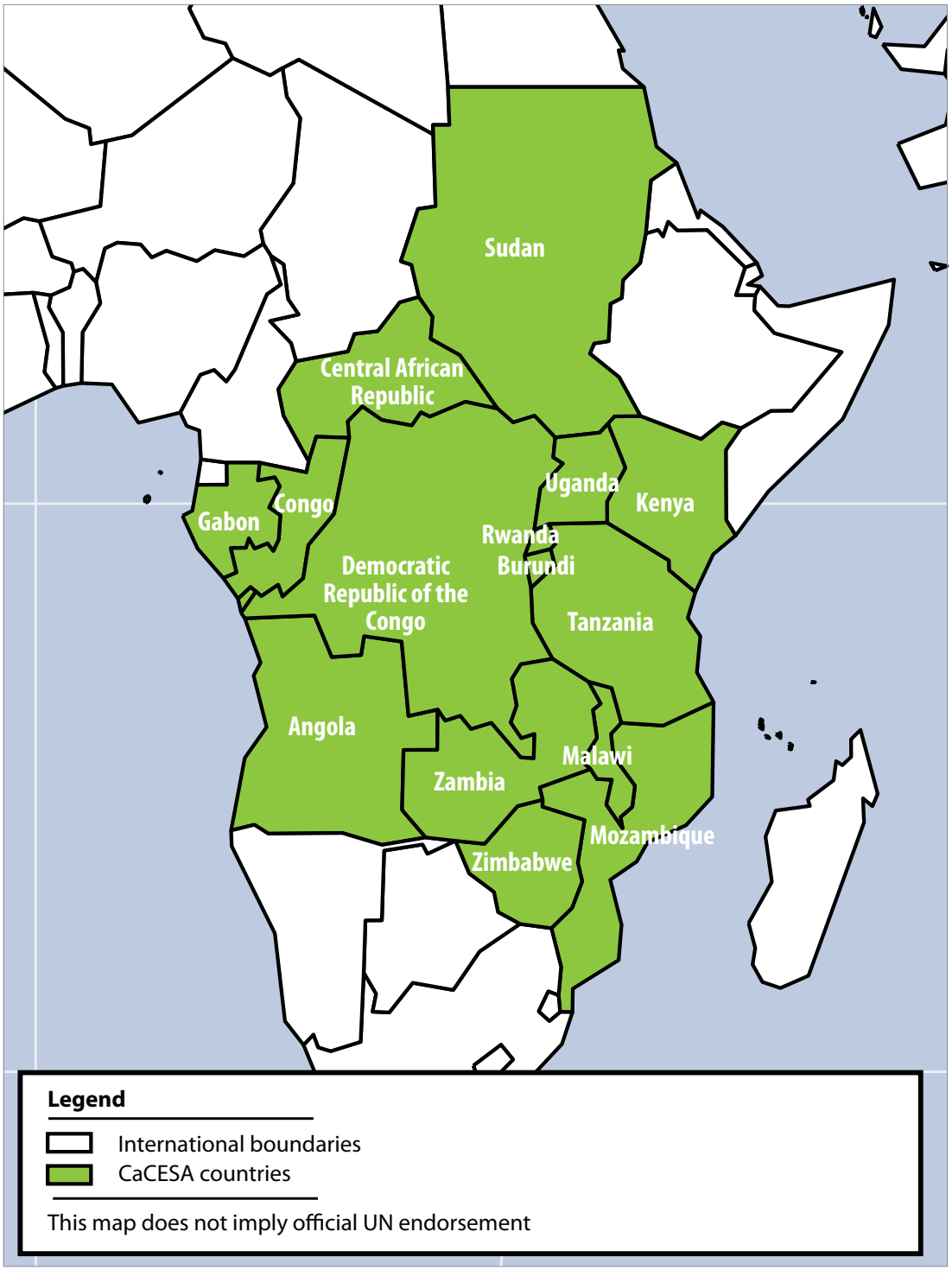
In this situation, vulnerable people who use cassava as a major food crop can be helped to recover from displacement and/or shocks in a sustainable manner only if they can access good quality and disease-free planting material. This requires solid services for breeding and releasing new varieties, capable arrangements for clean stem multiplication and the capacity for local disease control under an improved field production system.

Some statistics for the countries included in the CaCESA framework:

- Total population: 291 800 000[2]
- IDP: 5 598 000[3]
- Refugees: 1 598 000[4]
- Poverty incidence: 51 percent average[5]
- Proportion of undernourished: 39.5 percent[6]
- Vulnerable population exceeds 30 million[7]. These are persons who are at risk of becoming food insecure under exposure to risk factors and stressful situations

[1] Countries included in the CaCESA framework: Angola, Burundi, Central African Republic, Congo, Democratic Republic of the Congo, Gabon, Kenya, Malawi, Mozambique, Rwanda, Sudan, Tanzania, Uganda, Zambia and Zimbabwe
[2] The State of Food Insecurity (SOFI) 2008
[3] Internal displacement monitoring centre (IDMC)
[4] United Nations High Commissioner for Refugees (UNHCR)
[5] SOFI 2008
[6] World Bank
[7] Food and Agriculture Organization of the United Nations (FAO) and Famine Early Warning System Network (FEWS NET)

Figure 1: CaCESA countries



1.1 Vulnerability[8] in the region

Despite sustained humanitarian efforts, 115 million people across the 15 countries targeted by the CaCESA remain undernourished.

Precarious livelihoods and a succession of crises, both natural and human-induced, have displaced millions, eroded coping capacities and affected the resilience of communities.

There is a growing need for new strategies and greater collaboration among all humanitarian partners to achieve a sound emergency situation analysis and response. A stronger focus is needed on building resilience in order to assist vulnerable populations who are no longer able to restore their own livelihoods.

Table 1: Estimate of IDPs and refugees by country included in the CaCESA and proportion of undernourishment

Countries	Population[9]	IDPs[10]	Refugees[11]	Proportion of undernourished in total population 2003–2005[12] %
Angola	15 600 000	< 19 000	12 069	46
Burundi	7 600 000	Undetermined	24 468	63
Central African Republic	4 100 000	108 000	7 535	43
Congo	3 500 000	< 7 000	38 472	22
Democratic Republic of the Congo	56 900 000	1 400 000	177 390	76
Gabon	1 300 000	Undetermined	8 826	-
Kenya	34 700 000	300 000	265 729	32
Malawi	12 900 000	Undetermined	2 929	29
Mozambique	20 100 000	Undetermined	2 767	38
Rwanda	9 100 000	Undetermined	53 577	40
Sudan	36 900 000	1 935 000	222 722	21
Tanzania	37 500 000	Undetermined	435 630	35
Uganda	28 000 000	869 000	228 959	15
Zambia	11 300 000	Undetermined	112 931	45
Zimbabwe	13 000 000	960 000	3 981	40
Total	**291 800 000**	**5 598 000**	**1 597 985**	

[8] **Vulnerability** refers to the full range of factors that place people at risk of becoming food insecure. The degree of vulnerability for an individual, household or group of persons is determined by their exposure to the risk factors and their ability to cope with or withstand stressful situations

[9] SOFI 2008

[10] IDMC, December 2008; UNHCR, December 2008

[11] IDMC, December 2008; UNHCR, December 2008

[12] SOFI 2008

1.2 Importance of cassava in the region

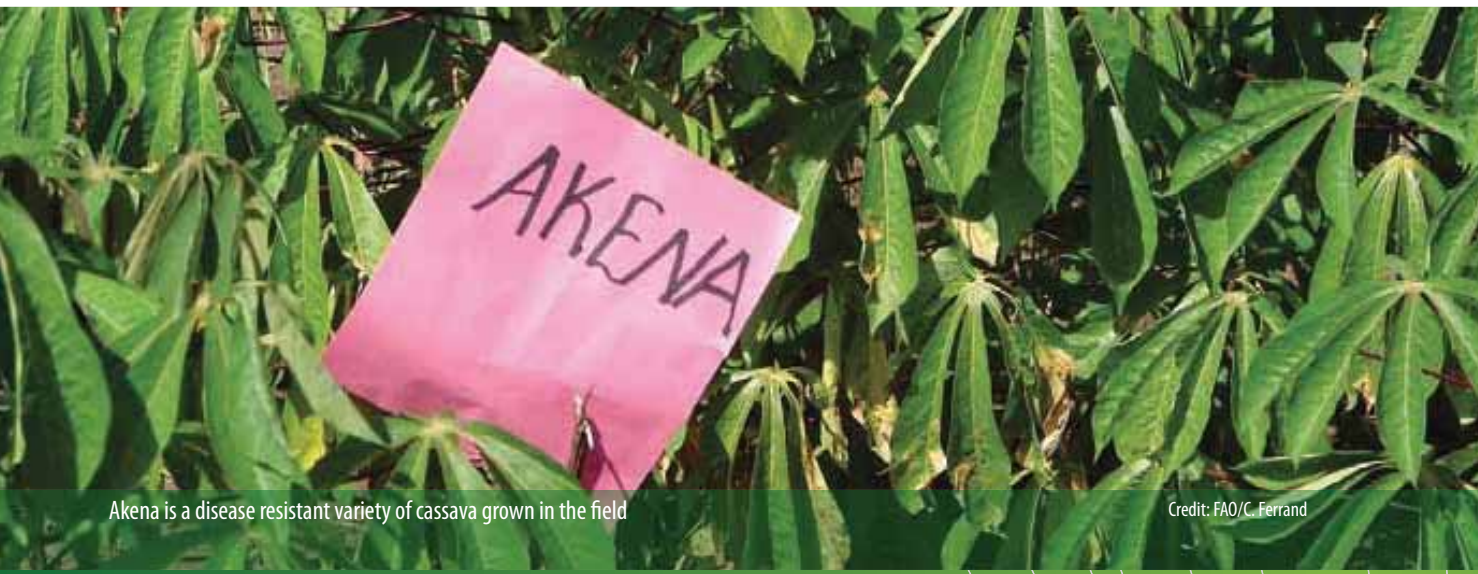
Cassava is produced mostly by smallholders on marginal and sub-marginal lands in the humid and semi-humid tropics. It is efficient in carbohydrate production, adapted to a wide range of environments and tolerant to drought and acidic soils. In Africa, an estimated 70 million people are dependent on cassava as a primary source of food contributing over 500 kcal[13] per day per person.

In the targeted 15 countries, over 4 million people live in districts of high cassava production[14]. Often these are among the most remote and poorest areas. Cassava has a reputation as a poor person's crop, a crop of last resort, though it is also stigmatized due to the toxicity of certain varieties if they are not properly prepared.

Cassava's importance for food security in the region is attributable to its intrinsic character. Cassava is tolerant to drought and can generate acceptable yields even on depleted and marginal lands. In the event of civil strife, cassava can remain in the soil and untended, and normally be harvested later without major qualitative deterioration. Cassava is not usually easy to loot or steal in large quantities because of the labour for harvesting and the need to carry heavy roots from the field coupled with the processing requirements, and so will continue to be available even after temporary displacement of the household. Also, the crop does not require the use of expensive inputs such as fertilizer or purchased seeds (it is vegetatively propagated, usually by the farmer taking their own cuttings).

When compared to other cassava producing regions such as West Africa or Latin America, yields in central, eastern and southern Africa tend to be lower. Of the countries in the region producing over 500 000 tonnes per year, Central African Republic, Zambia, Rwanda, Mozambique and the Democratic Republic of the Congo stand out as below the regional average of 8.8 tonnes/hectare. Annex 1 provides the cassava productivity and production in 2007 for the 15 countries targeted by CaCESA.

[13] SOFI 2008
[14] FAO estimates



Akena is a disease resistant variety of cassava grown in the field

Credit: FAO/C. Ferrand

Also, the full range of potential uses of cassava is under-exploited in central, eastern and southern Africa. In some countries (notably Malawi and Zambia) there are programmes to promote further development of the cassava production sector, as an alternative to maize in increasingly drought-prone conditions, with investments in post harvest treatment facilities, and marketing, but these are in their initial stages.

1.3 Cassava related diseases

Leaves of a healthy cassava plant

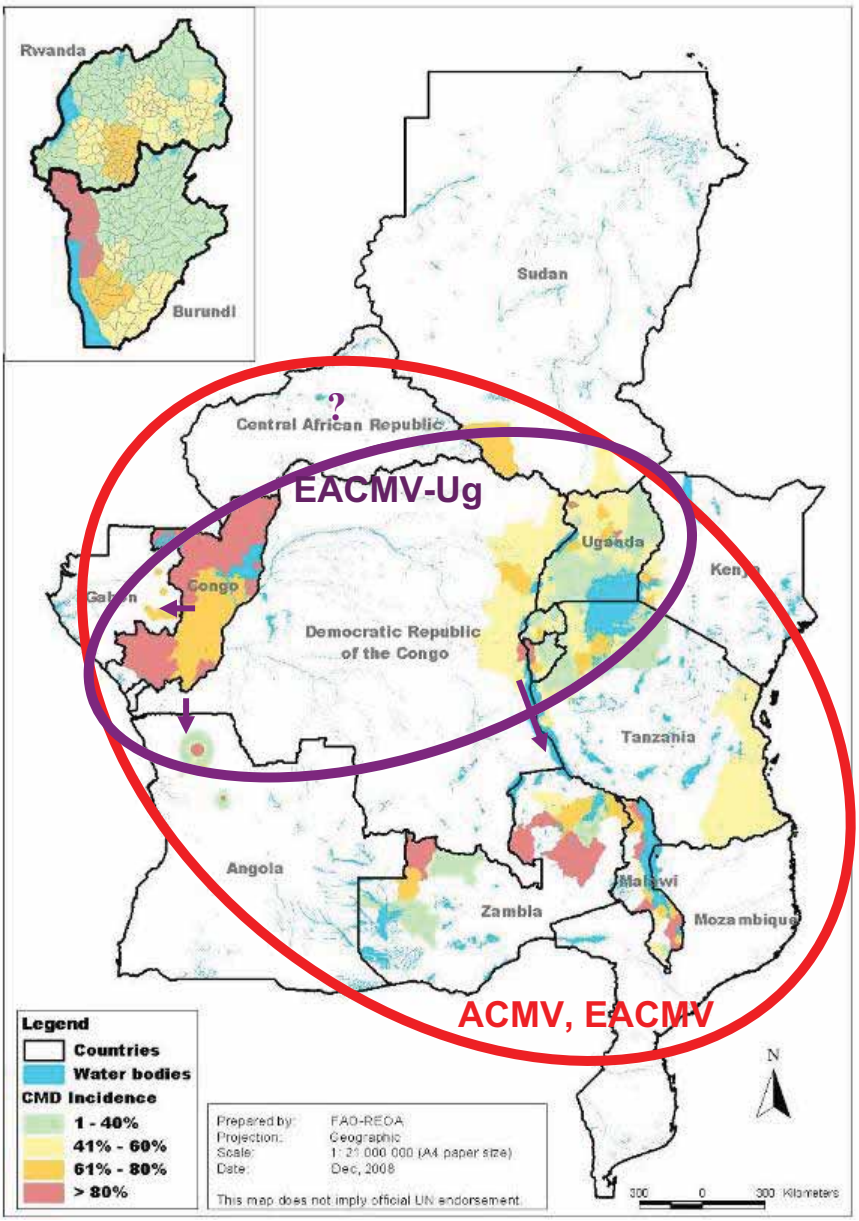
The shrunken and discoloured leaves of a cassava plant sick with CMV

Credit: FAO/G. Napolitano

In addition to wide variations in productivity, the whole cassava production system in the Great Lakes region is under serious threat from new strains of cassava viruses, such as the Uganda variant of the East African Cassava Mosaic Virus (EACMV-Ug) and CBSV. These are just the latest in a long line of strains of disease affecting cassava crop (with new variants appearing in 1983, 1993, 1997, 2004). Although timing is not regular, depending on biological events and conditions such as area under cultivation and climatic factors, it seems that major new diseases or strains of cassava disease tend to appear every 7–10 years.

The two current viral diseases, spread by a whitefly vector (Bemisia tabaci) and the movement of planting materials, now pose a severe threat to cassava culture in many areas in the region. According to researchers at the National Agricultural Research Organisation (NARO), Uganda, there has been a significant increase in the density of whitefly populations in recent years, to the extent that whitefly has in itself become a crop pest causing damage to cassava leaves as well as being a disease vector. Maps showing the extent of the spread of the various strains of cassava mosaic virus (CMV), and CBSV among the 15 countries are able to show that the epicentre for the newest strain of CMV has reached the southern parts of Burundi. At the local level, the spread pattern is not regular and is not predictable, which suggests that movement of planting material is a factor in the spread, particularly if the stems are not of the highest quality and health status.

Figure 2: CMV incidence (various strains) in eastern, central and southern Africa in 2008



Source: Adapted by FAO from various IITA reports.

Figure 2 shows (purple) that the most severe variant (to date) of CMV, the EACMV-Ug, has spread from Uganda to devastate cassava production throughout the Great Lakes region, reducing cassava yields of affected farms by up to 80 percent, and the disease appears to be moving southwards. The spread of the disease has been accelerated by the transport of vegetative material by population displaced as a result of conflicts. Another effect of the conflicts in the Democratic Republic of the Congo and Burundi is that communities cut off from government services have been unable to organize large-scale, coordinated responses to the disease. Figure 2 (red) also shows the broader area which is affected by the previous strains of CMV, namely the EACMV and the Africa cassava mosaic virus (ACMV).

Figure 3: Distribution of CBSV in eastern, central and southern Africa in 2008

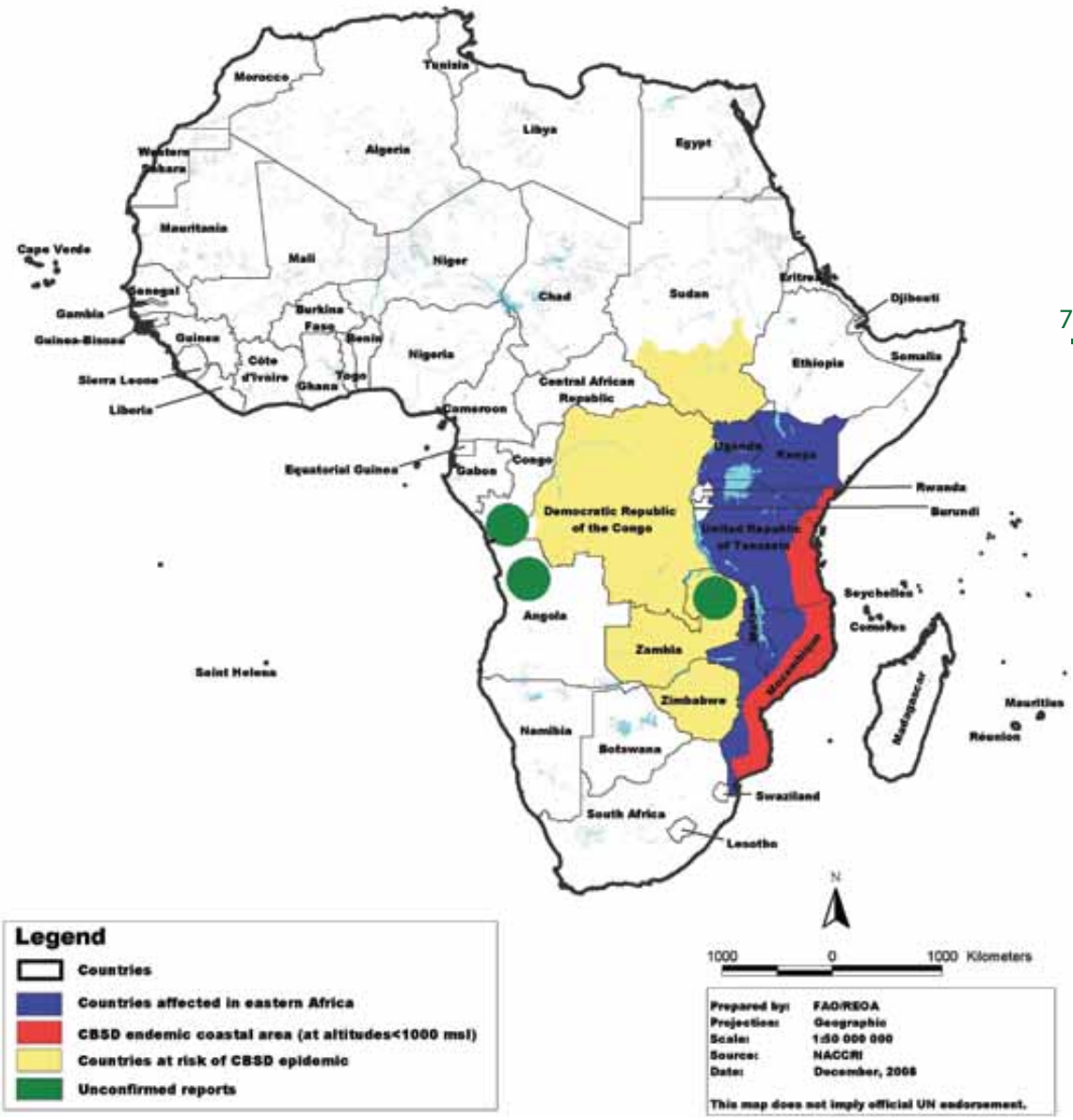


Figure 3 illustrates the distribution of CBSV, a viral disease spread mainly through infected planting materials. Symptoms can affect leaves, stems and roots. CBSV is more difficult to diagnose. Definitive signs of root damage appear late, making early positive identification of the disease difficult. Again losses can be close to total in affected fields. Previously (from the 1930s), CBSV was known only in lowland and coastal east Africa (below 800 metres above sea level) and along the shores of Lake Malawi. Since 2004, there have been worrying reports of CBSV at higher altitudes in Uganda, western Kenya and north-western Tanzania (Great Lakes Cassava Initiative [GLCI] 2008). In some cases, e.g. Ukerewe (Lake Zone, Tanzania), the impact of the latter has had a devastating effect.

For the time being, the replacement or substitution of cassava varieties susceptible to viral diseases with varieties tolerant or resistant to these diseases has been the main direction favoured by national agricultural research institutes and the International Institute of Tropical Agriculture (IITA). At the same time, large-scale distribution of planting materials also has the drawback that it tends to reduce the diversity of varieties grown in large areas,

CMV symptoms on cassava plants

notably discolouration of leaves; root yield is dramatically reduced

Credit: FAO/C. Ferrand

and that this in turn can render the cassava production system more susceptible – sooner or later – to subsequent pests and diseases. A combination of short- and longer-term options is therefore required to address the immediate needs of rural populations as well as to ensure long-term sustainability of the crop and preserve biodiversity.

CBSV disease symptoms on cassava plants and roots
leaves and stem show limited symptoms but roots are damaged and unusable

Credit: IITA

Table 2: Cassava disease status by country (in CaCESA)

Countries	Affected by Ug-EACMV	Affected by CBSV	Affected by a previous strain of CMV
Angola	X	X	X
Burundi	X		X
Central African Republic			X
Congo	X		X
Democratic Republic of the Congo	X	X	X
Gabon	X		X
Kenya	X	X	X
Malawi		X	X
Mozambique		X	X
Rwanda	X		X
Sudan	X		X
Tanzania	X	X	X
Uganda	X	X	X
Zambia			X
Zimbabwe			X

1.4 Current cassava disease programmes

Given the severity of the current cassava disease outbreaks and the threat they pose to the food security of millions of people, a number of donor-funded cassava disease programmes have been operational within disease-affected areas of Burundi, the Democratic Republic of the Congo, Kenya, Rwanda, Tanzania and Uganda. In particular:

a) The FAO Regional Cassava Initiative, sponsored by the Humanitarian Aid department of the European Commission (ECHO), involves: (i) the multiplication and distribution of CMV-resistant planting material in five worst-affected countries; (ii) support to country and regional data and information management; and (iii) the basis for improved consensus and coordination mechanisms. The project, implemented in two phases between 2006–2009, works by multiplying and distributing material to primary beneficiaries and then relies on subsequent farmer-to-farmer re-distribution. It is estimated that a minimum of 500 000 households have received improved vegetative material from nurseries in this programme. Furthermore, it is estimated that some 2 000 farmers, individually contracted or engaged in some form of Farmer Field School activity, now have the skills and knowledge to generate planting material.

b) The Great Lakes Cassava Initiative (GLCI), funded by the Bill and Melinda Gates Foundation and implemented by the Catholic Relief Services (CRS), addresses cassava disease in six countries. This programme (2008–2012) covers cooperative research into new varieties, surveillance in partnership with the IITA and also involves multiplication

and distribution of materials, together with communication and farmer awareness activities. By 2012, the programme aims to have provided resistant planting material to over 1.1 million households and transferred skills on disease identification.

c) The United States Agency for International Development is sponsoring a cassava project, implemented by the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA). This project (2008–2012) focuses on: (i) developing knowledge on CMV and CBSV diseases; (ii) developing multiplication system for generating quality material of improved varieties; (iii) building capacity on cassava production; (iv) supporting the development of policies and standards for cassava; and (v) scaling-up processing technologies.

d) An IITA project entitled "Integrated protection of cassava from emerging pests and diseases that threaten rural livelihoods", is meant to increase and sustain cassava productivity and improve livelihoods of farmers through the reduction of crop losses due to pests and diseases in sub-Saharan Africa (2007–2010). This project is sponsored by the International Fund for Agricultural Development.

e) The Common Market for Eastern and Southern Africa (COMESA) is also implementing a programme entitled the Cassava transformation in southern Africa (CATISA). It aims to analyse and help accelerate cassava commercialization in southern Africa in order to help improve food security in the region. CATISA focuses on the rapidly growing commercialization of cassava – an integrated food staple market-shed in which cassava commercialization offers significant potential for improving food security in drought prone areas in five countries, the Democratic Republic of the Congo, Malawi, Mozambique, Tanzania and Zambia. The programme budget of USD 2 million was complemented with start-up funds provided by the Swedish International Development Cooperation Agency.

There are several other local and international non-governmental organizations (NGOs) with varied range and scope of operations ranging from research to development and across districts of the same country to across countries.

The current emergency response strategy has significantly concentrated on large-scale multiplication and distribution of clean planting materials of improved (resistant or at the very least disease-tolerant) varieties, and awareness campaigns.

Even in the absence of total replacement of stocks with improved materials, this approach can work by introducing resistant or tolerant materials alongside traditionally-preferred but susceptible varieties. The result is then to reduce the level of infection and effectively "protect" preferred local varieties.

The programmes have deployed disease-tolerant varieties developed by IITA and tested by national programmes.

FOOD CHAIN CRISIS
Management Framework
Plant Protection

A crop of cassava that is resistant to the African cassava mosaic virus

Credit: FAO/ G. Napolitano