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Supporting conflict-resilient food systems in Sudan

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Executive summary

Since April 2023, the conflict in Sudan has caused widespread devastation to social, economic and agricultural infrastructure, leading to a severe food crisis. Direct impacts include the displacement of farmers, destruction of crops and looting of agricultural goods. Indirectly, the conflict has disrupted value chains for agricultural inputs, decimated access to finance, reduced investment willingness and increased market instability. Long-standing systemic issues, such as environmental degradation, inequitable resource distribution and poor infrastructure had already led to poor yields, low rural development and systemic hunger – even before the conflict.

Humanitarian groups and their partners must act immediately to support Sudanese food systems to reduce the scale and length of the famine. Relief efforts should focus on distributing essential agricultural inputs, providing financial support through cash transfers where possible, and delivering targeted food aid. Simultaneously, productivity and systemic flexibility to withstand both conflict and environmental shocks must be improved by the aid sector through supporting decentralisation, environmental restoration and local production of important agricultural inputs. The integration of a conflict-sensitive lens is necessary to ensure that support activities do not contribute to either local-level conflict or serve the interests of groups involved in the conflict.

Through these efforts, humanitarian organisations can support food security in Sudan in the short term, while laying the foundations for a more prosperous and secure country in the future.

Key recommendations for aid actors

- a. Support for Sudan's food systems must be guided by a longer term perspective and strategy despite the current acute food insecurity to overcome long-term systemic issues.
- b. Aid organisations and donors need to build flexibility to their implementation and funding arrangements to effectively react to changes in the dynamic and fluid situation.
- c. Support for food production must prioritise localised and decentralised systems and producers to improve conflict and environmental resilience as well as to build productivity sustainably.
- d. The famine response must address all food production systems in Sudan, recognising that each presents unique conflict-sensitivity challenges and opportunities that can either drive conflict or help communities thrive. Pastoralism has too often been neglected by the aid sector, which is detrimental to both food security and peacebuilding efforts.
- e. Rapidly scaling up food production is both crucial and risky as conflict actors may be well positioned to benefit from these efforts. This requires a careful assessment of trade-offs and a commitment to strong, principled guidelines, and highly contextualised analysis.
- f. Land is a long-running driver of conflict in Sudan. Immediate actions on food security should be paired with long-term strategies for land reform and natural resource management.

Introduction

Since April 2023, the conflict in Sudan has engulfed large parts of the country, including the capital Khartoum, causing massive devastation to social, economic and livelihood infrastructure. The main warring parties are the Sudan Armed Forces (SAF) led by Lt. General Abdelfattah al-Burhan and the paramilitary Rapid Support Forces (RSF) under General Mohamed Hamdan Dagalo (Hemedti), but the war has drawn previous armed groups such as the Sudan People's Liberation Movement – North (SPLM-N) under Abdelaziz al-Hilu, the Sudan Liberation Army (SLA-MM) under Minni Minnawi into active combat. Combat has been seen in large parts of the country and the frontlines remain dynamic. The fighting has directly and indirectly impacted the availability, accessibility and affordability of food and goods, and the inputs required for producing, processing and distributing food in Sudan. This includes:

Direct impacts

- a. displacement of farmers
- b. insecurity-driven lack of access to farmland
- c. impeded pastoral mobility
- d. looting of agricultural goods and stores
- e. purposeful destruction of unharvested or harvested crops
- f. looting of financial institutions that support agricultural producers

Indirect impacts

- a. input value-chain disruptions, including limited imports (of fuel, fertilisers, improved seeds, etc.), leading to poor availability and soaring costs
- b. displacement-induced lack of land access and labour
- c. poor access to finance, including loans and money withdrawals
- d. disruptions of transport and market demand
- e. reduced purchasing power
- f. uncertainty and instability

With the fighting in Sudan in its second year, the country is beginning to experience catastrophic hunger, with potentially the worst famine since the 1980s underway. The ongoing fighting further threatens the second growing season in a row, with a cascading food system breakdown probable. With limited resources, bureaucratic hindrances, security threats and capacity challenges, the aid system is not prepared to handle the scale and severity of the crisis.

The conflict has also exposed the long-term issues at the heart of Sudan's food systems. For decades, these issues have left millions in chronic food insecurity, stifled rural development, fed an oligarchic political economy and destroyed previously thriving ecosystems. The disruption to the system that perpetuates these

dynamics creates an opportunity to build a more resilient and environmentally friendly food system, with strong productive capacity and an equitable distribution of benefits that can have positive impacts far beyond the conflict period.

In the context of a large influx of food security experts and humanitarian personnel and donors designing programmes to respond to the famine in Sudan, this paper outlines the long-term challenges at the heart of Sudan's food systems and lays out concrete steps to support a more equitable and sustainable food system as part of the famine response.¹

Background and context

The acute food security crisis was brought on by the 2023/24 agricultural season, which saw significantly below-average food production (40 per cent below the 5-year average according to the Crop and Food Security Assessment Mechanism [CFSAM]). With only 4.1 million metric tons (MT) of cereals produced, a cereal deficit of 3.7 million MT needs to be met by different means. With close to 1.7 million MT of this deficit existing in the conflict-torn, long-suffering and logistically difficult Greater Darfur and Kordofan regions, the threat of calamitous famine is present already this year. With ballooning prices for food produce and people's growing reliance on coping strategies, it appears this threat is quickly materialising.^{2,3}

While devastating in the near term, the situation can continue to deteriorate significantly in the coming years if the 2024/25 season also fails. The conflict has led to lower household resilience due to significant asset depletion, minimal access to livelihoods, bodies weakened by cumulative caloric deficiency and a withdrawal of investment capital. A large amount of Sudan's agribusiness and processing capacity has been destroyed or suspended.⁴ Many farmers have been displaced and were not able to cultivate in the previous season.⁵ Widespread famine conditions may also lead to further collapse of seed supplies and market structures due to both availability and affordability issues. Meanwhile, aid remains both insufficient in scale and constrained by bureaucratic impediments and security concerns in practice.

However, despite the seriousness of the most urgent issues, it is equally vital for the long term that the aid sector should consider and address the weaknesses of the food systems that existed before the onset of the current conflict. The importance of the agricultural sector to the national economy and people is massive, as it comprises an estimated 16 per cent of gross domestic product (GDP) and employs around 65 per cent of the population. It has also been a long-standing (if not consistent) priority for the government, with aspirations to make Sudan a 'breadbasket' for the region.⁶

"despite the seriousness of the most urgent issues, it is equally vital for the long term that the aid sector should consider and address the weaknesses of the food systems that existed before the onset of the current conflict"

The food system suffers multiple long-standing issues:

1. **Environmental degradation and soil erosion**, driven directly by **unsustainable land use practices**⁷ and exacerbated by **climate change**. This has first, contributed to a **steady decline in yields per hectare**.⁸ In the rainfed sector, average productivity is between 400 and 600 kilograms (kg) per hectare (ha) and yields as low as 250kg/ha are not uncommon.⁹ This productivity contrasts starkly with Sahelian regional averages, which are around 900kg/ha, and the potential yields of around two tons per hectare. Second, environmental degradation has **reduced the ability to withstand droughts and flooding**, as impoverished soil no longer absorbs and retains rainwater. Reduced yields necessitate further land clearance to maintain production, which along with population growth, has exacerbated degradation trends.
2. **Inequitable distribution of benefits** between the centre and the periphery. The inequality derives from multiple sources, including access to finance, land rights, access to markets, government investment, etc. However, the result remains the same: **entrenched structural poverty in peripheral rural communities** and enrichment of elites, particularly from Sudan's riverine centre. The inequities were further exacerbated with the removal of subsidies on critical products during the political transition after 2019.¹⁰ Economic marginalisation is illustrated by the estimate that despite an overall national food surplus, by the 2023 crisis up to 16.2 million people needed food aid and almost a million were severely food insecure.¹¹ Rising food prices due to Russia's invasion of Ukraine (which took place in February 2022), combined with the suspension of major international assistance programmes, was already pushing Sudan to the brink of famine before the crisis.¹²

3. Dwindling natural resources feeding into **increasing conflict pressures**. Overgrazing and the need for constant clearance of agricultural land has led to huge decreases in the rangelands used by pastoralists. This, along with political manipulation, has led to increasing **farmer-herder conflict**.^{13, 14, 15} The **purposeful displacement of rural populations** through conflict has also been identified as a tool to provide **cheap labour** for massive centrally owned commercial farms and urban construction.

These factors had already significantly shaped Sudan's agricultural and food systems prior to the current conflict. They not only present challenges in responding to the current famine, but also highlight the systems' flaws from an environmental, financial and social sustainability perspective.

Although the agricultural sector includes multiple cash crops – sesame, cotton, sunflower and groundnut to name a few – the most important food security crops are the cereal crops of sorghum, millet and wheat. Due to the acute food security issues, they will be the primary focus of this paper. The three main sectors of cereal production in Sudan are:

1. **irrigated – 20.4 per cent** of cereal production
2. **semi-mechanised/mechanised rainfed – 31.2 per cent** of cereal production
3. **traditional rainfed – 48.4 per cent** of cereal production

Additionally, the **pastoral livestock** sector accounts for **90 per cent** of livestock production. Each sector has specific challenges and opportunities that will be expanded on later.

Sudanese agricultural production sectors mentioned in this paper:



Smallholder traditional rainfed agriculture

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Semi-mechanised/mechanised rainfed agriculture

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Irrigated agriculture

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Pastoral livestock sector

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Urban gardens

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Principles for conflict sensitive support to agriculture and pastoralism

The aid response to Sudan's food security crisis must begin with **urgent relief and support for immediate production**. However, due to the long-standing systemic issues in the productive and distributive systems that have perpetuated poverty, food insecurity, displacement, environmental degradation and conflict, it is vital for humanitarian groups to consider the implications of different approaches and find ways to support **systemic change** even at the time of crisis. The disruptions in the old system can provide avenues to better alternatives that must be seized when possible.

Insofar as the current system is centralised and marginalising, an alternative system would be based on principles of **decentralisation, localisation and support**. The focus for the aid sector should be on securing important input availability within locally controlled systems, enabling improvements in rural peripheral communities, and allowing people to sustainably govern their natural resources. Ultimately, this vision describes a food system that will generate **food security, rural development and resilience** against environmental and conflict shocks.

Centralised food systems

- A system where capacities related to production, storage processing, and distribution are highly centralised and controlled by few individuals, geographies, and institutions
- Historically been associated with state-sponsored and also illegal land grabs by elites
- Greater risks of capture and rent-seeking economic activities along the supply chain
- Historically greater risks of environmentally destructive farming practices
- May increase efficiency but prone to systemic failure when conflict affects the centre

Decentralised food systems

- A system where capacities are distributed more geographically and institutionally
- Reduces risks of capture of food and checkpoint payments by armed actors
- Increases the ability of vulnerable populations to stay on their land and avoid displacement
- Increases economic and social strengths and bargaining power at grassroot levels
- May suffer from inefficiencies but has higher systemic resilience to shocks that affect the centre or any individual part of the system

While specific recommendations are provided in subsequent sections, the main principles for support advocated here are:

1. **Support local self-sufficiency** for communal and household food systems for agricultural inputs, storage and processing to complement markets. This helps to reduce market dependence, so maintaining basic production, and stabilises the availability of produce across the lean season with additional aims of:
 - a. improving conflict resilience
 - b. facilitating early recovery
 - c. enabling future rural development by adding value.
2. **Support sustainable yield and productivity growth** measured by nutrition and the value of food produced per hectare (rather than simply by tons of a specific crop) and soil health (particularly soil organic carbon), with secondary objectives of:
 - a. reducing conflict pressure from competition over limited land resources
 - b. reducing vulnerability to environmental shocks
 - c. supporting rural development.

With neither SAF nor RSF gaining a decisive upper hand at the time of writing, and with the likelihood of a destabilised security context for years to come, even if a deal is reached, the assumption of continued conflict, poor rule of law and insecurity, and constraints should be a starting point for any design processes. It is important for the humanitarian sector to understand and plan for different conflict scenarios, as agriculture is a long-term investment and requires a level of stability if it is to be done well. Aid organisations should prioritise advanced production support in areas that are less likely to suffer direct combat and mass displacement. The emphasis on local self-sufficiency should not be taken as an anti-market perspective, as market-based supply and value chains are vital for agriculture and development. Instead, it should be seen as building flexibility to withstand market shocks and ensuring production can persevere and be developed in a variety of conditions. The aid sector should complement food security and livelihoods (FSL) expertise with security and political expertise when planning for interventions.

Main drivers of agriculture and the impact of conflict

When identifying how to support the agropastoral sector in Sudan, it is necessary for humanitarian organisations to first consider the factors that impact food production and how they have been affected by the current conflict. Improving how these factors work together is essential to enhancing sustainable production and requires analysis of which of these drivers are most affected by conflict and limit production. The following section introduces the factors that impact food production systems and then investigates how they relate to Sudan's four main food production systems (smallholder traditional rainfed agriculture; semi-mechanised rainfed agriculture; irrigated agriculture; and the pastoral livestock sector).



Inputs and equipment

Inputs can be categorised into primary and advanced inputs. Primary inputs are the inputs without which production is not possible, for example, seeds and basic tools. Advanced inputs include products such as fertilisers, liming, insecticides and pesticides, which can be used to significantly increase the productivity of agriculture. For mechanised systems, fuel and machinery are also important inputs. All inputs can vary both in their quantities and quality. Although communities can produce some inputs locally, they tend to rely on markets, and are therefore vulnerable to disruptions in logistical chains and price fluctuations. **The conflict has reduced both the availability and affordability of inputs.**



Labour

Labour relates to those engaged in agriculture processes. A significant part of the Sudanese agricultural system relies on manual labour. Labour availability and quality determine what types of practices will and can be applied in a given field. **The conflict has impacted labour patterns strongly through displacement at the local level(s), as well as through the disruption of seasonal migration between states, and from neighbouring countries such as Ethiopia and South Sudan.**



Land

Land is required for all agriculture. The quality of the soil is a major determinant of its productivity and ability to withstand environmental shocks (drought and flooding). Erosion and loss of soil organic matter and soil carbon, which hold the major soil nutrients and water required for healthy plant life, have played a significant role in Sudan's diminishing yields and require urgent action. Increasing soil organic matter remains one of the most cost-effective ways of enhancing agricultural productivity and restoring viable ecosystems. **Access to land has been constrained by conflict as well as the resulting rise in criminality, while existing patterns of use have been altered through displacement. The risk of land grabs is also high with large-scale displacements and absent rule of law.**



Water

Water is required for any plant growth. Most Sudanese agriculture is rainfed and relies on a single rainy season, which heightens the impact of the rainy season on the year's overall production. **The rains are not affected by the conflict, but irrigation systems may have been destroyed or been left unmaintained because of it.**



Post-harvest and markets

The ability to process, store and sell agricultural produce is vital for food security and development. This requires both infrastructure and functional markets. **The conflict has vastly affected these systems, as storage and processing infrastructure have been looted and destroyed, and markets have been disrupted and transaction costs have surged.**



Finance

Access to finance affects the ability of households or commercial growers to access inputs, labour, land and water. Finance also helps to manage risk, develop technology or human capital, or improve market access. Agriculture, particularly high-productivity farming, tends to be capital-intensive, as it requires access to advanced inputs and mechanisation. Financing options such as loans are generally a necessary component to enable farmers to make such investments.

Sector-specific strategies

Each of Sudan's four main food production systems faces different obstacles and opportunities. Aid groups providing support to enable production must therefore understand these differences and design interventions accordingly.



Smallholder traditional rainfed agriculture

According to CFSAM 2023,¹⁶ the traditional rainfed sector covers around 9 million hectares of the approximately 26 million hectares usually cultivated and involves the largest number of farmers. The sector generally revolves around family units cultivating an area between 2 and 50 hectares for the dual purpose of consumption and commerce. The primary crop for most farmers of this type is cereal (sorghum and millet), complemented by crops such as groundnut, sesame, sunflower, cotton, hibiscus, watermelon and gum arabic. The sector predominantly relies on manual labour and does not have significant use of advanced inputs, mechanisation, finance, etc.

Status since the war

The traditional rainfed system has been significantly affected by the conflict. Production dropped from an average of 2 million MT to 1.2 million MT for sorghum and from 1.6 million MT to 600,000 MT for millet in 2023 (CFSAM),¹⁷ driven by reductions in harvested area and yield per hectare. The only location where the traditional rainfed sector had higher production, according to CFSAM, was in Sennar State, though satellite analysis of the area raises questions of the reliability of the finding.

Main conflict impacts on traditional smallholder production



Inputs and equipment – Many smallholders remain reliant on market structures or aid for basic seeds and tools. This reliance is exacerbated by displacement, as existing productive assets are generally lost in the process. The severe food shortages threaten seed stocks due to consumption, leading to a risk of further collapse of the seed systems. These risks are especially high in areas that have access restrictions for aid.



Labour – Labour quantity is generally a large limiting factor for smallholder traditional agriculture due to its reliance on manual effort. Household labour is often augmented by collective rotational communal labour, as well as migratory labour in some locations. Areas with high displacement and a reliance on seasonal migration are likely to be more affected. Areas hosting many internally displaced people (IDPs) may have opportunities from excess labour. However, aid organisations must consider the origin and skill level of the labour, as urban populations likely lack the skills to engage in agriculture effectively and will usually require training to become productive. Extreme food insecurity will threaten labour capacity as traditional cultivation is labour intensive.



Land – Access to land has been an important limiting factor for smallholder agriculture, particularly in conflict- and criminality-affected areas. Though separate from the short-term production risks, land grabs in areas with high displacement pose a long-term conflict risk.



Water – Rain should not be affected by conflict. Traditional production systems operate without, or with very limited, irrigation capacity.



Post-harvest and markets – Smallholders tend to have limited processing and storage capacity, and often sell a part of their harvest only to purchase more during the lean season. However, the increased transaction costs in the market, due to fuel prices and insecurity, have reduced the amounts farmers can make from their harvest sales while increasing consumer-facing prices. As such, many farmers will be at a significant disadvantage when procuring their inputs for the coming season, as well as topping up their cereal stores.



Financing – Lack of capital is one of the main constraints for smallholder productivity, though this was already the case prior to the current conflict. Many smallholders depend on local traders for inputs and must provide part of their harvests in payment, in essentially a perpetual debt bondage and poverty cycle.

Aid priorities for traditional smallholder agriculture

The aid sector should concentrate on supporting smallholder production in Sudan, as well as improving the food systems within which smallholders operate.

Immediate priorities

- a. **Food security, seed availability, and market access assessment** – Conduct scaled rapid assessments using tools like household surveys, focus group discussions and key informant interviews to identify the most urgent needs and vulnerabilities. Collaborate with local authorities and organisations for data sharing and coordination to reduce the potential for duplication and waste.
- b. **Scale up agricultural input distributions** – Target distributions based on assessment findings, ensuring seeds are adapted to local conditions and preferences. Include drought-resistant and short-cycle varieties to ensure quick harvests and resilience. When possible, prioritise bringing seeds from outside Sudan, given the absolute deficits of cereal in the country (shifting to local procurement the moment the threat of widespread famine passes, so to not depress local production).
- c. **Cash transfers for seeds and basic inputs** – In areas with functioning markets, provide cash or vouchers to allow farmers to purchase seeds. This approach can support local markets and allow farmers to choose varieties that suit their needs. However, as absolute scarcity of goods sets in, cash transfers need to be limited to areas where strong evidence of availability remains.
- d. **Direct food aid** – Target food aid to the most marginalised groups to protect remaining seed stocks and support the nutritional needs of farming households, ensuring they can participate actively in the upcoming planting season.
- e. **Provide guidance on wild foods** – Engage with Sudanese experts on wild foods to map out which areas have significant potential for wild foods to augment diets. Due to the large number of urban IDPs, many are unlikely to be familiar with the types of wild foods that could be available. Explore making short videos on where to look for, how to identify and how to prepare the most important wild foods, for circulation through social media.
- f. **IDP integration** – Anecdotes of host community farmers helping IDPs with the skills required for agriculture have been found, allowing them to produce food at least somewhat effectively. Explore ways to strengthen and systematise support for IDPs to engage in production, as this can help both boost production and, if done in a conflict-sensitive way, support host community–IDP relations. Engage with host communities on access to land, as this is vital; explore sharecropping or cash-for-land approaches to facilitate this.
- g. **Communication on seed distribution plans** – Utilise local radio broadcasts, community meetings and mobile messaging to communicate the scale and extent of aid, preventing misunderstandings and managing expectations.
- h. **Reduce sales risks** by developing equitable contract schemes between farmers and traders.

Medium-term priorities

- a. **Community engagement** – Engage with communities by using a high degree of participation to explore what their priorities are for developing agropastoral production with long-term time horizons.
- b. **Farmer associations/cooperatives** – Facilitate the formation and strengthening of farmer groups to improve collective bargaining power, access to resources and knowledge sharing. Provide legal and organisational training to formalise these groups.
- c. **Mobile training and training of trainers** – Develop a curriculum focused on environmentally friendly practices and adapt it for mobile units. Training of trainers (ToT) programmes or other forms of agricultural extension services, such as farmer radios, can exponentially increase the reach of knowledge dissemination.
- d. **Community seed banks** – Work with communities to establish seed banks, ensuring training in seed selection, storage techniques and inventory management. Promote the conservation and multiplication of indigenous varieties that thrive in the community's specific environment.

- e. **Explore alternative crops** – Introduce trials for crops like potatoes and sweet potatoes, which can offer nutritional diversity, are less water intensive and have short growing cycles. Include training on cultivation techniques for new crops. Bananas also have potential in some areas. Growing fodder to improve livestock productivity may also be appropriate in some locations.
- f. **Organic fertiliser production training** – Provide training and resources for composting and the production of biofertilisers, reducing dependency on chemical inputs and improving soil health. Available organic material may vary from place to place.
- g. **Low-tech irrigation solutions** – Demonstrate and distribute simple irrigation technologies, such as rope or treadle pumps or water harvesting. Provide training on maintenance and water management practices to maximise efficiency and sustainability. Training facilities to start local production are available regionally, including in South Sudan, which could facilitate scaling in Darfur and the Kordofans. Solar irrigation pumps in areas such as the Roseires Dam or along rivers could yield significant 'quick wins'.
- h. **Improved storage capacity** – Assist in constructing or improving storage facilities, using locally available materials and technologies that minimise post-harvest losses. Prefabricated concrete solutions are available regionally and stone is available in many areas locally. Explore low-tech local cool storage facilities.
- i. **Basic processing facilities** – Support the establishment of communal processing to add value, focusing on the main agricultural products of the area. Include training on operation, maintenance and basic business management. Groundnut is being produced in large quantities and mostly exported at rates that provide marginal benefits to growers. The high caloric content offers high potential for supplemental feeding if local processing can be supported. However, improved growing and post-harvest practices to reduce aflatoxin levels are also necessary.
- j. **Savings and loans facilities** – Facilitate the creation of savings and credit groups within associations to provide members with access to finance, enabling investments in inputs, equipment and other improvements.
- k. **Climate-smart/conservation agriculture training** – Offer comprehensive training in practices like intercropping, crop rotation and agroforestry, tailored to local conditions and crops. Encourage the integration of livestock for a holistic approach to farm management. Restoration of soil fertility and soil organic matter are vital for medium- and long-term sustainability and rural development.



A group of women tend to a small-scale farm in Kassala, Sudan © Nicole Jawerth / IAEA



Semi-mechanised rainfed agriculture

Semi-mechanised rainfed agriculture is practised across the broad belt of 6.7 million hectares running through Kassala, Gedaref, Blue Nile, Sennar, White Nile and South Kordofan. The farm sizes tend to be vast, from 420 to 50,000 hectares, owing to the combination of mechanisation and large-scale commercialisation. Crops cultivated include a combination of cereal crops, namely sorghum, as well as cash crops such as sesame, sunflower and cotton. Regardless of crops grown, cultivation is done for commercial purposes. Given the investment required to cultivate the vast plots, this sector relies more on finance, migratory labour, as well as functional markets for basic as well as advanced inputs.

Status since the war

The semi-mechanised sector has been seriously affected by the conflict, with reductions both in area harvested and yields per hectare, leading to a reduction in the cereal harvest from an average 2.1 million MT to 1.5 million MT, according to CFSAM.¹⁸ However, these figures are not necessarily reliable, as they assume continued high production in Gedaref, an assumption that is not supported by satellite analysis and would be challenged by the failure of the rains in the sorghum-growing areas of the state. Qualitative interviews suggest that many large-scale farmers and companies reduced or entirely suspended their activities after the conflict started. Some farmers also invested more heavily in cash crops than cereals to access hard currency through export markets due to the depreciation of the Sudanese pound (SDG), though others were also incentivised to grow hardier and less investment and effort intensive crops such as sorghum and watermelon (seeds for export). Anecdotally, investors have withdrawn a substantial amount of capital across many parts of the sector. In the absence of capital, farmers have often had to sell crops quickly in order to make production payments, reducing profits and therefore investment-willingness.

Main impacts on semi-mechanised production



Inputs and equipment – The sector is highly reliant on markets for both basic and advanced inputs, including fuel. As such, the limited availability and surging costs of inputs on the markets have had a devastating impact on the sector. The lack of access to financial services, including loans but also simply access to money, has further exacerbated the issue of inputs. Looting of fuel supplies by armed groups poses significant challenges to farms where this has occurred.



Labour – Despite mechanisation, many parts of the agricultural process remain manual, making the sector highly reliant on the availability of labour. Unlike smallholder cultivation, the sector relies on wage labour and, in many cases, migratory labour (including cross-border – for instance, from Ethiopia and South Sudan). Migratory labour has been greatly constrained, while insecurity has deterred cross-border movements significantly. Insecurity, poor access to finance, displacement and widespread hunger all threaten the available effective labour supply for the coming season.



Land – In areas with relative stability, access to land should not be a huge limiting factor for the sector. A large proportion of land was left uncultivated or unharvested in the previous season and activities can be resumed.



Water – The rains should not be affected by the conflict. The sector operates without or with very limited irrigation capacity.



Post-harvest and markets – The commercial agricultural sector generally has good storage capacity and integration with traders, though the destruction of large amounts of processing infrastructure and looting by armed groups has had an impact. The sector is also strongly affected by the presence and functionality of the markets for sales, due to its for-profit nature. Farming is not a necessary activity for investors, but instead a business case competing with other potential uses for the capital. The high costs combined with higher risks from both insecurity and ultimately market purchasing power have led many to curb their investments. The domestic cereal market creates a particularly risky business case, as it has poor purchasing power and pays in the continuously devaluating Sudanese pound.



Finance – Mechanised agriculture is particularly reliant on functional financing systems because of the large investments required to cultivate large areas. The extreme disruptions of finance, have had a huge impact on the sector.

Aid priorities for semi-mechanised rainfed agriculture

The aid sector does not traditionally have many tools for engaging with large-scale commercial agriculture. However, to meet Sudan's food security needs, it is vital that the sector is reinvigorated. As there remains potential capital for investment in production, successfully incentivising production could also lead to significant impact multipliers.

Immediate Priorities

- a. **Engagement with commercial groups** – Learn about and understand the obstacles faced by commercial farmers in the different contexts, as this is extremely important for finding ways to incentivise them to invest in cereal cultivation. Further engage with other people and organisations in the supply and value chains, such as traders, input importers, banks, etc., to find ways of stabilising markets and financial services.
- b. **Procurement** – Insofar as uncertain demand at a profitable price is a substantial obstacle to private sector investment, explore the ability to make purchasing agreements based on the US dollar (USD) for the cereal produced.

- c. **Restore financial investments** – Work with financial institutions, including but not limited to the Agricultural Bank of Sudan (ABS), to support lending capacity. This can be done through direct funds or vouchers to procure important inputs, particularly seeds, fertilisers, pesticides and machinery. This can be achieved by partnering with local financial institutions and input suppliers.
- d. **Labor support initiatives** – In areas where temporary labour deficits exist, consider training IDP populations on the agricultural skills needed to maintain production. Most IDPs are urban and lack skills, and will likely leave once security improves; therefore, focus on and be pragmatic about the skills required to contribute to local production. Guaranteeing labour rights for such support initiatives is important due to a long history of exploitation of displaced labour in Sudan.

Medium-term priorities

- a. **Rehabilitate infrastructure** – Incentivise the repair and upgrade of agricultural infrastructure, including processing for important food security and nutrition products (for example, plumpynut), as well as storage facilities. This can be done through direct support or incentives, such as purchasing agreements.
- b. **Public-private partnerships** – Explore partnerships between private and aid sector organisations to co-invest in agricultural development projects, share risks and leverage each other's strengths.
- c. **Sustainable agriculture practices** – Encourage responsible land management practices to prevent soil degradation and ensure long-term productivity. These practices include crop rotation, minimal tillage, integrated pest management, use of organic fertilisers, cover cropping and mulching. Engage with governmental bodies (when possible) on policies to further incentivise this, guided by additional analysis on major considerations.



Irrigated agriculture

There was an estimated 1.6 million hectares of irrigated land cultivated in Sudan, according to CFSAM 2023.¹⁹ This consists mainly of large-scale mechanised federal schemes (1.26 million ha), of which Al Gezira is the largest (1 million ha). The Nile plays a primary role in irrigation, though seasonal river flood irrigation is also used – for instance, in Kassala. Yields are more reliable and predictable than in other sectors, and the irrigated sector is the largest user of imported advanced inputs. However, the yields have been seriously limited by a lack of investment in canal and pump infrastructure maintenance. The main crops include wheat, sugarcane, cotton, groundnut, legumes, spices, vegetables, fruits and green fodder, and include a mixture of large-scale and smallholder production systems.

Status since the war

According to CFSAM in 2023,²⁰ production in the irrigated sector has been strongly affected, particularly for wheat, which was estimated at 378,000 MT versus an average annual production of almost 700,000 MT. The Gezira scheme was affected by direct conflict during the agricultural period as RSF successfully took Wad Madani and parts of the state in December 2023. At the time of writing, battles over the control of the state continue. Given maintenance needs, as well as market-dependency for important inputs including seed, machinery, fuel, fertilisers, etc., the impact on the sector has been – and likely continues to be – particularly harsh.

Main impacts on irrigated production



Inputs and equipment – As with the semi-mechanised rainfed sector, the irrigated areas are highly reliant on markets for both basic and advanced inputs, including fuel. As such, the limited availability and surging costs of inputs on the markets have had a devastating impact on the sector. The lack of access to financial services, including loans but also simply access to money, has further exacerbated the issue of inputs. The issues in Gezira are likely to be severe, as the RSF has looted vast storages of inputs including seeds, fertilisers, herbicides/pesticides, fuel, as well as agricultural machinery.



Labour – Labour needs vary in the irrigated sector, depending on the farm's scale, with smallholders operating usually with household and communal labour, and large-scale farms requiring a larger labour force, often including migratory labour. Labour quantity and quality are likely to be more substantial issues for any large-scale operations, though clear data on this is not available.



Land – The irrigated areas are schemes, often governmental, with set delineations and established usage rights. Gezira, where active conflict is ongoing, may in some parts suffer from a lack of land access. Schemes near or at the frontline, such as Rashad in Gedaref and Suki in Sennar, may suffer from similar constraints.



Water – The irrigated sector, especially along the Nile, has a constant water source, allowing for predictable harvests. However, the water infrastructure was already badly managed and operating with limitations prior to the conflict and will likely have become worse in many locations since the conflict. There have also been reports of communities purposefully destroying irrigation systems to flood roads or agricultural areas for fear of RSF attacks. Fuel availability poses an additional limitation on the irrigation systems.



Post-harvest and markets – The irrigated agricultural sector is generally highly market integrated, which has increased the impacts of the conflict on the sector – both in terms of supplies and sales. Market linkages and their impacts will vary strongly between different locations. For example, the directly conflict-affected Gezira has been impacted very negatively, though new irrigated areas are likely being built in the more peaceful areas of Northern and River Nile states. (However, the soil and water resources in the latter are extremely badly contaminated by cyanide and mercury poisoning from the gold industry, and pursuing agriculture there is risky).



Finance – As with mechanised agriculture, the destruction of the financing systems poses a tremendous challenge for the irrigated sector, as the high input needs make the sector capital-intensive.

Aid priorities for irrigated agriculture

The aid sector ought to seek to maximise production in Sudan's irrigated schemes, engaging with both smallholder and large-scale farmers to maximise production of crops relevant for food security.

Immediate Priorities

- a. Irrigation systems assessment** – Assess the functionality of existing irrigation schemes and the farmers operating in them, identifying areas of highest potential for cereal or other nutritious food production.
- b. Emergency input and equipment support** – Provide critical inputs like seeds, fertilisers and fuel in areas where market access is severely disrupted, through emergency distributions or vouchers (where market systems allow). In continuous irrigation systems, distribute vegetable seeds as well as possible new high-nutrition crops such as potato or sweet potato.
- c. Rehabilitation of water infrastructure** – Prioritise the repair and maintenance of damaged irrigation canals, pumps and other water management infrastructure to restore irrigation capacity. Conduct rapid assessments to identify the most critical infrastructure needs and collaborate with engineering firms and local communities for quick repairs.
- d. Labor support and training** – In areas where large-scale agriculture is practised, facilitate access to labour for large-scale operations through support programmes and training initiatives aimed at enhancing the skills of available labour forces, including IDPs and local communities, coupled with strong workers' rights provisions.
- e. Market linkages and access** – Establish or strengthen market linkages to ensure that farmers can sell their produce and access necessary inputs, focusing on creating secure and accessible trade routes. Work with local traders, local government and transport companies to facilitate logistics and provide market information to farmers.

Medium-term priorities

- a. Modernisation of irrigation systems** – Work with the private sector and government to invest in the modernisation of irrigation infrastructure to improve water use efficiency.
- b. Diversification and value addition** – Encourage crop diversification to reduce risk and improve food security, along with supporting value-addition processes to increase profitability. Provide technical assistance and training in growing high-value crops and establish small-scale processing units for products like spices, fruits and vegetables.
- c. Climate-smart/conservation agricultural training** – Work with farmers to restore soil fertility and carbon sustainably, supporting both improved yields and climate resilience.
- d. Environmental and health-risk management** – Address environmental and health risks associated with agricultural practices, particularly in areas with soil and water contamination issues (for example, in areas where there is gold mining, due to a combination of mercury and cyanide used to extract the gold). Conduct environmental assessments and implement mitigation strategies, such as phytoremediation (using plants that absorb heavy metals), safe water management practices and community awareness programmes. Devise natural soil cleaning techniques (phytoremediation), along with public advisory and advocacy campaigning.



Pastoral livestock sector

Sudan has a rich history of hosting one of the largest pastoralist populations in Africa. In 2023, the CFSAM estimated the total livestock population in the country to be approximately 111.8 million, of which 32.7 million were cattle, 41.4 million were sheep, 32.8 million were goats and 5 million were camels.²¹ The traditional pastoral system accounts for around 90 per cent of this population, making Sudan one of the top livestock-producing countries in Africa. Pastoralism is a significant contributor to Sudan's economy as it accounts for a substantial portion of the GDP and foreign exchange earnings, accounting for around 30 per cent of food and agriculture-related exports over the past 5 years. Livestock represents one of the most valuable sub-sectors within Sudan's domestic economy.

Status since the war

Pastoral livestock production in Sudan has been significantly affected by the ongoing war. The current insecurity across the country has resulted in a deterioration of all the components of the pastoral food system, including production, transportation, processing and marketing. A large number of pastoral groups have been displaced with their livestock from areas affected by conflict. Those who remain within their home areas are blocked within limited territories, which has implications on the health of herds, environmental degradation and farmer–pastoralist relations. However, there has also been flexibility in the livestock market, as livestock exports have emerged as a major revenue maker from Port Sudan to countries such as Saudi Arabia, other Gulf Cooperation Council (GCC) countries and Egypt. Producers and traders have found alternative routes to deliver livestock to exporters in Port Sudan. Growing livestock exports, especially under the current conditions of available pasture constrained by conflict and insecurity, will likely significantly hasten pasture depletion and feed subsequent conflict over land.

Main conflict impacts on pastoral production

- a. **Livestock mobility** – Mobility across the vast arid and semi-arid territories of Sudan is the backbone of the pastoral system in the country. The dominant type of annual cycle of mobility is in a north–south direction, which can extend for hundreds of kilometres. Due to the war conditions, some pastoralist groups have decided to shorten the journey, staying around the territories of their home areas for fear of losing their animals. Some, such as pastoralists that usually enter Butana, also fear being associated with RSF upon their return.
- b. **Farmer-herder conflict** – There are larger than normal numbers of livestock accumulating within farming zones due to the limited mobility and difficulty of moving to remote areas. The sustained presence of pastoralists around villages and settlements has increased farmer–herder conflict pressures and raised tensions between the two groups.
- c. **Livestock marketing**– The roads and tracks to most of the livestock markets in major urban centres across Sudan are currently blocked. Also, major regions are isolated from each other. This limits access to markets. Although this has not stopped livestock exports, it does increase transaction costs and makes distribution of goods across the country difficult. The main strategy followed by livestock traders is to collect animals from small markets in rural areas and then transport them to major urban markets. Under the prevailing conditions, livestock marketing is becoming a real challenge.
- d. **Grabbing of communal pastoral resources** – The current situation in Sudan has hampered the national and local formal governments and native administration in many areas across the country in terms of their ability to oversee land use. Land grabbing in many communal rangelands has been taking place to make way for farming and artisanal gold mining; these dynamics may be exacerbated in the current context.
- e. **Breakdown of services** – Access to veterinary services and goods such as livestock vaccines has been significantly reduced by a combination of displacement, looting and movement restrictions. This likely contributes to both deteriorating livestock health and increasing mortality.

Aid priorities for pastoralists

The aid sector has historically struggled to provide support to pastoralists, contributing to both issues with the value chain as well as tensions between farmers and herders. In the current conflict context, finding solutions to support the livelihood is vital from both a food systems and peacebuilding perspective.

Immediate Priorities

- a. Rapid assessments and food security –** Pastoralist groups often flee with their animals to perceived safe places in remote areas where they can access fodder and water, rather than concentrated urban locations. This can lead to them being excluded from aid. Carry out rapid assessments on pastoralist concentrations and conditions, therefore, and provide subsequent support.
- b. Veterinary services and animal health care –** Provide veterinary services and animal healthcare for pastoralists using a multifaceted approach. In pastoral areas, where public veterinary clinics are scarce, promote the privatisation of services, community-based animal health programmes and mobile veterinary clinics. Additionally, integrate One Health surveillance systems using mobile technology, while considering local contexts for inclusive health services for mobile pastoralist communities.
- c. Market access assessment –** Carry out a market access assessment for pastoralists in conflict-affected areas. Take a comprehensive approach to the assessment, understanding the challenges faced by pastoralists in accessing and controlling livelihood assets, and recognising the importance of restoring access to resources for pastoral survival (by working for example, with local leaders to identify alternative roads and tracks). Participatory methods – like focus group discussions, interviews and surveys – can provide insights into market dynamics at the local level. By integrating these findings, develop tailored strategies to enhance market access for conflict-affected pastoralists.

- d. Farmer-Herder conflict resolution joint committees –** To reduce the high potential for conflict between farmers and herders in areas hosting large numbers of pastoralists, work collectively with both groups to reach common solutions that reduce competition over limited resources. This could be achieved by using mechanisms that both sides are familiar with, such as Ajawid (a traditional mechanism for dispute resolution where respected members of the communities and traditional leaders get involved to reconcile the parties through compensation or forgiveness).

Medium-term priorities

- a. Farmer-Herder associations/cooperatives –** Such entities are essential to increase community-based solutions between farmers and herders and allow communities to decide their own priorities. Carry out training in peacebuilding and awareness-raising campaigns to target participants from both groups. The potential for livestock to strategically support regenerative agriculture through manure production is another potential synergy between the groups that can benefit both and improve relations.
- b. Training and awareness-raising on proper access to pastoralist groups –** Aid groups in general have limited capacity to work with mobile communities such as pastoralists. To properly access and deal with mobile pastoralists, learn about and be sensitive to the many cultural issues, such as how collective pastoral land tenure functions in specific areas and how best to develop appropriate strategies for service provision and support to mobile groups.
- c. Mobile training and skills development –** Carry out training and awareness raising for pastoralists to enable them to collectively access and advocate for their land rights in front of the formal state jurisdiction and authorities. This will help address the weakening of their traditional institutions, such as tribal administration, as well as decades of legislation that has disadvantaged pastoralists in Sudan.
- d. Land tenure reform advocacy –** Pastoralists have struggled historically with insufficient access to land. It is important to advocate to ensure pastures and routes are legally protected.



Urban gardens

In addition to the four main food production systems, urban gardens have been present in Sudan in a limited way – but are not generally considered to be part of food security strategies due to their limited production. Cities have historically depended mostly on rural production and imports.

Status since the war

No data was available on conflict impacts, but the importance of maximising all possible locations for food production has increased due to the disruption of production and market supply chains. Urban areas that are not connected to scalable trade hubs are facing a dire situation. Whether communal gardens are run by local organisations or groups (for instance, the Emergency Response Rooms), or by individuals, aid sector support for food production abilities can be valuable both in terms of calories and nutrition.

Aid priorities

- a. **Engagement and mapping of interested groups** – Map out people's major abilities and needs so that interested groups can begin food production.
- b. **Identification of suitable crops** – Map out which crops are feasible and optimal for gardens in different locations. Prioritise yield per hectare and nutritional benefits. Potato and sweet potato have great potential in suitable areas.
- c. **Mapping capacity and obstacles** – Urban gardens are likely to include disproportionately more people who have no prior experience in agriculture and horticulture. Input systems are also likely to be poorly developed. Learn about and understand people's needs to be able to support urban gardens and carry out successful programming.



Two women tend to crops as part of a climate-smart agriculture project in Kassala, Sudan

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In-depth analysis: the potential role of potato and sweet potato in Sudan's food crisis

Potato and sweet potato can potentially contribute significantly to food security due to their **high per hectare yields** (which are at least two-to-four times the yield of grain crops, and up to seven times more efficient in water use) and nutritional value. Sweet potato can further double as a **livestock feed** and **outranks most staple crops** in vitamins, minerals, dietary fibre and protein content. There are also only a few agro-ecological zones in Sudan where potato and sweet potato cannot be grown.

Potato and sweet potato are highly versatile and can be grown in anything from a large field at industrial scale to a barrel in a refugee/IDP camp or household setting. This makes them useful for being grown by **marginalised groups**, including women, agropastoralists and pastoralists, and people with little land. They further double as a **consumption and cash crop**, allowing for impacts to contribute to both food security and income generation. In the longer term, their **water use efficiency and drought tolerance** further increase their potential in conditions of environmental degradation and climate change.

However, the production systems for these crops are not well developed and require active programming to scale up. Below are some important aspects to consider if support for these crops is to be successful.



| | Potato | Sweet Potato |
|-------|---|--|
| Why | <p>Nutritional value</p> <ul style="list-style-type: none"> • Potatoes are low in fat, full of complex carbohydrates, essential amino acids, protein and minerals, with more vitamin C than oranges, more potassium than bananas and more fibre than apples. • Boiled, they have more protein than maize and nearly twice the calcium. • An average serving of potatoes with the skin on provides about 10 per cent of an adult's recommended daily intake of fibre. • A single medium-sized potato contains about half the daily adult requirement of vitamin C, as well as significant amounts of iron, potassium and zinc. <p>Yield</p> <ul style="list-style-type: none"> • Potatoes are up to seven times more efficient in water use than cereals (more kilograms of produce per unit of water). • In Sudan, smallholder farmers typically yield 8 to 16 t/ha, while larger producers achieve average yields up to 25 t/ha, significantly lower than other countries in Africa. These yield disparities can be attributed to limited access to quality seed and inappropriate agricultural practices. Reliable access to commercial seed and extension/training in agriculture practices could double or even triple yields for smallholder farmers. | <p>Nutritional value</p> <ul style="list-style-type: none"> • Sweet potatoes are a good source of carbohydrates, fibre and micronutrients. The leaves and shoots are edible, and good sources of vitamins A, C and B (Riboflavin) and moderate levels of iron and zinc. • Orange-fleshed sweet potato is an important source of beta-carotene and just 125g of fresh sweet potato roots from most orange-fleshed varieties contain sufficient beta-carotene for the daily pro-vitamin A needs of a pre-school age child. <p>Adaptability</p> <ul style="list-style-type: none"> • Requiring fewer inputs and less labour than other crops, such as maize, sweet potato tolerates marginal growing conditions (for example, dry spells, poor soil) and can act as a useful cover crop in agroforestry systems. <p>Livestock integration</p> <ul style="list-style-type: none"> • Sweet potato can be used for both human consumption and as a healthy source of animal feed. Animals fed on high-protein sweet potato vines produce less methane gas than with other feed – potentially contributing an important reduction in harmful global emissions. |
| Who | <ul style="list-style-type: none"> • Smallholder farmers: Given their relatively low input costs and high yield potential per unit area, potatoes provide small-scale farmers with significant opportunities for income generation, improved nutrition and dietary diversification. • Large scale farmers: Potatoes are highly scalable and versatile, creating opportunities for commercial production and diverse post-harvest improvements. | <ul style="list-style-type: none"> • Smallholder farmers: Small-scale farmers, particularly those in resource-constrained environments, can benefit from cultivating sweet potatoes – due to their low input requirements and high nutritional benefits. • Women farmers: Sweet potato farming often involves women farmers, supporting them economically and improving household food security. |
| Where | <ul style="list-style-type: none"> • Moderate climates: Potatoes thrive in regions with cool temperatures and well-drained soil, typically found in temperate climates, along with higher altitudes. In Sudan, particularly promising areas can be found in Kassala, Northern State and Central Darfur, though many other areas across the country have potential. | <ul style="list-style-type: none"> • Marginal lands: Rainfed sweet potato has proved to be successful in parts of Kassala and Blue Nile. Its relatively short vegetative cycle (4–5 months) fits well in agroforestry systems. It also competes better with weeds than other root and tuber crops and produces a significant amount of dry matter per hectare in both irrigated and rainfed environments. |

| | | |
|--|--|--|
| <p>How ²³</p> | <ul style="list-style-type: none"> • Access to quality seed and fertiliser: Access to quality certified potato seed and responsibly applied and appropriate fertilisers can improve yields and health of produce. Investments in tissue culture laboratories can support the production of high-quality and uniform planting material (plantlets and mini-tubers), multipliable on a year-round basis under disease-free conditions, irrespective of season and weather. Ultimately, this will encourage high yields in the shortest amount of time and open avenues for context-specific, vigorous, disease-resistant and drought-tolerant plant production. • Training and extension services: Training programmes on appropriate modern farming techniques, integrated crop management and post-harvest handling can enhance farmers' productivity and incomes. Training can extend to different ways to utilise potato in order to increase demand. • Market linkages: Facilitating market linkages between potato farmers and buyers can help increase market access and profitability. • Improved infrastructure, including establishing cold storage networks, plays an important role in building farmer confidence to invest in potato production and can play a crucial role in improved farmer incomes. • Promoting post-harvest value addition potentially diversifies sources of incomes and improves access to nutritional food. | <ul style="list-style-type: none"> • Varietal improvement: Aid sector organisations can support sweet potato farmers by promoting the adoption of healthy, locally adapted vines, coupled with the introduction, in Sudan, of orange-fleshed sweet potato (OFSP), which is particularly beneficial to children under five, preventing childhood stunting and early blindness. OFSP is also a good source of potassium, fibre, and vitamins C and B6. • Developing skills: Training programmes on agronomic practices, such as planting techniques, weed control and nutrient management, can enhance farmers' knowledge and skills. Training on how to use sweet potato in cooking – as well as in livestock fodder – can be useful to increase demand. • Value chain development: Strengthening sweet potato value chains through post-harvest handling, processing and marketing initiatives can increase market opportunities and income for farmers. |
| <p>Limitations and challenges</p> | <ul style="list-style-type: none"> • Disease and pest management: Potatoes are susceptible to various diseases and pests, requiring proper management practices to minimise yield losses. • Climate suitability: There are areas in Sudan where potato cultivation is not possible, limiting its utility and potential. • Limited experience: Many farmers in Sudan do not have extensive experience cultivating potatoes, requiring substantial training. Evidence suggests that minor technical improvements in production techniques, including the timing of fertiliser, hilling methods, irrigation management and seed preparation, greatly improve yields. • Cost of seed and access to inputs: Seed is annually imported into Sudan and is consequently expensive – with flow-down costs to producers. Inputs, particularly quality fertiliser, remain challenging both in terms of costs and access. | <ul style="list-style-type: none"> • Viral diseases: Sweet potatoes are susceptible to viral diseases, such as sweet potato virus disease (SPVD), which can cause significant yield losses if not managed effectively. • Storage and shelf life: Sweet potatoes have relatively short storage periods compared to other root crops, requiring proper storage facilities and post-harvest management practices to prevent spoilage. • Market access: Limited market access and lack of infrastructure, such as roads and cold storage facilities, can constrain the profitability of sweet potato farming, necessitating investment in market development initiatives. |

A checklist for conflict-sensitive programming

Aid groups should consider the following aspects to ensure their activities have the highest potential for sustained positive impacts and minimise the potential for doing harm.

Community engagement

- **Support local decision-making** – Facilitate community-led planning and decision-making processes to ensure that interventions align with local needs, customs and knowledge.
- **Local knowledge integration** – Utilise and respect traditional agricultural practices and local knowledge, integrating them with scientific research to enhance sustainability and acceptance.
- **Inclusive participation** – Ensure the active participation of all community members, including women, young people and marginalised groups, in agricultural initiatives, to foster a sense of ownership and confidence.

Partnerships and developing skills

- **Multi-organisation platforms** – Establish platforms for dialogue and collaboration among farmers, local governments, non-governmental organisations (NGOs), private sector partners and international agencies to share knowledge, resources and best practices.
- **Technical and vocational training** – Strengthen local capacities through ongoing training programmes in modern agricultural techniques, financial literacy and entrepreneurship to support the sector's long-term growth.
- **Institutional strengthening** – Support the development of farmer associations, cooperatives and local governance structures to enhance organisational abilities and market access.
- **Partner skills** – Support training for partners to hire and develop agricultural experts with experience in the context. Understanding of the culture and communication are critical in aid groups' ability to engage successfully with communities.

Conflict sensitivity

- **Collaboration partners** – When engaging with the private sector, keep in mind that some established organisations are linked to the previous regime and current groups involved in the conflict. Although meeting acute food needs may necessitate collaborations with a multitude of partners, seriously consider the allegiances of organisations for longer-term collaboration.
- **Land grabbing** – Sudan has a long history of land grabbing, exacerbated in many cases by displacement. Cultivation in an area may start creating claims to the land (in absence of deeds, as is often the case), and aid can work to solidify such claims. Institute mechanisms to establish the land rights of the farmers being supported in any medium- to longer-term activities.
- **Farmer-pastoralist relationships** – Pastoralists have been historically marginalised through public policy and aid, receiving a fraction of support, while pastures are continuously converted to farmland. Engage with pastoralists and avoid supporting agricultural activities in pastures and pastoralist corridors.
- **Peacebuilding integration** – Incorporate peacebuilding activities into agricultural programmes, such as shared resource management projects, to foster dialogue and reconciliation among conflicting groups.
- **Conflict assessments** – Regularly conduct conflict assessments to adjust activities based on the evolving conflict landscape, ensuring the safety of participants and sustainability of projects.

Monitoring and evaluation

- **Real-time monitoring and adaptive management** – Develop a robust monitoring and evaluation (M&E) framework that allows for the continuous collection of data and feedback, enabling timely adjustments to strategies and interventions. Explore the use of remote sensing for near real-time monitoring of agricultural production.
- **Impact measurement** – Focus on measuring both immediate outputs (for example, increased production) and long-term outcomes (for example, improved food security, economic resilience) to assess the effectiveness of interventions. Use adaptive monitoring tools such as outcome harvesting to capture wider impacts.
- **Community-based monitoring** – Engage community members in the monitoring process to enhance transparency, accountability and local skills for self-evaluation.
- **Risk management**
- **Climate risk assessments** – Incorporate climate vulnerability and risk assessments into planning processes so that interventions are designed to be resilient to climate variability and change.
- **Diversification strategies** – Promote diversification in crops, income sources/livelihoods, and agricultural practices to reduce dependence on a single crop, livelihood or market. Build flexibility to withstand economic and environmental shocks.
- **Disaster preparedness and response** – Develop and implement disaster preparedness plans, including early warning systems and emergency response strategies, to mitigate the impacts of natural disasters and conflicts on agricultural production.
- **Landmines** – The conflict has led to new planting of landmines. Assess whether this is an issue in the area where your project is planning to implement.

Gender and social inclusion

- **Gender-sensitive approaches** – Tailor interventions to address the specific needs and challenges faced by women and other marginalised groups in agriculture, ensuring equitable access to resources, training and opportunities.
- **Youth engagement** – Create opportunities for youth participation in agriculture through innovation, technology and entrepreneurship programmes to harness their potential as change agents and reduce rural–urban migration.

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