

TECHNICAL BRIEF



IFAD's response to tropical cyclone Freddy in Malawi

A collaborative approach to recovery and resilience

In the aftermath of Tropical Cyclone Freddy, Malawi witnessed unprecedented devastation, impacting the lives and livelihoods of millions of rural communities. As a nation prone to climate-related disasters, the scale of damage caused by the cyclone served as a stark reminder of the increasing vulnerability of our agricultural sector. Yet, amidst this adversity, Malawi's resilience and the unwavering commitment of its partners, including IFAD, have been a beacon of hope.

At IFAD, our focus has always been on empowering rural communities, particularly smallholder farmers, to adapt to challenges and thrive. Our rapid response to the devastation brought by Cyclone Freddy, in collaboration with the Government of Malawi and various stakeholders, demonstrates our commitment to ensuring that rural livelihoods are not only restored but strengthened against future shocks.

This report makes an effort to quantify the damages incurred, while also outlining the concerted efforts made by the individual programmes of the Malawi portfolio, as well as by IFAD through the Crisis Response Initiative (CRI), to rebuild critical infrastructure, support vulnerable farming households, and secure a sustainable path toward recovery. As we reflect on these challenges and achievements, let us look to the future with renewed dedication to building a resilient agricultural system capable of withstanding the growing threats of climate change.

I extend my heartfelt gratitude to the teams on the ground, our partners, and the communities whose courage and resilience inspire us daily. Together, we will continue to support Malawi's journey toward recovery, growth, and resilience.

Foreword by Bernadette Mukonyora, Country Director, IFAD

KEY PARTNERS

- Ministry of Finance and Economic Affairs
- Ministry of Agriculture
- Ministry Of Local Government, Unity And Culture

- Financial Access to Rural Markets, Smallholders and Enterprises (FARMSE)
- Programme for Rural Irrigation Development (PRIDE)
- Sustainable Agricultural Production Programme (SAPP)
- Transforming Agriculture Through Diversification and Entrepreneurship (TRADE)



RISING CLIMATE DISASTERS IN MALAWI: THE CYCLONE FREDDY IMPACT

Malawi has experienced an increasing frequency and intensity of extreme weather events, particularly hydrometeorological disasters such as storms, floods, landslides, and droughts. Since 1980, the country has faced over 50 such disasters, affecting millions of people. In the last decade alone, more than 25 severe rainfall-related events have occurred, impacting a growing number of communities. These frequent disasters have imposed significant financial burdens, diverting resources from development needs to cover the costs of repairs and rebuilding.

In 2015, floods caused 278 deaths and affected 638,000 people, resulting in damages and economic losses totaling \$335 million (equivalent to \$422 million in today's value). In 2019, Cyclone Idai placed Malawi among the top five countries globally most affected by extreme weather events. More recently, Tropical Storm Ana and Cyclone Gombe in 2022 affected nearly one million people.

The most recent disaster, Tropical Cyclone Freddy, struck in March 2023, exacerbating existing challenges such as a cholera outbreak and food insecurity during the lean season. The cyclone affected more than 2.26 million people, displaced over 659,278, and resulted in 679 fatalities. The total estimated cost of the cyclone's impact across social, productive, and infrastructure sectors is \$506.7 million, with physical damage amounting to \$347.2 million and economic losses estimated at \$159.5 million.

Tropical Cyclone Freddy made landfall in Southern Malawi on March 12, 2023, bringing torrential rainfall, flash floods, and landslides. It affected 13 districts, including Balaka, Blantyre, Chikwawa, and Chiradzulu. On March 13, Nkhulambe EPA recorded an unprecedented 459 mm of rainfall in 24 hours, the highest 24-hour rainfall in Malawi's history.

The cyclone caused widespread destruction to infrastructure, including power lines and road networks, leading to nationwide blackouts. Agricultural production was severely impacted, with extensive losses of crops, livestock, and property. The disaster resulted in 681 deaths, 537 people missing, and 2,186 injuries. Additionally, over 545,734 households lost crops and livestock, while more than 1.6 million households faced severe food insecurity.



IMPACTS OF TROPICAL CYCLONE FREDDY ON IFAD-FUNDED PROJECTS

Programme for Rural Irrigation Development (PRIDE)

Several investments under the PRIDE programme were significantly impacted by Tropical Cyclone Freddy. Below is an overview of the effects on irrigation infrastructure across various districts in southern Malawi.

Wowo Irrigation Scheme, Phalombe District

Access to the Wowo Irrigation Scheme was severely hampered, with the main road from Chiringa to the junction leading to the scheme rendered impassable for small vehicles and motorcycles due to its dilapidated condition. Four sections of the road, which were supported by corrugated metal culverts, were completely washed away.

Communities resorted to constructing temporary crossings, but several sections of the road were heavily scoured, with erosion depths ranging from 0.5m to 1m, further obstructing access to the site.

Despite the damage, the culvert structures built by the contractor at Nambite and those near the scheme's trading center remained intact and will require only minor downstream scour protection works.

The 630mm pipe that connects the intake chamber to the canal inlet chamber was undamaged from the intake point. However, approximately 45 meters of the pipe near the canal was exposed due to the strong river flows, which scoured the pipe. To mitigate future issues, a dyke, similar to one constructed upstream, could help prevent such occurrences.

There was significant siltation in the main canals, and sections of the secondary canals (about 70 meters) had collapsed on the left-hand side. Cracks were also observed at the canal base. This section is misaligned in terms of top levels and requires complete reconstruction.

Additionally, box culvert C1 remained structurally intact, but widening of the stream undermined the approach inlet and outlet, requiring extension and embankment backfill.

Sediment deposition was especially noticeable along the reservoir edges, with siltation measured at approximately 1.2m and 1.27m in the northern and southern reservoirs, respectively.

The Nanyowa bridge section, along with the 800mm steel pipe, remained intact. However, the approach from the WUA office was washed away and will need to be reworked. Installing a 900mm diameter relief culvert may assist in managing excess flows.



Lingoni Irrigation Scheme

Access to the site was affected, with the main road from Zomba to Liwonde, Machinga, partially cut off. Passage was restricted to vehicles weighing less than 10 tonnes due to damage just before Songani. This section has since been repaired and is now passable. The junction from Namwera turn-off to Malosa, which provides the main access to the site, also had slippery sections. These were cleared by the contractor, making the site fully accessible. There was no significant damage to the infrastructure works at the intake. However, a 0.3m high masonry wall downstream of the intake was breached but has since been reconstructed.

The contractor had cast the Northern Zone conveyance canal (3050m long) before the cyclone, but some sections were affected by scouring and erosion and need reworking. The foundation of the canal was scoured, and its embankment eroded. These minor damages were addressed during the final construction stages.

The HDPE secondary pipes, installed before the cyclone, were partly exposed due to trench erosion, requiring backfilling and compaction. The outer trapezoidal earth drain upstream of the scheme's access road, and main canals were under construction before the cyclone. Siltation and slope failure at station 0+840 of the drainage system occurred due to the disaster.

The contractor built culverts at flow paths along the main canal, but the disaster scoured the backfilled material by the culvert wing walls. These were addressed in the final construction phase. Ponding and scouring of the infield road embankment were also observed, requiring backfilling and compaction. The construction of new crossing structures at two stations (1+125 and 2+300) was recommended and completed.



Matoponi Irrigation Scheme

The access roads to the site were largely impassable, mainly due to muddy clay soils and small gullies that had formed as a result of heavy rains.

The alternative route from Zomba via Chingale to Masaula Trading Centre was also challenging for heavy goods vehicles due to damage to bridges near the Chingale trading centres. Only small utility vehicles could navigate this route. The Lirangwe-Masaula Trading Centre route was a better option but was only accessible to the contractor's heavy machinery.

The intake section was also affected, with the entire approach channel and sump submerged in water. By the time of the assessment, the water levels had returned to normal in the Shire River.

Sedimentation of the U-channel connecting to the railway line occurred, primarily due to earth falling from the sides of the excavated channel. Concrete blinding was completed, and the contractor began base reinforcement work, which had been partially silted.

The trained stream from the culvert to the Shire River was widened due to the increased volume of water from upstream.

Some damage was observed in the new road section across Box Culvert C1, primarily due to poor drainage. Parts of the road were damaged by running water and required reworking, including refilling and compacting, which has now been addressed.

The collapse of the excavated outlet trench side walls at Culvert 2, combined with scouring at the base of the U-channel connecting Culvert 3 to the railway line, led to siltation. The trained streams from the culverts to the Shire River were also widened due to the increased upstream water flow.

Main canals and infield access roads were negatively impacted. The contractor carried out embankment formation for a 50-meter section of the main canal, which had been scoured and required recompacting with selected materials. Similarly, approximately 2 kilometers of completed infield road gravelling were left in poor condition and needed reworking.

Mlooka Irrigation Scheme

The access road to Mlooka was severely impacted by wet and slippery conditions during the cyclone.

Although this is a common issue during the rainy season, Cyclone Freddy exacerbated the situation. However, these sections typically dry up and become passable after a period. Despite the destructive winds, heavy rains, and flooding, the WUA office remained resilient throughout the cyclone. The pump station area was heavily flooded but subsided within a week.

Flooding affected some toilets in low-lying areas of the scheme, but they survived the storm without significant damage. The solar farm area also experienced flooding, but the water subsided within a week.

Cost Implications Across the Schemes

The Wowo Scheme was the most affected by Cyclone Freddy and requires significant investment for both repairs and preventive measures. PRIDE revised the works under contract, leveraging resources to reconstruct damaged canals and other sections of the Wowo scheme. The PMU is coordinating with the Ministry of Finance to mobilize additional resources for river training works on two rivers that were heavily silted by floodwaters. There were no significant damages reported at Mlooka, and flood safety measures for the Matoponi and Mlooka Pumping Stations were already integrated into their revised designs. Below is a summary of rehabilitation costs for the affected schemes:

Name of Scheme	Cost of Rehabilitation (MK)
Wowo	1.3bn (750m for dyke)
Chiringa road-Wowo site junction	750m
Matoponi	19.5m
Lingoni	2.5m

Table 1 **Table: Rehabilitation costs for selected schemes**

Transforming Agriculture Through Diversification and Entrepreneurship (TRADE)

Thyolo District

Thyolo district, with a total of 220,740 farming households, experienced torrential rains, flash floods, and landslides that caused significant damage and losses to crops, livestock, irrigation facilities, fishponds, and soil and water conservation structures.

The immediate crop damage included crops that were washed away, submerged, or buried.

Cyclone Freddy also severely impacted livestock production by destroying or washing away livestock houses and other structures. Many livestock were drowned, resulting in deaths and missing animals.

The district's land resources, which are central to agricultural production, were heavily affected. Field assessments conducted at sampled sites in Khonjeni, Matapwata, Dwale, and Thyolo centre revealed that surface runoff had eroded the fertile topsoil.

This runoff led to the formation of gullies due to soil erosion and landslides, reduced soil depth, increased soil acidity, and the siltation of river streams, all of which negatively impacted nutrient availability.

	Thyolo	Command area	Farmers
Affected HH	23,530 M: 9,528 F: 14,009	2913ha	
Affected irrigation schemes	33	763.5ha	4,795 M: 1918 F: 2877
Domesticated animals	12,884		
Affected fishponds	81	9.12ha	79 M: 60 F: 19
Farming families	2974 M: 1270 F: 1704		

Table 2 **Affected households and other agricultural components**



Blantyre District

The district experienced heavy rainfall and strong winds from March 11th to 13th, 2022, as a result of Cyclone Freddy. This led to widespread flooding and mudslides across the district, impacting five Extension Planning Areas.

District	Affected HHs	Affected irrigation schemes	Affected Fishponds	Farming Families
Blantyre	4081 M: 1711 F: 2370	34	27 (59,850 stocks)	29,165 M:14,165 F: 15,000
Command area	2513ha	355ha	12,645ha	2276ha

Table 3 **Blantyre District: Affected households and other agricultural components**

The flash floods and landslides caused significant damage and losses to crops, livestock, irrigation systems, fishponds, as well as soil and water conservation structures. Additionally, the floods inundated grazing areas, increasing the risk of internal parasites among livestock, such as worms and liver flukes, due to the heightened exposure to contaminated water and flooded pastures.

The crops most affected included maize, soybeans, common beans, tobacco, and groundnuts. As a result of the cyclone's impact, most households experienced food insecurity due to the loss of food reserves, which were destroyed by flooding and the collapse of homes. This destruction also extended to household assets and personal belongings.

Immediate crop damage included crops that were washed away, submerged, or buried, ultimately leading to the rotting of mature grains over time.

Regarding land resources, the storm caused extensive damage to catchment conservation structures. Many established structures, such as contour marker ridges and check dams, were washed away. Additionally, some swales became silted, and newly planted tree seedlings were also lost to the floodwaters.

Financial Access to Rural Markets, Smallholders and Enterprises (FARMSE)

At the time of the cyclone, the programme was in its fifth year, supporting 920,000 individuals across all 28 districts in Malawi. Key interventions focused on ultra-poor graduation support, innovations within Village Savings and Loan Associations (VSLAs), and enhancing rural outreach through partnerships with banks and microfinance institutions.

In the FARMSE programme areas, 45,822 households were significantly impacted across the districts of Mangochi, Ntcheu, Balaka, Machinga, Zomba, Phalombe, Chiradzulu, Neno, Mwanza, Chikwawa, Mulanje, Thyolo, and Nsanje. Damage to these communities was extensive, with homes and toilets collapsing, roofs blown off, and significant losses of household items, livestock, and crops. Water sources, including boreholes and wells, were contaminated, and essential infrastructure such as bridges, culverts, and roads suffered substantial damage. Tragically, there was also loss of life.

In response, FARMSE actively supported district councils by assisting with damage assessments in Chikwawa and Nsanje. Additionally, the programme provided vehicles and fuel in Blantyre and Zomba to aid district-level relief efforts, ensuring that critical supplies and support reached affected communities efficiently.

Crop	Command Area (ha)
Maize	2,276 ha
Pigeon Peas	741 ha
Rice	27 ha
Cassava	66 ha
Groundnuts	740 ha
Soybeans	629 ha
Bananas	24 ha

Table 4 **Affected Crops in Blantyre**

No. Farmers	8375 M: 3255 F: 5120
Cattle	84
Goats	5,448
Sheep	3
Pigs	336
Poultry	37,750
Rabbits	1,491

Table 5 **Affected Livestock in Blantyre**

Sustainable Agricultural Production Programme (SAPP)

The assessment conducted by the agriculture cluster of the National Inter-Agency Assessment team revealed that Cyclone Freddy impacted a total cropped area of 202,095.5 hectares, with 120,416 hectares washed away and 81,679.5 hectares submerged, affecting 467,958 farming households (241,535 female-headed and 226,423 male-headed). As a result, many field crops were lost, leaving some households unable to harvest any produce. The submerged crops lost vigor and wilted due to prolonged water exposure. In partially submerged fields, nutrient leaching led to reduced growth vigor and yellowing of leaves, further impacting productivity.

The expected outcome is a significant reduction in crop yields, directly affecting food availability as households will not harvest enough to meet their needs. Notably, some crops that were nearing maturity and drying stages were submerged, leading to crop rot.

Additionally, Cyclone Freddy affected 1,428,584 livestock owned by 104,565 livestock keepers. Many livestock perished from drowning or were washed away, with others sustaining injuries. The destruction of livestock housing structures exposed the remaining animals to predators, theft, and disease.



Cluster Objectives

The primary objective is to support 279,517 affected households out of the total 467,958 impacted, with specific goals as follows:

1. Assist 168,956 affected farming households, covering 50,429 hectares, with maize seeds and fertilizers for winter cropping. This intervention aims to enhance food and income security for these households.
2. Provide 110,561 households with sweet potato vines and bean seeds, covering a total area of 33,000.8 hectares.
3. Support 104,565 affected livestock keepers with drug kits to treat injured livestock and prevent disease outbreaks among surviving animals.

These targeted efforts are essential to help restore livelihoods and ensure food security in the aftermath of the cyclone.

COST IMPLICATIONS

Output	Activities	Indicators	Target	Time Frame	Responsibility	Estimated cost (USD)	Available resources	Gaps (USD)
Agricultural Inputs provided	Procurement and distribution of early maturing Maize Seed	Quantity of maize seed procured and distributed	1,256 MT	1st Week to 2nd Week April 2023	Crop Dept	2,730,434.78	0	2,730,434.78
Agricultural Inputs provided	Procurement and distribution of Bean Seed	Quantity of bean seed procured and distributed	129.29 MT		Crop Dept	249,835.75	0	249,835.75
Agricultural Inputs provided	Procurement and distribution of Fertilizer (Basal dressing)	Quantity of basal dressing fertilizer (NPK) procured and distributed	5,024 MT		Crop Dept	6,213,256.04	0	6,213,256.04
Agricultural Inputs provided	Procurement and distribution of Fertilizer (Top dressing)	Quantity of top-dressing fertilizer (Urea) procured and distributed	5,024 MT		Crop Dept	6,601,584.54	0	6,601,584.54
Agricultural Inputs provided	Procurement and distribution of Sweet Potato Vines	Number of sweet potato vines bundles procured and distributed	5,793,930 bundles		Crop Dept	8,437,762.14	0	8,437,762.14
Agricultural Inputs provided	Procurement and distribution of assorted vegetable seed	Quantity of assorted vegetable seed procured and distributed	400 kg		Crop Dept	15,390.82	0	15,390.82
Agricultural Inputs provided	Procurement and distribution of pesticides	Quantity of pesticides procured and distributed	10,048 liters	2 nd Week to 4 th Week April 2023	Crop Dept	158,243.86	0	158,243.86
Agricultural Inputs provided	Logistical expenses (procurement, distribution, monitoring, transportation)	Procurement and distribution reports	13 district reports	April to June 2023	Key departments	265,700.48	0	265,700.48
	Grand Total					24,672,208.41	0	24,672,208.41

Table 6 SAPP Affected Areas Estimated Costs

CRI LESSONS LEARNED:

1. **Timelines and Seasonality:**
Aligning crisis response projects with agricultural seasons remains a challenge. Delays in mobilizing funds and finalizing project designs can result in missed opportunities to support smallholder farmers effectively.
2. **Market Access in Crisis Responses:** Farmers are increasingly planning for future seasons, indicating potential benefits from integrating market access and marketing components into crisis response efforts.
3. **Effectiveness of Input Provision:** Providing agricultural inputs may be too simplistic for complex food systems. While successful due to the SAPP's established base, improvements could include adding legumes to packages or providing cash for future seasons. Research is essential to develop cost-effective solutions that enhance production.
4. **Responding to Recurrent Climate Shocks:** SAPP II's flexible "Zero Component" enables rapid crisis response, unlike fixed budgets that limit adaptability. Funding from the RPSF and CRI was crucial in addressing crises like Cyclone Freddy and El Niño-related dry spells.
5. **Flexibility:** The CRI's adaptable approach allows alignment with government priorities, and the rapid decision-making process by IFAD has been instrumental in the project's success, as highlighted by the PIU.

These insights emphasize the importance of season-sensitive planning, integrating market access, and maintaining flexibility to improve crisis response effectiveness.

IFAD'S RESPONSE

Crisis Response Initiative (CRI)

The Crisis Response Initiative (CRI) was an \$8.6 million grant, comprising \$3 million from IFAD and an additional \$5.6 million from Norad. The \$3 million portion was allocated to SAPP districts in the Southern Region, including Blantyre, Chiradzulu, and Balaka. With the additional funding, the project expanded to Lilongwe and Dowa in the Central Region and Chitipa in the Northern Region. These districts, known for their high productivity, were expected to experience minimal impact from the anticipated El Niño during that rainy season.

The initiative's primary goals were to enhance agricultural production by improving farmers' access to agricultural inputs, extension services, and foundational seed support. IFAD, in collaboration with the Ministry of Agriculture, aimed to scale up the production of early-generation basic seeds to expand farmers' access to improved seeds. The Seed Service Unit inspected seeds produced at research stations and in farmers' fields to certify their quality. Seven metric tonnes of soybeans and three metric tonnes of groundnuts were produced and distributed to 900 vulnerable households for seed multiplication.

To meet the increasing demand for seeds, the project procured and installed a cooling system in the seed storage facility to address DARS's storage capacity limitations. This cooling system was essential for extending seed shelf life, especially as rising agricultural input prices, exacerbated by the Ukraine conflict and other global crises, made seeds and fertilizers less affordable for many farmers.

In total, 27,600 hectares of land, with an average of 0.4 hectares per farmer, were planted with soybeans, groundnuts, and pro-vitamin A-rich, early-maturing maize varieties. These crops were intended to increase community access to nutritious foods, helping to counter rising market prices. Additionally, farmers produced organic manure, known locally as Mbeya, to enrich soil fertility.

The project also promoted the use of locally produced bio-fertilizers for legumes as a cost-effective alternative to imported inorganic fertilizers. Agroforestry seeds and seedlings, focusing on the "4Fs" (fodder, fertilizer, fuel, and fruit trees), were procured and distributed, along with nutritious sweet potato vines, particularly the orange-fleshed varieties, which were supplied to vulnerable households.

To broaden livestock ownership, small livestock—conventional (goats and chickens) and non-conventional (rabbits)—were distributed to smallholder farmers through a sustainable pass-on programme, providing a total of 16,875 small livestock units to 2,475 households. Manure from goats was applied to maize fields to enhance soil fertility and increase crop yields, while manure from rabbits and chickens was used for backyard vegetable production, improving household food and nutritional security.

The project also provided 505 drug kits containing essential medications and vaccines for managing common livestock ailments. To ensure sustainability, each group established a drug revolving fund.

IMPLICATIONS ON IFAD PROGRAMMING

The recurring natural disasters in Malawi have significantly impacted IFAD-funded programmes. Moving forward, several recommendations are critical to enhancing disaster preparedness and risk management across the IFAD portfolio:

1. **Climate-Resilient Infrastructure:** Infrastructure subprojects should integrate climate resilience measures to withstand hazards such as floods and cyclones. This includes adhering to the "Build Back Better and Smarter" (BBB+S) approach, as outlined in Malawi's National Disaster Risk Management Policy (2015).
2. **Microfinance Institutions:** Microfinance institutions (MFIs) play an essential role in providing post-disaster credit for reconstruction and rehabilitation. MFIs can offer rapid access to emergency funds, facilitate efficient external fund transfers, and issue emergency loans. They can also suspend payment collections and prepare loan restructuring and refinancing plans based on field assessments to alleviate the burden on affected families.
3. **Zero Budget and Contingency Components:** The inclusion of zero-budget contingency components at the programme design stage is essential for disaster preparedness. For instance, the Contingency Emergency Response Component (CERC) in World Bank projects has significantly enhanced Malawi's disaster response capacity, as demonstrated by the Malawi Disaster Resilience and Recovery Project (\$104 million) and the Agricultural Commercialization Project (\$90 million), both of which effectively supported Malawi following Cyclone Idai in 2019. In SAPP II, the emergency and disaster response component is already active, reinforcing preparedness and allowing for rapid mobilization in response to crises.

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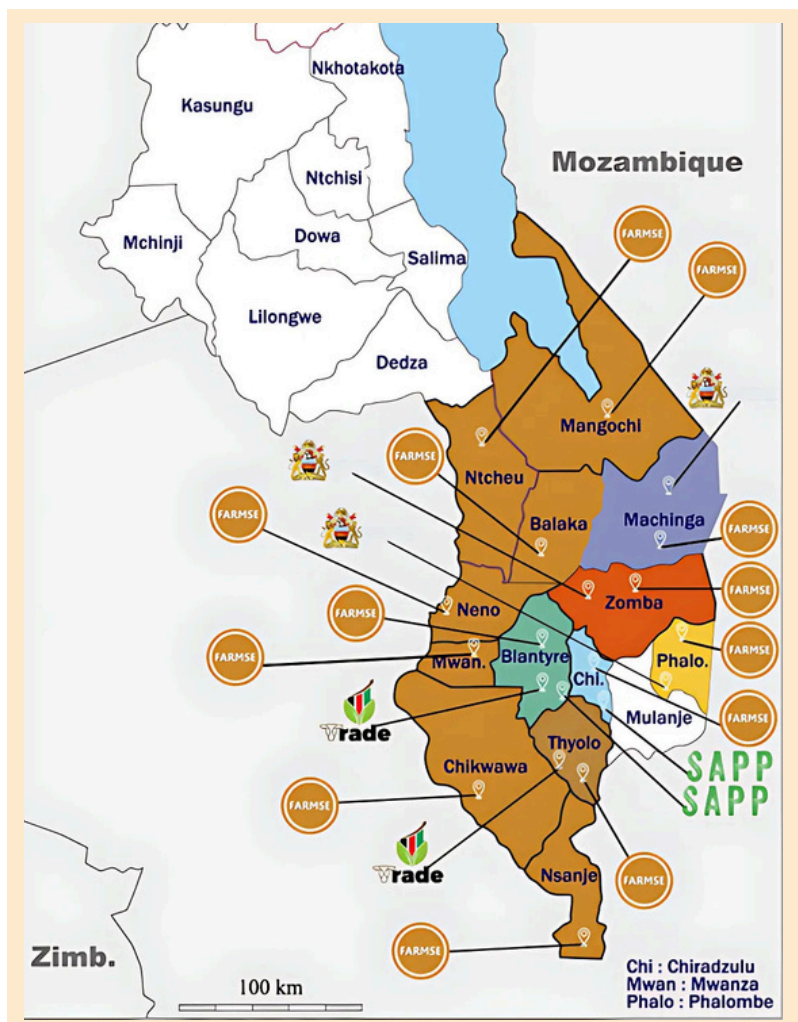


Image 1 IFAD's funded programmes in Malawi



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