2. RESPONSE ANALYSIS: OPTIONS AND STRATEGY

Persistent conflict coupled with recurrent climatic events have rendered a significant proportion of Southern Sudan's population food insecure. Addressing this chronic challenge requires long-term engagement and concerted effort on the part of the Government and its partners with an emphasis on agricultural production and productivity.

The Government of Southern Sudan's Food and Agriculture Policy Framework (MAF, 2007) emphasizes the need for long-term engagement, while the Animal Resource Policy and Strategic Plan (MARF, 2006) focuses on addressing chronic developmental challenges facing Southern Sudan, while preparing for emergency situations. Therefore, interventions that aim to address food security should balance emergency response to save lives with longer-term recovery to mitigate food insecurity and ensure sustainable agricultural development. This PoA incorporates short- and medium-term interventions that would ensure increased production and productivity, which will eventually reduce vulnerability to food insecurity.

Since 2001, FAO's interventions in Southern Sudan have sought to save people's lives and livelihoods (by protecting them and their livelihoods during emergencies) and provide immediate assistance (during or immediately after a disaster). FAO's emergency interventions in Southern Sudan have tended to be dominated by seed distribution and animal health activities. The 2010–12 PoA will limit direct input transfers primarily to households that have lost a significant portion of their productive assets and who risk extreme poverty if not provided with the basic inputs required to enable them to resume production.

Geographically, it is anticipated that the response will continue to be important in Jonglei and Upper Nile, as well as other states in which asset stripping is strongly linked to displacement. The reasons for this strategy are detailed below. Through its activities, this PoA is adopting a DRM approach, whereby preparedness/mitigation and transition receive more attention than was previously the case. This adjusted strategy is a clear reflection of the current needs, as described in Section 1, as well as the likely scenario in 2010–12, and follows the twin-track approach being applied by FAO for food security.

The twin-track approach

Since 2002, FAO, WFP and the International Fund for Agricultural Development have been advocating a twin-track approach for hunger reduction. "The twin-track approach was designed for conducting both needs analysis and developing responses consistent with a rehabilitation or development perspective. Under track one, examples of response include improving the supply of food to the most vulnerable, reproducing locally improved seeds, enhancing income and other entitlements to food, re-establishing rural institutions, reintegrating refugees and displaced persons, and reviving access to credit and saving mechanisms. Under track two, the critical actions include re-establishing markets, providing food aid, cash transfers and social relief and rehabilitation programmes and contributing to peacebuilding efforts" (Flores, 2007). In practice, the twin-track approach ensures that the multidimensional aspects of food security are properly addressed and that long- and short-term food security problems are brought into the same framework.

This approach embraces the widely accepted World Food Summit (2006) definition that reinforces the multidimensional nature of food security and includes food access, availability, food use and stability. FAO's twin-track approach for fighting hunger combines sustainable agricultural and rural development with targeted programmes for enhancing direct access to food for those most in need.

Table 2 - The twin-track approach and the dimensions of food security

	Availability	Access	Stability
Track one: Rural development/ productivity enhancement	• Enhancing food supply to the most vulnerable. • Improving rural food production, especially of small-scale farmers. • Investing in rural infrastructure. • Investing in rural markets. • Revitalization of the livestock subsector. • Resource rehabilitation and conservation. • Enhancing income and other entitlements to food.	• Re-establishing rural institutions. • Enhancing access to assets. • Ensuring access to land. • Reviving rural financial systems. • Strengthening the labour market. • Mechanisms to ensure safe food. • Social rehabilitation programmes.	• Diversifying agriculture and employment. • Monitoring food security and vulnerability. • Dealing with the structural causes of food insecurity. • Reintegrating refugees and displaced people. • Developing risk analysis and management. • Reviving access to credit system and saving mechanisms.
Track two: Direct and immediate access to food	• Food aid. • Seed/input relief. • Restocking livestock capital. • Enabling market revival.	• Transfers: food/cash-based. • Asset redistribution. • Social relief, rehabilitation programmes. • Nutrition intervention programmes.	• Re-establishing social safety nets. • Monitoring immediate vulnerability and intervention impact. • Peacebuilding efforts.

2.1 Dwindling agricultural production

The decline in agricultural production is a real concern. Production can be improved through a variety of mechanisms: distribution of inputs; support to livelihoods diversification; technology transfer; promoting conservation agriculture (CA); and adapting strategies to climate change.

Direct input distribution

Seed and hand tools are basic inputs for agricultural production in all ten states of Southern Sudan. The FAO emergency and rehabilitation programme has been at the forefront in providing these much needed inputs. Over 250 000 returnees, IDP and vulnerable resident households received seed and tool assistance in 2008 and 2009. Emergency seed assistance contributed 51.6 percent and 53 percent of the total production of the crop types distributed to beneficiary households in 2008 and 2009, respectively. Although the average total production per household fell short of the annual household energy requirement by 4 to 5 months, production from the seeds provided by FAO alone was enough to sustain beneficiary households for more than four months. There is still a need for input distribution, especially in combination with measures that support the diversification of livelihoods.

Livelihoods diversification and technology transfer

Depending on their geographic location, households rely on one or more of the following livelihood activities: cattle rearing, crop production and fishing, with other activities (such as collecting wild food, hunting and trade) providing supplementary sources of food.

Crop production tends to be rainfed and is heavily dependent on climatic conditions, while livestock production is affected by disease outbreaks, drought and insecurity linked to cattle raiding. Fishing, too, is limited by poor access to appropriate fishing gear and high post-harvest losses.

Despite Southern Sudan's abundant water resources, there is still minimal small-scale irrigation during the dry season. Traditional hand irrigation is carried out in riverbeds during the dry season for tobacco and local vegetable crops. Beekeeping exists as an untapped potential activity that could offer families an alternative source of food. However, it is not widely practiced in Southern Sudan. Poultry production also tends to follow traditional practices, with limited productivity and resulting in high levels of imports from neighbouring countries. Prolonged conflict has left many returnees and IDPs with limited or no animals. There is a real need to provide targeted households with alternative livelihood options to increase their access to food.

Support to vegetable production and small-scale irrigation technology

Vegetable production is one of the most successful income-generating activities promoted by FAO in Southern Sudan. The short growing period for most vegetables provides families with a fast source of food and income (especially during lean periods), as well as a cheap source of vitamins (during the dry season).

FAO has been providing treadle pumps in areas along the Nile and Sobat Rivers, which pass through a number of states (Eastern and Central Equatoria, Jonglei and Upper Nile), and areas with high water tables (Northern Bahr el-Ghazal and Warrap) in support of dry-season vegetable production. Women and youth groups have been the main focus of these activities.

Vegetable production has become a stable source of income, particularly for returnees, women and young people. For example, the members of the Pacong Women's Vegetable Group in Rumbek East, which received assistance from FAO through Women for Women, now earn between USD 60 and USD 100 each per month. In Jonglei state, youth groups that received support from FAO and the SMoA have been practicing dry-season vegetable production for a number of years and now earn between USD 4 000 and USD 10 000 from each feddan of land planted, depending on the type of vegetables grown.

Conservation agriculture

CA aims to achieve sustainable and profitable agriculture and, therefore, improve farmers' livelihoods, through the application of three principles: minimal soil disturbance, permanent soil cover, and crop rotations. CA has tremendous

potential for all farm sizes and agro-ecological systems, but its adoption is perhaps most urgently required by smallholder farmers, especially those facing acute labour shortages. It combines profitable agricultural production with environmental concerns and sustainability and has been proven to work in a variety of agro-ecological zones and farming systems. Owing to its potential, FAO is actively promoting CA, which integrates different areas of technical expertise, and aims to facilitate its implementation throughout the Sudan as it impacts on a number of aspects linked to the decline in agricultural production.

In 2009, FAO introduced CA in order to minimize the environmental impact of conventional tillage using the mouldboard plough. Four sets of CA tools have been introduced and promoted: the Magoye ripper, animal-drawn direct planter, subsoiler and jab planter. Although it is still too early to determine the impact of CA at the household level, it has attracted considerable attention from other stakeholders (the Government and NGOs), as well as farmers, as it reduces the amount of labour required while minimizing environmental degradation.

Local organization for local souring of hand tools

In most of Southern Sudan, the majority of farming households use hand-held tools such as the African hoe (jembe) and flat-bladed, long-handled hoe (maloda). Evidence from a number of assessments indicates that 93 percent of farmers use traditional hand tools while the remainder use animal traction for land preparation (CFSAM, 2009). In 2009, approximately 60 percent of the hand tools and 95 percent of the ox-ploughs distributed to at-risk households in Southern Sudan were through the FAO programme. While all the jembe were sourced from outside the country, a significant proportion of malodas were procured through local blacksmiths. External procurement of malodas accounted for about 70 percent of those distributed to beneficiaries in 2008 and 2009. A total of 25 blacksmith organizations were involved in manufacturing malodas. They were initially provided with training and tools by FAO. In 2010, a similar approach will be extended to the production of ox-plough parts to ensure communities have access to ox-plough accessories in their own localities.

Supporting the production of local tools

In some parts of Southern Sudan, the maloda, a local hand tool for cultivation, is very much preferred. FAO has given significant support (inputs and training) to local blacksmiths to fabricate this tool. Local production and supply accounted for about 30 percent of the tools distributed by FAO in 2008 and 2009 which has reduced the need to source malodas outside Southern Sudan, as well as the cost and time to acquire these tools.

Blacksmithing is an income-generating activity that supports the livelihoods, not only of the blacksmith, but also of the farming communities receiving their products and services.

Promotion of animal traction to increase production

Animal traction in Southern Sudan dates back to the early 1970s. FAO is promoting it as the most appropriate technology to expand the area under production. A proportion of households in Southern Sudan have adopted animal traction, particularly

in Lakes and Warrap states. Through animal traction, the area under cultivation per household can be increased by between 4 and 8 feddans (a 100 to 400 percent rise compared with the use of hand tools), resulting in greater food production to meet household food needs and generate income through marketing the surplus. The local seed recollection programme has been targeting surplus production from those who use animal traction for cultivation.

Fisheries: an untapped resource

Fishing activities provide critical livelihoods support to many households along the Nile and Sobat Rivers and the numerous small water bodies (swamps, ponds, dams, streams and lakes) in Southern Sudan. Even the floods bring positive results in the form of abundant fishing. Southern Sudan has the potential to harvest 300 000 tonnes of fish from the Nile and other inland water resources. Currently, only 10 percent of this is fished in the rivers and swamps every year in Southern Sudan.

To support the communities along the main rivers and water bodies, FAO has been providing fishing kits with hooks and twines, ensuring that fishers have an adequate supply of protein as well as income from the sale of their catch. Many of beneficiaries have since abandoned traditional methods of using poisonous roots, fruits, barks, and wild onion for the indiscriminate killing of fish and other aquatic animals. This has had a significant impact on the aquatic environment and has helped fishers exploit aquatic resources in a sustainable manner.

Based on its considerable expertise and experience with fisheries, FAO has promoted the use of wooden, flat-bottom timber canoes instead of dug-out canoes through skills training in boat-making. Dug-out canoes are unstable, unsuited to some environments and waste wood (a tree per canoe), making them environmentally destructive. The promotion and adoption of modern canoes has significantly reduced the cutting down of big trees, particularly palm trees (by 50 percent), and reduced the threat to lives of the unstable dug-out. Training on net-braiding using spools and twines has provided a livelihood opportunity for disadvantaged members of the community, including disabled people and women, making them an integral part of Southern Sudan's small-scale fisheries.

A regular training programme for fishers has led to an increased local supply and availability of fish, which provide a cheap source of protein. Training in fish processing and preservation techniques has greatly reduced post-harvest losses by extending the shelf-life of products and reducing the damage caused by maggots and attacks by dermestid beetles.

Promoting adaptation strategies to climate change

Increased intensity and frequency of storms, drought and flooding, altered hydrological cycles and precipitation variance have implications for future food availability. Climate change and variability are among the most important challenges facing a number of countries in sub-Saharan Africa including Southern Sudan, where 90 percent of agricultural activity depends on rainfed production.

Given the changes in precipitation and hydrology, temperature, length of growing season and frequency of extreme weather events, actions are required to mitigate the impact of climate change on rural communities. Mechanisms such as farmers adapting to different rainfall patterns by changing the type of crop grown or using different harvesting and/or sowing dates will be tested and promoted among farming households.

Land tenure

As is the case elsewhere in sub-Saharan Africa, land tenure and access to natural resources are among the key structural factors contributing to poverty and outbreaks of violent conflict. Land is not just a means of survival or material gain, it has profound religious, cultural, social and political significance for people in Southern Sudan. Land is an extremely sensitive issue and was not addressed in depth during the negotiations that led to the signing of the CPA.

The majority of Southern Sudan's population depends on land and natural resources for its livelihood. Secure access to land for the rural poor is essential to the process of post-conflict recovery and promotion of sustainable rural development and, most importantly, food production at the community level. Improving people's knowledge of their land rights will make these rights real, allowing the right holders to invest in the land and improve their livelihoods. The land rights of the people of Southern Sudan have been guaranteed in the Interim Constitution of Southern Sudan (2005).

Secure land tenure in a post-conflict situation – particularly for poorer and more vulnerable groups – is key to poverty reduction and should be guaranteed through appropriate policies and legislations that protect the land rights of the poor. Women's tenure rights, which are often considered subservient to those of men, require particular attention. In Southern Sudan, as in other developing countries in Africa, women are the main users of land and play a key role in food production. Continued land tenure insecurity, due to prevailing customary norms and practices that discriminate against women, will profoundly affect household and community food security.

Food availaibility

The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports.

FAO Policy Brief on Food Security, 2006

Competition over access to and use of natural resources, particularly water and pasture land, is the main driver of inter- and intra-ethnic conflict. This is exacerbated by the growing population and impact of climate change-related events such as floods and drought, which have reduced the natural resources on which livelihoods depend, thereby intensifying competition over access. This can become violent and lead to the displacement of people from their sources of livelihood and destruction of their livelihood assets, compounding an already fragile food security situation. It is critical that mechanisms for resolving resource-based conflicts be supported to ensure the recovery and development of sustainable livelihoods.

FAO's suggested programme

Overall in Southern Sudan the priority is to increase agricultural production, learning from successful current practices described above and empowering target beneficiaries to apply alternative livelihood activities to increase their access to food. FAO will support the diversification of households' livelihoods through the promotion of technologies to enhance productivity like micro-irrigation for vegetable production, animal traction to expand cultivation, and alternative livelihood activities (such as poultry production and beekeeping) in targeted areas of Southern Sudan. The above will also improve households' resilience to disasters.

FAO will continue to support returnees, young people and women, particularly through vegetable production, which has proven to provide a stable source of income for many families. The distribution of vegetable seeds and hand tools (hoes, machetes, watering cans) to vulnerable households enables them to produce vegetables for their own consumption and for sale in local markets. FAO is promoting vegetable production in backyard gardens and small land areas to increase household food security.

Female-headed households and primary school teachers have been trained in vegetable and fruit production using locally available resources. This continued assistance will enable the beneficiaries to improve the nutritionals status and vitamin-intake of their children, as well as provide their families with a source of income long after project activities have finished. To supplement these interventions, FAO will continue to conduct training activities throughout Southern Sudan on the production, use and maintenance of treadle pumps in order to encourage non-rainfed farming methods and CA techniques.

The immediate objectives of FAO's fisheries interventions are to acquire, distribute and make available fishing equipment to the primarily subsistence-oriented fishing communities. This will increase fish catches for human consumption, re-establish coping mechanisms, raise the amount of income generated, and improve communities' absorption and reintegration of returnees.

FAO uses a two-pronged approach for its fisheries activities:

1. It increases the availability and home consumption of fish proteins by making available essential fishing equipment (hooks, twines and floaters), with the objective of reaching IDPs, returnees and host communities in selected areas of Southern Sudan.
2. It trains beneficiaries in improved fish processing techniques, net-making and boat-building. This aims to train and expose beneficiaries to new techniques and skills in fisheries.

Efforts to adapt to climate change through an integrated approach to land and water management to secure sustainable development and food security will be promoted among rural farming communities in Southern Sudan. The following approaches will be adopted for activities related to land tenure and the resolution of land- and natural resource-based

conflicts: (i) implementing tested methodologies for community land-use planning, natural resource management and stakeholder dialogue on land tenure issues; (ii) carrying out studies on customary land tenure and conflicts in selected conflict-affected areas; (iii) promoting the alternative dispute resolution (ADR) mechanism for land-based conflicts; and (iv) mapping/GIS of water for livestock resource development, traditional range use and management, and institutional capacity development in land administration, policy and law development.

2.2 Reduced food accessibility

Since the signing of the CPA in 2005, the general food-security situation in Southern Sudan has improved. The average yield estimate for traditional cereal production was 24 percent higher in 2008 than in 2007 (CFSAM, 2009). Similar improvements were noted by partners in the production and yield of legumes, oil crops, and roots and tubers. However, these are threatened by poor post-production techniques for processing, handling and storage. While 2008 did see a better performance in cereal production, there was a 20 percent fall attributed to post-harvest losses.

Improved processing and post-harvest handling

Post-harvest losses, in quantity or quality, should be minimized if improved crop performance is to be translated into greater food security. Quantity losses can occur as a result of inconsistent harvest methods, spillage during transportation, or damage by pests causing reductions in weight or volume. Quality losses can occur as a result of poor processing, drying and storage methods. This can lead to changes in colour, smell or taste; contamination by toxins, pathogens, insects or rodent excreta; a reduction in nutritional value; or a loss of viability if the harvest is meant to be used as seed.

FAO has been promoting improved post-harvest and processing technologies. In Magwi county (Eastern Equatoria state), FAO introduced motorized cassava chippers and improved drying methods. This drastically reduced labour requirements, increased output (800 to 1 000 kg of fresh cassava chipped in an hour), and shortened the cassava drying time from 5 to 7 days (with traditional methods) to 1 to 2 days depending on the weather, thereby reducing the time required for women to attend to the cassava during drying. Above all, there has been a significant improvement in the quality (pure white) of the product (cassava chips) compared with the discoloured and often mouldy cassava chips prepared in traditional ways.

Conditional and unconditional livelihood resource transfers

Critical acute food insecurity was forecast for 2009 and beyond owing to the failure of the main season's rains in most areas. Widespread ethnic conflict and LRA attacks in 2009 made a fragile food security situation worse. The cycle of violence and displacement and erratic rainfall are likely to continue in 2010 and beyond. In this scenario, appropriate DRR measures will be required to address critical food gaps and protect the lives and livelihoods of vulnerable communities. FAO's approach will include directing several interventions (distribution of seeds and tools, access to cash-for-work opportunities and training in community-based disaster risk mitigation) to stabilize food availability for the most at-risk households.

Markets

Markets must function effectively in order to achieve food security and economic growth. However, protracted conflict has meant that markets in Southern Sudan have not functioned for decades. A lack of infrastructure, insecurity, absence of an information system, lack of market extension, absence of transport and other factors have resulted in inefficient markets and led to dependence on imports from North Sudan and neighbouring countries. Following the signing of the CPA and relative peace since in Southern Sudan, there have been signs that markets are improving. Despite this, markets remain under-developed and reliance on the import of food and other commodities continues to be a key challenge facing Southern Sudan.

Effective macro, trade and agricultural policies are required to stimulate market development, revitalize local production and gradually reduce dependence on imports. A reliable and timely market information system is of critical importance for producers, traders, consumers and policy-makers to enable them to make informed business and policy decisions. The Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA) has recently established a pilot market information system in Southern Sudan, which covers markets in the ten state capitals. Real-time price information for major crops, livestock and fisheries products is being made available online and will soon be available in SMS form. This pilot market information system covers only a limited number of markets and commodities owing to a lack of financial and human resource support to the Government of Southern Sudan and state counterparts.

Therefore, significant investment is needed to increase the technical knowledge of Government counterparts, and scale up and out the system's coverage in order to provide comprehensive information to a wide range of stakeholders. Market information, in addition to facilitating trade and stimulating markets, will enable the Government, donors and other development and humanitarian partners to plan, implement and monitor appropriate policies, strategies and programmes for economic growth.

FAO's suggested programme

For current and future programming, the aim is to tackle the root causes of food insecurity – this means promoting not only productivity growth but also activities that target access issues. FAO's suggested programme aims to include interventions (distribution of seeds and tools, access to cash-for-work opportunities and training in community-based disaster risk mitigation) to increase households' access to inputs and ways to increase income diversification. This will help stabilize access for poor households to the minimum food basket.

The proposed FAO intervention will also focus on minimizing losses arising from poor post-harvest handling. The programme aims to promote appropriate post-harvest techniques (drying, processing and storage) in all ten states of Southern Sudan, and will target extension agents, local artisans (blacksmiths) and farming households. The intervention envisages a wide adoption of improved post-harvest handling techniques and a storage system that will reduce the current level of post-harvest losses (20 percent) to less than 10 percent, thereby further improving food security in Southern Sudan.

A functioning market information system covering major commodities and markets in Southern Sudan is vital to ensure the improved functioning of rural and urban markets, and greater market transparency and efficiency. FAO will support the process of consolidating the collection and analysis of market information in the Government of Southern Sudan and the ten states.

2.3 Food production

Extension services

At present, the Government lacks the capacity or capability to provide extension, research, financial services and marketing support to farmers. Almost all the inputs and limited technical service backstopping that has been available over the last two decades has been associated with the relief effort, including the provision of seeds, tools, animal health services, fishing equipment and training, by international agencies, donors and NGOs. These activities were often provided as a supplement to food distribution interventions. Over the last few years, these organizations have increasingly focused on longer-term development rather than just emergency response. Some progress has been made, particularly in the introduction of properly tested seeds, ox-plough cultivation, improved tools and the piloting of micro-credit approaches and agribusiness initiatives. However, few of these interventions have involved any significant consultation with or participation of the recipients. Experiences and results with agricultural advisory services have been limited to interventions by NGOs and UN agencies such as FAO.

Farming systems in Southern Sudan comprise a mixture of crop and livestock production, fishing and forestry activities. Productivity is very low in the crop and livestock subsectors owing to inappropriate and inefficient farming practices, declining soil fertility, low quality seeds, animal health problems, lack of vaccination services, lack of effective extension services, and the inadequate or lack of involvement of non-state actors. Extension services are so weak that there are virtually no services available at and below the county level. In areas where such services are available, they tend to be top-down and based on "delivery", with farmers seen as passive beneficiaries with no role in decision-making.

With the relative peace in Southern Sudan, the Government is committed to formulating agricultural and livestock extension services that are inclusive and participatory and that promote the empowerment of small-scale farmers to enable them to meet their specific needs based on their own priorities. Farmer Field Schools (FFS) and grassroots services through community animal health workers (CAHWs) have been seen as key mechanisms to promote group-based, inclusive and participatory approaches to address livelihood (crop, livestock, fisheries, forestry) needs based on farmers' needs and priorities and to strengthen grassroots services for these subsectors.

First tested in Indonesia, as Sekolah Lapangan, with FAO's support, the FFS have proven to be an effective means of providing technical support and building farmers' capacity. Farmers generate knowledge that is functional and necessary to improve their production and livelihood potential. It also helps to empower farmers as they are both the users and owners of the knowledge.

Similarly, in Southern Sudan, community-based animal health service provision was developed, applied and championed through the CAHWs network during the conflict. This proved to be a highly effective tool for the eradication of rinderpest in Southern Sudan and provided much-needed animal health services at the community level. However, after the signing

of the CPA and establishment of the Government, donor support to the CAHW system has almost completely disappeared, creating a vacuum between service providers and livestock farmers. Of nearly 4 000 trained CAHWs, only about half are functioning and they urgently need refresher training, basic tools and veterinary kits. Cold chain facilities, which are vital for sustained animal health service provision, have deteriorated, making vaccination programmes difficult.

Seed system security assessment (SSSA)

Seeds are the basic inputs in agricultural production and are a central part of farmers' lives worldwide. In Southern Sudan, farmers normally obtain the seeds they need from various sources such as seed selected from grain; exchanged, bought, borrowed or received as a gift from neighbouring families, friends or in-laws; and from emergency, rehabilitation and development interventions. Farming families are seed secure when they have access to seed (and planting material) of adequate quantity, acceptable quality and in time for planting. Seed security is best framed within the broader context of food and livelihood security. Helping farmers to obtain the planting materials they need will enable them to produce both for their own consumption and for income generation.

Achieving seed security is quite different from attaining food security, despite their obvious links. One can have enough seed to sow a plot but lack sufficient food to eat, for example during the lean period prior to harvest. Conversely, a household can have adequate food but lack access to appropriate seeds for planting. In the latter case, a family may have plenty of grain suitable for food but not as seed or may lack access to the desired varieties. Despite the clear differences between food security and seed security, determinations of the seed-security situation in Southern Sudan have been largely based, implicitly or explicitly, on needs and livelihood assessments or CFSAM (the former led by WFP and the latter by FAO and partners). These have a broader scope of needs for cereal and a very limited scope for seed security or seed systems.

Understanding what happens to seed systems during or after disaster has become markedly more refined in other countries, providing greater insight into seed-security constraints, which are key to agriculture sector recovery and development. Analyses have shown that seed systems need to be analysed to gear appropriate seed-related responses: seed systems, farming systems, markets and livelihood systems. A comprehensive SSSA will therefore offer an opportunity to review the functioning of seed systems in the formal and informal sectors and promote strategic thinking about the relief-recovery-development continuum in order to effectively respond to seed insecurity in Southern Sudan.

Community-based seed production and supply

Emergency seed interventions have been implemented in Southern Sudan for over a decade. FAO's ERCU has been at the forefront in providing much-needed seeds to returnee, IDP and vulnerable resident households. No formal seed production, and therefore no certified seed production, exists in Southern Sudan. Initially, the bulk of emergency seed aid was procured outside Southern Sudan, mainly from Kenya, Uganda and North Sudan.

To minimize reliance on international procurement, FAO initiated a community-based seed production project, which empowered local communities to produce quality seed for their own use and for sale in potential markets. The project built the capacity of both extension agents and farmers in five states of Southern Sudan. Significantly, the quality of some crop seeds and planting materials (groundnut, bean and cassava) produced improved. Laboratory seed tests showed an improved germination of maize (98 to 100 percent), beans (86 to 90 percent) and groundnut (86 to 100 percent), while field monitoring data indicated a reduced incidence (less than 5 percent) of CMV-affected plants in multiplication fields with improved cassava varieties.

For the first 2010 cropping season, seeds produced by local farmers contributed over 400 tonnes of quality seeds of adapted crop varieties to the emergency seed aid (90 tonnes) through seed recollection (350 tonnes) for general distribution or input and seed trade fairs. This significantly contributed to the reduction in seed imports, and partly addressed concerns about adaptability and aspects of seed quality.

Since 2000, FAO has been supporting agricultural production by providing seeds, hand tools and animal traction equipment; fisheries production through distributing fishing gear; and livestock production by supplying vaccines and drugs and supporting the cold chain system throughout Southern Sudan. More than five years ago, most of the inputs distributed by FAO were externally sourced. However, this has begun to change with the proportion of seeds sourced locally reaching 60 percent of all seeds supplied in 2009. FAO works with a number of local organizations to source local seeds and tools for stocks to facilitate the emergency provision of these items to different locations in Southern Sudan.

Cassava as a famine reserve crop

Cassava is a staple food in the greater Equatoria region of Southern Sudan. The population's food security, which depends on this crop, was threatened by the introduction of CMV in the region. FAO supported the multiplication, promotion and adoption of improved, high yielding, disease-resistant varieties of cassava in the region. This has resulted in reduced prevalence and incidence of the disease and restored the food security of communities growing cassava as a staple crop.

Local organization for seed re-collection

The majority of seeds were sourced externally due to the absence of formal seed production systems in Southern Sudan. Over the last five years, FAO has worked closely with various partners to source seeds of locally adapted crop varieties through seed re-collection programmes in which seeds are purchased from local farmers.

In 2009, some 25 organizations were subcontracted to re-collect seeds. Of these, 20 were local and 5 were international organizations. They were subcontracted through Letters of Agreement that detailed the activities to be carried out, including type and quantity of seeds to be re-collected, the re-collection points and the destination of the seeds. These partners worked closely with farmers' organizations, and with an expert or extension agent from the SMoA to identify good seed producers and growers (preferably ones previously provided with good quality seed by FAO). In addition, they organized seed quality testing. The re-collection and bagging of the seeds were done once the quality of the seeds was certified by a competent authority (in this case, SMoA officials). This resulted in the re-collection and redistribution of 350 tonnes of seeds in 2009.

Seed production, re-collection and seed fairs

The community-based seed production and supply initiative broadened the scope of seed/food security and provided an opportunity for: (i) developing the seed sector; (ii) reducing seed imports by 42.7 percent in 2008 and 54.7 percent in 2009; and (iii) ensuring that quality seeds of locally adapted crop varieties were available to populations that needed them. In 2009, some 800 farmers trained in seed production were able to produce 500 tonnes of seeds, of which about 300 tonnes were channelled into the general seed assistance and about 90 tonnes were absorbed into seed fairs in 2010.

The seed and input trade fair (ITF) approach adopted in some states has encouraged seed growers to practice market-oriented seed production, with cash received during these fairs acting as a massive incentive. This has been one of the most appropriate strategies to reach those in need of seed aid, particularly in locations where seeds are available but access for some members of the community (especially IDPs and returnees) is difficult.

Livestock productivity

Southern Sudan has an estimated 8 million head of cattle and the contribution of livestock to pastoral and agropastoral communities cannot be underestimated. Given the significant herds of animals and nomadic lifestyle of pastoral communities, livestock production faces considerable challenges related to disease or socially- and politically-motivated conflict over resources. Livestock owners have limited access to veterinary services and are, therefore, at risk of losing a vital asset or failing to realize the full potential of their animals.

To overcome this, FAO has been training local populations on basic veterinary principles through the CAHW programme. CAHWs are trained and equipped to diagnose, prevent and treat the main livestock diseases in their communities. They also disseminate relevant extension information regarding improving livestock production and husbandry. FAO, through its network of partners, has trained and equipped over 170 CAHWs in the last two years. This has broadened the scope of disease surveillance and provision of animal health services to communities in need of support. Although the prevalence of a number of diseases remains high, there has been significant progress made in reducing morbidity and mortality among animals through control and preventative measures such as vaccination and treatment.

FAO has also been providing vaccines and veterinary drugs through its partners and MARF. The Organization supports a well-established cold chain network to ensure the viability of drugs and vaccines in about 120 strategic locations across Southern Sudan. The vaccination programme has helped to reduce the risk of disease for 30 percent of Southern Sudan's livestock population.

In addition, FAO has played a central role in ensuring that animal products (meat, milk, blood, etc.) are safe for human consumption. Slaughter slabs have been constructed in major towns, including Torit, Kapoeta, Kyala, Aweil, Kuajok, Gogrial, Akon and others, with support from FAO. Meat inspectors have also been trained and have contributed to a reduced risk of animal diseases spreading among consumers.

Integrated pest and disease management (IPDM)

The prevalence of pests and diseases has significantly limited the attainment of higher yields in all crops, but particularly with vegetables, where losses of up to 100 percent have been reported. As noted in the 2008 CFSAM, the prevalence of pests and diseases is attributed to a lack of crop protection extension services and, therefore, lack of access to information and inputs for pest and disease management among farmers. While the Government has restricted the use of inorganic chemicals, including pesticides, the threat to agriculture from pests and diseases remains high owing to the absence of appropriate strategies and alternatives for pest and disease control.

FAO's suggested programme

FAO plans to establish 1 000 FFS (200 per state) and continue ongoing activities. Training of trainers' sessions will be organized, particularly to engage NGOs and CBOs in the FFS methodology. Refresher training will be conducted for CAHWs and revolving funds set up to support veterinary pharmacies.

Community-based seed production and supply initiatives and ITF approaches will continue to be promoted throughout 2011 and an SSSA will be carried out to strengthen understanding of seed security in Southern Sudan.

FAO will support the Government in consolidating and strengthening existing animal health coordination mechanisms to ensure the most effective outcomes of overall livestock development assistance. Management of the existing cold chain system for vaccine storage will be reinforced through the procurement of fridges, vaccine carriers, cool boxes and moving spare parts for facilities. In addition, appropriate vaccines will be procured and distributed to different locations. FAO will also support the newly-established laboratories in MARF through procuring equipment and reagents. Assistance will also be provided in developing the capacity of laboratory staff through technical and specialized training, and strengthening the surveillance and control of transboundary animal diseases (TADs), including emerging zoonotic diseases such as H5N1 Highly Pathogenic Avian Influenza (HPAI), H1N1 and Rift Valley fever (RVF).

An IPDM strategy will be adopted to coordinate economically and environmentally acceptable methods of pest control with the judicious and minimal use of toxic pesticides. This will involve a range of activities including the careful assessment of local conditions (such as climate, crop characteristics, agricultural practices, soil quality and Government regulations). The goal of this is to maintain the current minimal use of chemicals in crop production, while keeping pests and diseases to an economically manageable level. The safe use of chemicals in some circumstances, such as vegetable production, will be promoted through training farmers and dialogue with MAF on the safe use of toxic chemicals to control pests and diseases of economic importance.

2.4 Cross-cutting activities

FAO will also pay close attention to three cross-cutting issues that affect food security and livelihoods in Southern Sudan.

Early warning systems

The definition of an early warning system depends on the purpose of the system, its institutional structure and role, the scope of activities and the type of information products produced. Many systems focus on agroclimatic and food supply monitoring, while others are developed in the context of DRR/M (International Strategy for Disaster Reduction, 2002). A comprehensive early warning system covers aspects of food security that examine supply, access and nutrition, and after rigorous analysis provides information to warn a country months in advance of a serious impending food-insecurity situation. Such systems seek to help prevent or respond to food insecurity by providing decision-makers with specific information about hazard conditions or declining crop yields, based on the assessment. The establishment of a demand-driven system is critical to the effectiveness and long-term sustainability of an early warning system.

In the 1990s, early warning systems tended to focus on rainfall and vegetation and forecast expected agricultural production. Food security has become much more complex and to provide reliable early warning information based on which decisions can be made, food security analysts need to combine agricultural production maps, data and satellite imagery with local market prices and trade inflows and outflows, and information about local livelihoods in order to determine what can be purchased locally, what can be brought in and what people can afford.

The SIFSIA programme was designed to establish an information system for food security in Southern Sudan. During the inception period, it became clear that the programme design did not allocate resources for the states from which the food security information would be collected. After the mid-term review, there was a strong recommendation that resources be allocated to the states for food security data collection. SIFSIA re-allocated some resources to the states, but this has not been sufficient. The current livelihood information and livelihood zones were developed many years ago and should be reviewed as livelihood sources have changed considerably in the context of relative peace. This is critical for a proper understanding of food insecurity and vulnerability.

Agricultural statistics

With market-related activities being developed, there is an urgent need to build the states' capacity to generate agricultural statistics and realize their full potential. Currently, agricultural statistics in Southern Sudan are generated by the WFP/FAO CFSAM and presented as combined cereals, without disaggregating individual crops. It is known that procuring agricultural produce from rural communities empowers these communities. However, if this is done without clear information on quantities being produced in particular localities, this could push communities into food insecurity as all their production could be purchased and shipped to other regions.

Nutrition

Agriculture and food security interventions have a key role to play in improving nutrition. However, this impact must be fostered by ensuring programmes are designed to target and meet the nutritional needs of vulnerable households. These households must be given the skills to make the best use possible of the food and income resources they have; and appropriate linkages must be made to relevant interventions in other sectors such as health, education and social protection.

Building the capacity of local stakeholders, including government institutions, CSOs and NGOs to design, implement and evaluate integrated interventions that lead to sustainable food and nutrition security is central to linking relief and development and to DRM and thus the achievement of FAO's SOI.

FAO's suggested programme

There is a need to address cross-cutting issues that take into account national and international policies and issues that affect the public sector, coordination of the Food Security and Livelihoods (FSL) Cluster and countrywide measures that support peace and security.

FAO will build on existing food security information activities, taking into account critical partnerships in data collection and food security analysis, which have been shown to help overcome human resource constraints, improve the quality of analysis and strengthen capacity. In this context, the Government of Southern Sudan will work with development partners, NGOs and universities. Extensive capacity building will be conducted in the five states because the way in which information is collected, analysed and disseminated is critical to its use in decision-making and supporting timely national responses to transitory food and nutrition crises. The early warning system will be part of an expanded food security information

and analysis system and will be enhanced to produce viable, relevant and credible information for use in responding to short-term emergencies, as well as contributing to longer-term development programming.

The programme will build on existing SIFSIA activities, taking into account critical partnerships in data collection for agricultural statistics and analysis, which have been shown to help overcome human resource constraints, improve the quality of analysis and strengthen capacity. In this context, the Government of Southern Sudan will work with development partners, NGOs and universities. Extensive capacity building will be conducted in five states (Western and Central Equatoria, Western and Northern Bahr el-Ghazal and Upper Nile) to standardize agricultural production data collection methodologies. Similar methodologies for data collection, analysis and dissemination are critical for decision-making and stimulating market response. Agricultural statistics data collection will be part of the SIFSIA food security information and analysis system and will assist in empowering communities through credible information systems, which highlight the potential of the indicated states as a source of agricultural produce without jeopardizing the food security of farming communities.

A multisectoral response integrating sustainable supply of, and access to, nutritious and safe foods, with appropriate health and care is required to protect and promote nutrition in the Sudan. This will be done through active participation in relevant policy-making and programming exercises to ensure nutrition is effectively addressed by the FSL Cluster, and training of partners on how to integrate nutrition aspects in their food security and livelihoods work.

2.5 Cross-cutting themes

As well as the issues highlighted in the previous section, a number of themes cut across FAO's planned programme for Southern Sudan, including: (i) continued support to the FSL Cluster; (ii) continued support at the institutional and decision-makers levels; (iii) gender issues; and (iv) a continued effort to support peacebuilding.

Support to the FSL Cluster

The FSL Cluster has been operational in Southern Sudan since 2004. It is co-led by FAO and WFP and has a strategic focus on preparedness and response to food-security emergencies. Coordination of the sector is an overarching strategy ensuring coordinated planning and response, better reporting and partnerships. FAO has been facilitating the coordination process, which has resulted in improved sharing of information, coordinated response to food-security emergencies and better partnerships.

In the current context of food insecurity and extended food gaps, increased grain prices and poor terms of trade, the strategic focus of the Cluster is to provide appropriate humanitarian packages to vulnerable individuals and households in the form of food assistance, agriculture and livelihoods start-up kits, and resource transfers in order to protect and restore their food security. The Cluster also supports preparedness and response to TADs by enhancing the capacity of Government institutions

and community groups to provide agricultural and livelihood support services. Coordination will help build synergy among partners, identify gaps and prevent the overlap and duplication of interventions.

The FSL Cluster continues to play a vital role in improving the livelihoods and food security of vulnerable groups such as returnees, IDPs and poor households throughout Southern Sudan. It also plays an important role in improving access to agricultural inputs, particularly crop seeds and tools to facilitate food production, fishing gear to improve catches, and vegetable seeds for better production, with fishing and vegetable production important alternative livelihood activities for returnees and other at-risk households.

FAO will continue to provide leadership in coordination, which is necessary to determine the available response capacity and requirements; allocate scarce resources where they are needed most; start or further develop new partnership relationships; determine who should be involved in what and when; and increase a sense of commitment to shared goals and greater continuity/cohesiveness.

Support at the institutional and decision-makers level

Risk reduction in agriculture requires appropriate sector policy frameworks and institutional mechanisms, sustainable natural resource management practices and the identification, adaptation and dissemination of targeted technical and structural mitigation measures. Through the implementation of the SIFSIA, FAO is already involved in strengthening policy and planning initiatives related to food security and market information systems. However, more needs to be done in early warning in order for it to be effective and ensure risk reduction in the agriculture sector. FAO also recognizes that contingency plans at different levels must be complementary and appropriate linkages established for coordination and to support action along clear lines of command.

The Government of Southern Sudan and its development partners are trying to ensure some linkage between FSL stakeholders through the Budget Sector Working Group. Furthermore, FAO and WFP co-chair with the Government the FSL Cluster coordination both at the national and state levels where stakeholders meet and exchange information regarding food security and livelihoods.

The Government recently established the Southern Sudan Food Security Council (FSC) chaired by the President of the Government of Southern Sudan to lead policy issues relating to food security at the highest level. The Government also established the Food Security Technical Secretariat (FSTS) with support from the European Union (EU)-funded SIFSIA programme currently being executed by FAO. Further technical and financial support is required to strengthen the capacity of the various institutions including the ministries/commissions, FSTS and FSC if food security is to be addressed in a meaningful manner. In addition, substantial institutional capacity building is required at the state level to deal with food insecurity effectively. Food security responses by the Government and partners will need to consider the traditional

institutions during the planning and executions of interventions. Therefore, concerted efforts on the part of the Government and its development partners are needed to support community-level institutions if food security interventions are to be effective.

Gender

Although women in Southern Sudan constitute the majority of subsistence farmers and perform most of the agricultural tasks, their access to knowledge and training programmes for effective farming practices and crop production, and linkage to resources and markets is very limited and not formalized as a policy. Current interventions conducted by FAO, such as seed distribution and agricultural training programmes have had success reaching women generally; however, efforts to specifically address gender issues need to be increased.

In addition, owing to cultural and traditional practices and legal restrictions, most women in Southern Sudan have very limited access to and control over land and resources. Farming decisions are made by husbands or male family members. In most cases, the little money gained from the sale of produce is taken by men and does not necessarily trickle down to the benefit of all household members. This threatens the sustainability and productivity of agriculture, as well as household food security.

There exists very limited diversification of household incomes and most women do not have the skills and means to work beyond household-level agricultural production. Owing to limited or no access to collateral security such as land, it is difficult for women to access loans for start up endeavours. Even if such access were available, there are very few women with sufficient education, technical skills, time or mobility to secure enough capital to pursue investment opportunities in micro-enterprise activities, which pose serious challenges to the diversification of livelihood activities.

Given this socio-economic context, understanding how men and women experience and respond to the current situation in Southern Sudan, and assessing their capacity for recovery, is essential to ensure effective emergency relief operations and rehabilitation in the framework of the PoA.

Women continue to be a group to which FAO wishes to give priority, and in order to respond effectively, our progammes will systematically incorporate the use of socio-economic and gender analysis tools to identify the most vulnerable communities. FAO will aim to be more systematic in the inclusion of women in food security- and agriculture-related activities, especially at the inception of new activities and programmes.

More rigorous efforts will be made to facilitate the more active involvement of women in the planning and ensure gender disaggregated data is obtained to adequately monitor the impact of activities.

Peacebuilding in the centre of FAO's programming

The signing of the CPA in 2005 brought unprecedented opportunities, as well as challenges, for the people of the Sudan and their international partners for consolidating the peace and improving the national humanitarian and development situation. The CPA provided for a six-year period during which national elections and a referendum on self-determination for Southern Sudan were to be held. The CPA lays the foundation for solidifying the peace and delivering peace dividends. Now, at a crucial juncture of the implementation of the CPA, Southern Sudan faces a range of governance, human security and economic recovery challenges. Particularly in the build up to the referendum, Southern Sudan is experiencing mounting instability and high levels of food insecurity and malnutrition. These continue to hamper the building of a just and prosperous peace for all citizens.

Consolidating peace is also an overarching goal of the UNDAF 2009–12, to which FAO is committed to contribute. Under the UNDAF, it was noted that a "climate of instability and competition, often over scarce natural resources, has been at the core of the challenge to peacebuilding in Sudan. In the PoA, FAO intends to make more explicit its efforts to articulate the Organization's contribution, particularly to support the peace, building national stakeholders' capacities to enable them to resolve disputes over land ownership and use, seasonal routes for livestock, and access to grazing land and water, while simultaneously identifying opportunities for dialogue around development opportunities.