Unlocking transport bottlenecks

A case study of DSM Corridor Group Ltd. in Tanzania

Who we are

The AECF (formerly the "Africa Enterprise Challenge Fund") is a leading African-owned and led development organisation that supports innovative enterprises in the agribusiness and renewable energy sectors with the aim of reducing rural poverty, promoting resilient communities and creating jobs.

AECF has raised over US$ 400 million to provide catalytic funding and technical advisory support to enterprises that struggle to meet traditional risk-return standards for commercial investors. In just over a decade, we have supported over 375 businesses in 26 countries in sub-Saharan Africa, impacted more than 30 million lives, created over 27,000 direct jobs, and leveraged US $771 million in matching funds.

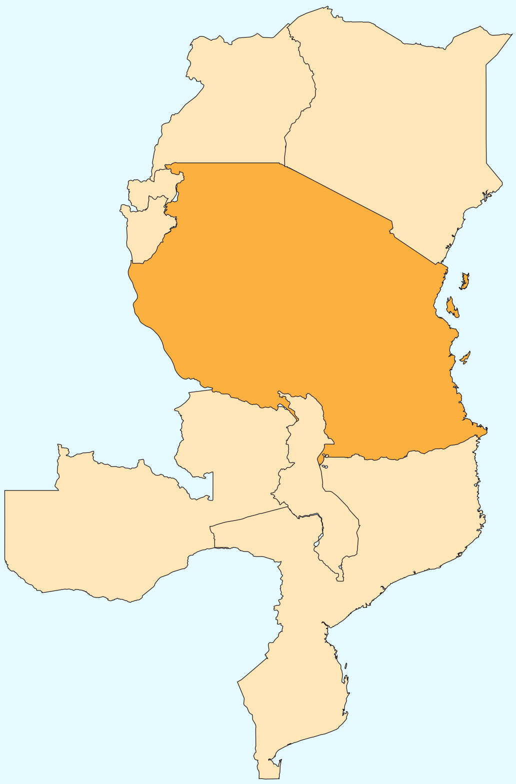
We surface and commercialize new ideas, business models and technologies designed to increase agricultural productivity, improve farmer incomes, expand clean energy access, reduce greenhouse gas emissions and improve resilience to the effects of climate change while also addressing the crosscutting themes of women, youth, and fragility. AECF is committed to working in frontier markets, fragile contexts, and high-risk economies where few mainstream financing institutions dare to go.

In 2021, the AECF launched a refreshed strategy with the objective to build resilience and sustainable incomes for rural and marginalized communities in Africa.

The Tanzania Agribusiness Window (TZAW)

The Tanzania Agribusiness Window (TZAW) is a US$ 38M ten-year programme funded by the Foreign Commission Development Office (FCDO) and the Swedish International Development Cooperation Agency (Sida).

The programme seeks to address challenges of the availability, acceptability, affordability, and accessibility of agricultural produce and products by making food supply chain dynamics more efficient and effective to serve the poor; increasing the availability of agricultural inputs such as improved seeds, agrochemicals, fertilizers, veterinary services, transportation, and information; and enabling access to processing infrastructure in both rural and remote areas. The programme also seeks to increase the production and productivity of smallholder farmers thus increasing the availability of food, stabilizing prices, and ensuring a healthier population.



AECF has invested in more than 50 agricultural-oriented companies in a wide range of value chains ranging from seed companies, horticulture, fruit and vegetables, potatoes, fertilizer, and cashew nuts. The program has impacted tens of thousands of rural people, introduced innovative technologies, and changed how markets work for the poor.

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Unlocking agricultural trade in Tanzania

Dar es Salaam seaport is Tanzania's most dominant seaport, serving as a gateway for Tanzania and its hinterland - handling 95% of the country's international trade as well as transit to landlocked countries across Africa including Burundi, Rwanda, Uganda, Malawi, Zambia and the Democratic Republic of Congo (DRC). As a result, transit volumes represent about 35% of cargo throughput in the port of Dar es Salaam (World Bank, 2018).

The cargo throughput at Dar es Salaam port has fluctuated in recent years. The dry bulk trade has shown a consistent decline between 2013 and 2016, and although this has increased since 2017, the volumes traded have still remained below the 2013 figures. These trends were caused primarily by global economic slumps, volatilities in the international commodity markets and inefficiencies in cargo and logistics handling at the port. However, COVID-19 also caused supply and demand imbalances in dry bulk commodities causing price volatilities (UNCTAD, 2020).

The cargo throughput volumes remain at only 55% of the target 28 million MT by 2025 - a result of significant ineffectiveness and operational inefficiencies. Operational challenges at the Dar port include congestion, low throughput, longer vessel waiting time, and corruption, which contribute to increased costs of domestic and international trade.

The Dar es Salaam Maritime Gateway Project (DMGP)[1] was initiated in 2017 - a partnership between Trade Mark East Africa (TMEA), DFID and Government of Tanzania, through the World Bank, to improve effectiveness and efficiencies at the Dar port by expanding port capacity for larger vessels to berth, upgrading port infrastructure, reducing congestion, cutting down on vessel waiting time and improving operational efficiencies.

This situation provided the opportunity for the AECF investment to DSM Corridor Group Ltd. (DCG), to move cargo handling and logistics outside of the sea port and reduce inherent inefficiencies as a way of reducing cargo handling and logistics costs.

How DCG innovative business model addresses the market challenge

The business model and AECF-funded innovation

DCG provides logistics solutions and cargo handling services in non-liquid and dry bulk commodities, through investments in port handling equipment, bulk terminal, import/export department and warehousing infrastructure and facilities. It deals in an array of dry bulk commodities including: agricultural products for both import, export and transit, and minerals and mineral concentrates, mostly for export.

The AECF investment led to the construction of the Kisarawe dry port as a main logistics and transport hub for agricultural commodities handling and logistics. It helped reduce congestion at the Dar-es-Salaam port and improve cargo handling, transport and trade logistics, leading to a reduction in import and export costs of agricultural commodities with knock on effects throughout agricultural value chains across Africa.

In providing cargo logistics and transport services, through the Kisarawe "one-stop logistics hub" (located, 36 km from Dar-es-salaam along the Tanzania-Zambia Railway (TAZARA) line and five (5) km away from the central corridor trunk road), DCG was set to integrate a holistic approach to logistics and transport for agricultural commodities.

Although the risks of handling agricultural commodities were identified by DSM as high, opportunities were highlighted in linking with the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) and improving cargo handling, logistics and transport efficiencies for clients engaged in agricultural value chains.

> Our model sought to encourage and benefit small holder farmers. In our Kisarawe bagging facility, we directly bagged fertilizer in bags ranging from 5 to 12.5 kgs, while most companies were bagging at 50 kgs. This made it possible for smallholder farmers to afford the fertilizer. - DCG Staff

The DCG innovation was appealing to AECF because it targeted systemic change in increasing market access for agricultural commodities and lower costs that would eventually trickle down to smallholder farmers.

AECF supported the development of the Kisarawe hub, between 2015 and 2016, as a "one-stop-shop" logistics center, that accepts all dry bulk agricultural commodities in all volumes, offering smallholder farmers access to professional cargo handling services. It takes advantage of the existing inefficiencies in handling agricultural commodities, to catalyze trade and demand for handling and logistics of agricultural commodities. This Kisarawe dry port concentrated on the following services:

- Bagging and repackaging
- dry bulk cargo handling and containerization,
- storage of agricultural commodities in the facility's warehouses,
- storage and assemblage services especially for tractor parts,
- short truck (last-mile) haulage and distribution.

Short haulage was prioritized to take advantage of the trunk roads which had undergone improvements. This reduced truck time and damage to commodities caused by poor rural road networks. DCG modified the trucks to do short hauls (shunting) from Dar port to Kisarawe hub, and improved the central corridor to Kisarawe feeder road to trunk (tarmac) standard in 2021.

Two key opportunities were critical in catalyzing trade in agricultural commodities: tapping into SAGCOT was prioritized to take advantage of the agricultural commodities produced and traded under the SAGCOT project and improve quality and efficiencies of handling agricultural inputs and outputs from the corridor.

While the Kisarawe hub's proximity to the TAZARA railway line offered an opportunity to build a connecting railway line and act as a hub link to/from the Dar port to transport cargo to/from Zambia and other landlocked countries using the line while also picking and offloading through the SAGCOT corridor.

There were a number of efficiency improvements targeted by the investment. (See figure 2)

Progress, challenges and lessons

a. Implementation progress

AECF investment supported the construction of a 4000sqm warehouse facility and supply of weighbridge, forklifts and other handling equipments, which was completed in 2016. DCG started handling fertilizer for YARA, storage and assemblage of tractor parts and tractors for 3PL, storage, handling and transportation of bagged maize for World Food Programme (WFP), handling tea in collaboration with SAGCOT for Kijani Hai, and cocoa handling for Kokoa Kamili. In 2018, DCG handled maize for KPL and teak for Kilombero Valley Teak. In 2019, however, the Kisarawe hub did not handle any cargo. This was because forward contracts had expired, anticipated linkages between TAZARA and central corridor trunk road had not materialized, and domestic trade policies and international commodity markets had forced many clients to divert import operations to other neighboring countries[2]. This concentrated the limited cargo handling to DCG Dar terminal instead.

Fertilizer has been one of the key commodities that DCG handles. In 2014, the private sector dominated fertilizer importation, storage and distribution, mainly by Yara (40%), Export Trading Group (ETG, 19%) and Premium AgroChem (14%), although this changed in 2017, with the introduction of Fertilizer (Bulk Procurement) Regulations. However, the World Bank (2021) indicates that the three importers still control 70% of the market share in Tanzania fertilizer imports. DCG anticipated to leverage on the out-grower model, where offtakers provide inputs to farmers on credit. However, the SAGCOT partnership did not bear fruit and the bulk procurement regulations limited importers to a few big players in the market.

b. Investment challenges and responses

The investment has traversed difficult periods in international and local trade and policy environments. Some of the challenges include: the global economic slowdown and low commodity prices, local government tax regulations and policies including an export ban on grains/cereals and a change in export license regulations for local mining goods that came into play in 2018. COVID-19 also impacted

Figure 2. Efficiencies created by the innovation

Time efficiencies:	Reducing the duration and time that it takes to facilitate logistics for import and export, cutting the truck-around time to and from the Dar port and reducing the cargo dwell time at the hub, will save the client on unnecessary costs of delays and storage, thus reducing the overall costs of cargo handling, logistics and imprt and export costs on the client. The significance of using trains improves efficiencies from not only a transport and cost perspective but also from an environmental point of view. The carbon footprint using train is much less than trucks i.e. a train of 25 wagons/50 containers is equivalent to 50 trucks on the road.
Quality assurance:	Professional handling of clients' cargo and logistics within international standards will improve the shelf life of agricultural inputs and outputs, safeguard quality assurance to farmers, their organizations and commodity buyers, thus fetching assured or better prices from end markets for smallholder farmers. This builds trust, sustains relationships and encourages increased volumes of goods produced and traded, thus adding commodity volumes available for DCG to handle.
Smaller and or quality packaging:	Customized packaging of say fertilizers into smaller quanities of less than 25 kgs, using the Hub facilities will reduce the costs of transport to smallholder farmers and avail inputs at a cost they can afford. Besides, handling of timber and packaging in appropriate containers for export, will improve efficiencies and reduce costs of transportation, thus managing the costs that would have otherwise been borne by clients.
Inputs and outputs logistics management information systems:	Improved and coordinated information management systems for clients will provide linkages between producers, traders, and transportes and buyers, improving transparency within the logistics chain, and opening up greater opportunities to trade locally and internationally. This provides DCG with opportunities to manage and coordinate cargo and logistics handling within such a platform.

domestic and international trade between 2020 and 2021. Whereas some of these challenges were anticipated and responses developed to mitigate their effects, others were unanticipated and forced DCG to adapt in unique ways:

- **Poor transport infrastructure and feeder roads network increases logistics and handling costs**

This challenge had been anticipated by DCG, who in turn placed particular focus on using trunk roads, which were better maintained and undergoing improvements under the new government and dealing in short truck (last-mile) haulage to reduce costs. In addition, DCG continued to maintain its feeder roads to Kisarawe hub, and eventually upgraded the connector road to full tarmac in 2021, reducing truck time to the facility by 75%.

- **Linkages to organized value chain actors and facilitators critical for access to agricultural commodities from primary and secondary markets**

It was premised that extensive marketing of commodity handling and logistics to agricultural value chain actors, would lead to increased clientele base, as well as increase volumes of commodities handled through the Kisarawe hub. However, this did not work as anticipated.

Gaining entry and linkages with SAGCOT became difficult due to a lack of clarity and limited knowledge of how the clusters operated, the failure to upgrade the TAZARA link-line to Kisarawe hub to open access to SAGCOT for DCG. Furthermore, most clients in the agricultural value chain had the capacity to independently handle logistic services that DCG intended to provide.

DCG also initiated and piloted a logistics information management platform[3] http://www.logisa.org to improve transparency and efficiency in the sector. However, this did not take off as there was a lack of consensus on the kind of platform that the funder wanted and the design characteristics that DCG believed would attract the right clientele.

- **Unpredictable government policy and tax regulations disrupts business environment and increases costs of doing business**

The Tanzania policy and tax environment became increasingly difficult for trade, and this was not foreseen. The Ancillary Services Tax (2015), introduced 18% VAT on services[4], although it was waived in July, 2017. This increased the cost of transporting goods and reduced cargo traffic and port activity by 50% and forced many clients to redirect their trade and logistics through alternative ports. While some clients came back after two years, a number did not return as they had established operations elsewhere.

The Fertilizer (Bulk procurement) Regulations, 2017 which required all fertilizer imports to be procured in bulk[5] increased fertilizer prices. As importation was done once by OCP Tanzania who won the TFRA tender in 2018, the costs of handling increased significantly[6]. DCG negotiated with OCP to handle their fertilizer imports. DCG learnt the importance of securing their clientele, by building personal relations with them through customer support systems that track customer needs and satisfaction after handling their cargo, to provide better and responsive services.

However, the effects of an export ban on cereals in 2017-2018 and the policy change in export license regulations for local mining goods in 2018, which were compounded by the effects of COVID-19 in 2020-2021, have significantly reduced domestic, regional and international trade. On the upside, the government regulation to reduce taxation on employee costs and benefits in 2021, was welcomed, as it helped DCG (and other employers) save on staff costs.

- **Volatile commodity prices in the global market affects pricing, handling and logistics**

While DCG handles more than 230,000 MT of fertilizer per year, the demand for fertilizer in Tanzania has increased from 350,000 MT in 2017 to about 500,000 MT annually (Bumb et al, 2021). However, since the fertilizer prices in the global market increased, less is imported through the bulk procurement system and this affects the haulage, cargo and logistics sector. In addressing such market unpredictability, DCG entered into forward contracts with larger clients and in some cases had to renegotiate contracts with clients. Fluctuations in the costs of cargo and logistics are also factored into year-on-year financial projections.

- **Lack of cargo containers stalls import and export services by increasing cargo handling and transportation costs, and forced delays causing losses in agricultural products**

The cargo, logistics and transportation business was affected by shortage of vessels in 2017 due falling oil prices in the international market, causing vessels to be used for floating storage as a way to hoard oil and push prices up (UNCTAD, 2020). In 2020/2021, there has been a shortage of containers and the number of vessels reduced as a result of the near closure of markets occasioned by COVID-19. Shortage of vessels means there is less cargo to handle, while a global lack of containers meant that less volumes could be exported at a higher price (loose cargo transport cost is twice as high as containerized cargo), while increasing the storage, transportation and cargo handling costs as customers have to pay a higher price for the limited number of containers to transport and export.

- **Inability of DCG to attract additional financing**

There were plans to strengthen the business in spite of the numerous challenges. However, attracting additional investment finance to link TAZARA and the Kisarawe hub as well as the planned marketing efforts were affected by lack of follow-on investment.

The potential investors were wary that investments costs could not be recovered with prevailing unpredictable local policies and regulatory environment, volatile commodity markets and disruptive impacts of COVID-19 on trade.

Despite the challenges, some successes were registered during implementation of the investment which offers further opportunities for DCG in the near future:

- The upgrade of the central corridor trunk road to Kisarawe hub to tarmac offers linkage opportunities.
- DCG receiving three ISO certifications (Quality ISO 9001:2015 upgraded from ISO 9001:2008, Occupational Health and Safety ISO 45001:2018 and Environment ISO 14001:2015) strengthens its brand identity and visibility in a competitive market.
- The establishment of Kapiri-Mposhi dry port facility

in Zambia (in 2018) under the same business model to provide chemicals logistics to mining companies in the Copperbelt (Ndola-Zambia), transporting mineral concentrates from Zambia to Dar port and distributing fertilizers within Zambia and Southern Africa destinations, which validates the efficacy of the model despite the challenges faced in Tanzania.

c. Additionality of AECF technical assistance

DCG was provided with technical assistance to support women engagement in the technical skills and functions at the facility and linkages to partnerships. While initial DCG efforts were targeted at training employees on issues of safety, security and community focused relationship building, the change to prioritize strengthening of women technical skills was recognized, as men dominated those skill areas.

Six women were fully sponsored in 2017 to undergo technical training as forklift and reach stacker operators in Bandari College. On completion, the qualified female technicians were re-absorbed at Kisarawe hub. The engagement of these women in Kisarawe was however short-lived, as most staff were relocated to Dar terminal as cargo handling capacity was low. Further training was directed to the Dar terminal which had ongoing operations.

In 2021, two additional women enrolled in other technical institutions pursuing driving courses.

Employee of DSM at the Dar es Salaam Port

DCG's investment's influence on market systems change

a. The one stop approach offers a viable approach for the right value chains

The one-stop concept has had some success for specific value chains where actors lack their own logistics infrastructure and where they need containerized solutions for shipping. Replication and crowding-in has been significant, while competition has increased in the process.

Replication
The 'one -stop' cargo and logistic center model, has been replicated in Zambia with the establishment of Kapiri-Mposhi hub. The hub is situated in the middle of the most pronounced agricultural area in Zambia. Approximately 60% of all fertilisers imported to Zambia is distributed to the northern regions where Kapiri-Mposhi is situated. Kapiri-Mposhi is also strategically located as a fertilizer hub to serve the Katanga region of the DRC.

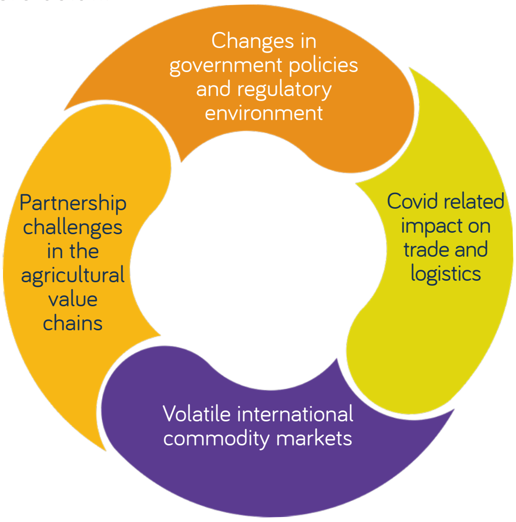
Crowding-in
Small businesses have emerged (including facility suppliers), and are thriving. These businesses provide services to the increasing human traffic in and around the facility.

Competition
Bigger clients facilitate most value chain processes that DCG had targeted (like bagging) and thus benefit only from haulage and storage because of their bigger terminals.

Timber and coffee are most affected, because most of the logistics chains are done by client hubs, leaving only the containerization part.

b. Significant challenges faced from the enabling environment

The investment faced significant challenges from the 'enabling environment'. While DCG had consistently highlighted partnership with government as the major hurdle, unpredictable government policies and laws that affected trade as well as access to update information and data in the sector, volatilities in the international commodity markets and COVID-19 impacted on local and international trade. Internally, DCG also faced challenges to access appropriate clientele within the agricultural inputs and outputs value chains, due to competitive tendencies and a conservative marketing strategy. These are represented in the figure below.



1. Changes in government policies and regulatory environment
   - Ancillary services VAT of 18% (2015-2017) disrupted business environment.
   - Fertilizer (Bulk Procurement) Regulations (2017) affected fertilizer handling and logistics.
   - Export bans on cereals and grains (2017) and changes in licencing policies for local mining products (2018).
   - Withdrawal from OGP affected access to data and information.
   - Dar port improvements reduced efficiencies in the short term.
2. Partnership challenges in the agricultural value chains
   - SAGCOT linkage failed to work, thus forcing alternative measures.
   - Big clients had established logistics infrastructure in secondary markets and put DCG in a conflicted position.
   - Non-targeted marketing strategy responsive to functioning of the agricultural markets.
3. Volatile international commody markets
   - Low commodity prices affected demand and supply.
   - Lack of vessels due to floating storage and hoarding of oil.
   - Investment funding risk increased, making it difficult for DCG to attract funding.
4. Volatile international commody markets
   - Disrupted import and exports slowing down local and international trade.
   - Caused a lack of containers making cargo handling and logistics expensive and slow.

Conclusion

The project has been a success despite facing a myriad of challenges ranging from policy changes, high fertilizer prices, and COVID-19 that affected shipping of goods and created delays in client payments. The company has developed strategies to adapt to these difficulties and remains a reliable partner committed to improving efficiency in cargo handling. It has more recently diversified into new products including for example handling sulphur for transit import to increase business streams.

In addition, in recent years, there has been government promotion of private sector such as facilitation of long-term storage in Tanzania without penalties. DCG is considering expanding the facilities in Kisarawe making it a multi -handling facility for both import and export.

The construction of the Kisarawe logistics and transport hub through the AECF support greatly decongested the Dar es Salaam port and improved efficiencies in cargo handling, transport, and trade logistics. The Kisarawe Port enabled DCG to handle different types of fertilizer and accommodate bigger vessels. This led to cost savings by exploiting their existing warehouse space at the port. Distribution is more timely as the transporters from Kisarawe do not have to deal with the Dar es Salaam traffic, quality arising from professional handling of cargo and logistics is assured and better storage of agricultural inputs and outputs has prolonged the shelf life of goods. Additionally, farmers, their organizations and commodity buyers are assured of the quality of products, leading to better prices. Customized packaging of fertilizers into smaller packages of less than 25kgs reduces the costs of transportation to smallholder farmers and makes quality inputs available at an affordable cost.

There has been a cultural gender role change that resulted from the technical assistance provided on gender inclusion. The technical assistance provided a huge opportunity for women who previously were cleaners to be able to operate male-dominated equipment for handling bulk consignment at the port of Dar es Salaam.

Despite initial resistance, women are now operating machinery alongside men. For DCG to continue thriving, a favorable business and regulatory environment, policy, stability in domestic and international trade as well as the effects of Covid 19 are the key issues to be dealt with in the near term.

End notes

1 https://www.worldbank.org/en/country/tanzania/brief/dar-es-salaam-maritime-gateway-project-fact-sheet

2 For example, Yara International, would import fertilizer through Kenya or Zambia where demand is higher and tax regime favorable, to evade the high costs of import and transit into and through Tanzania.

3 The platform was a response to lack of business information, transparency and inefficiencies in the sector. The governments withdrawal from OGP (2017) made access to official trade data limited, incorrect or manipulated and thus a need to resort to a platform that openly shares data and information of interest to players in the sector to coordinate partnerships and trade. Logistic companies and traders would register, disclose the luggage they have, where and request quotations through the system then negotiate based on value of commodities and services.

4 The ancillary services which attracted this 18% tax included: stevedoring, lashing and securing, cargo inspections, preparations of customs documentation, container handling and storage or transit goods.

5 TFRA was established under the Fertilizer Act, Cap 378 to: enforce laws., policies and regulations governing the manufacturing, importation and use of and trade in fertilizers, or fertilizer supplements; fertilizer quality control including packing and labeling; and prohibits sale of adulterated or sub-standard fertilizer of fertilizer supplements. The regulations (2017) mandates TFRA to coordinate importation of fertilizer through the bulk procurement system to invite bids and give tenders for importation of specific types of fertilizer and amounts based on the forecasted demand.

6 Increase in costs were associated with (a) monopoly which reduces competition and affects quality of fertilizer imported, (b) when low quality fertilizer is imported, cost increase as baking effect comes in with additional costs, (c) only one bulk import over several months or whole year thus increasing the costs of handling large cargo over a short time, and doing maintenance of terminal and paying workers even when there is no work/cargo.

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The AECF

West End Towers, Kanjata Road
Off Muthangari Drive / Waiyaki Way
Nairobi, Kenya

T: +254-111-035-000 | E: info@aecfafrica.org

www.aecfafrica.org

With support from the Foreign, Commonwealth & Development Office (FCDO) and the Swedish International Development Cooperation Agency (Sida)

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