



World Food Programme

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LIVES  
CHANGING  
LIVES



**INNOVATION  
ACCELERATOR**

## **SOUTH-SOUTH AND TRIANGULAR COOPERATION INNOVATION CHALLENGE**

WFP embraces innovation as a key enabler and driving force to accelerate progress towards zero hunger

September 2023

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# SSTC Innovation Challenge overview

## ABOUT SSTC IN WFP

As affirmed during the 2019 BAPA+40 Conference in Argentina, South-South and Triangular Cooperation (SSTC) is increasingly recognised as a dynamic and transformative force in the global development landscape.

It refers to the collaboration and exchange of resources, knowledge, and expertise among countries of the Global South to address common challenges, promote inclusive growth, and advance sustainable development.

SSTC can bring real, high-impact change to Global South communities through the mobilisation of financial, technical, and in-kind resources in support of global development agendas such as the Agenda 2030 for Sustainable Development Goals and the African Union's Agenda 2063.

The United Nations World Food Programme (WFP) has brokered over 35 SSTC projects up to 2023, driven by the demands of host governments in more than 39 countries across the world.

By sharing innovative solutions, best practices, technologies and know-how and by building new partnerships with the support from WFP, countries from the Global South can tap into SSTC to address common development challenges, strengthen their national systems and programmes, and ultimately work towards achieving food security and nutrition for all, aligned with WFP's mandate.

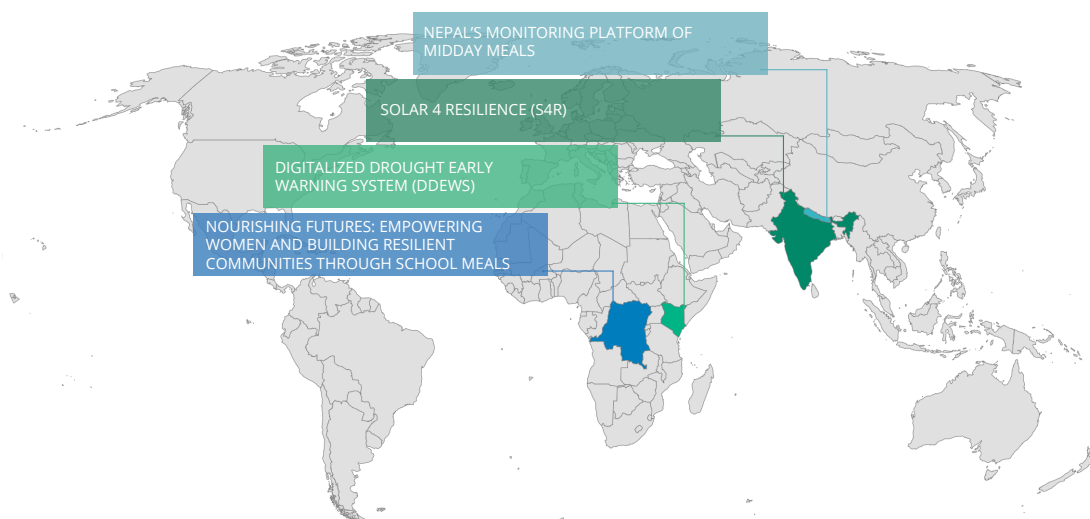
## ABOUT THE WFP INNOVATION ACCELERATOR

The WFP Innovation Accelerator was launched by the UN WFP in 2015 to source new ideas, sprint pilot projects, and scale high-impact innovations by connecting them with WFP's global network of more than 23,000 staff and field operations in over 120 countries and territories.

From its base in Munich, Germany, the WFP Innovation Accelerator has grown to become one of the world's leading social impact startup accelerators.

Each year, it offers 15 programmes addressing a wide range of social impact and sustainability issues, including climate change, primary healthcare, gender equality, and emergency response.

In 2022 alone, its portfolio of over 150 innovations reached 37 million people worldwide, with a 2X growth rate every year since its launch, and secured over \$200 million in grants.



## 2023 SSTC INNOVATION CHALLENGE

The global trend of the rising number of people threatened by food insecurity and malnutrition and the global food crisis makes it clear that WFP alone, will not be able to reach all the people in need. WFP needs to leverage its partnerships and innovative solutions available in the Global South to tackle this challenge, in line with its “saving lives and changing lives” mandate and have a greater impact on the ground.

WFP has embraced innovation as a key enabler and driving force to accelerate progress towards zero hunger.

In view of this, the Programme- Humanitarian Development Division (PRO) SSTC Unit partnered with the WFP Innovation Accelerator in Munich to launch the 2023 WFP SSTC Innovation Challenge.

The objective of the challenge was to give a voice to innovative country-owned solutions from the Global South that have the potential to support the achievement of Sustainable Development Goal (SDG) 2: Zero Hunger.

This challenge was designed to empower countries of the Global South to share innovations related to WFP’s mandate. It aims to boost low-income countries’ responses to global food crises, fortify national systems and establish WFP as a credible SSTC intermediary in the humanitarian-development realm.

It further strives to support host governments, extend WFP’s evidence-based innovations, align SSTC innovation processes, and integrate SSTC into WFP’s corporate knowledge management.

The call for applications focused on four thematic areas: social protection, resilience building, climate adaptation, and emergency preparedness and response (EPR).

Out of over 40 applications from 27 country offices, the following innovative solutions emerged as winners of the SSTC Innovations Challenge:

### DIGITALIZED DROUGHT EARLY WARNING SYSTEM (DDEWS)



Kenya



Emergency Preparedness and Response/ Shock Responsive Social Protection



Kenya’s Drought Early Warning System aims to build vulnerable communities’ capacities to anticipate drought, reduce the economic impact of drought and provide support to the most vulnerable.

### NEPAL’S MONITORING PLATFORM OF MIDDAY MEALS



Nepal



Social Protection/School Feeding



The project aims to improve and expand the coverage of the Monitoring Platform for the National Midday Meals Programme to monitor the daily delivery and quality of school meals.

### NOURISHING FUTURES: EMPOWERING WOMEN AND BUILDING RESILIENT COMMUNITIES THROUGH SCHOOL MEALS



Democratic Republic of Congo (DRC)



Resilience building



This initiative aims to boost community resilience and empower women while supporting the overall growth of the agricultural sector.

### SOLAR 4 RESILIENCE (S4R)



India



Climate Adaptation and Resilience/ Social Protection



The Solar 4 Resilience project aims to scale the use of affordable solar-based food processing technologies for building resilience and livelihoods of women and smallholder farmers.

# Phase I

After being selected, the four champions of the Innovation Challenge participated in a 7-week SSTC Acceleration Programme designed by the Innovation Accelerator. The Acceleration Programme was comprised of 3 workshops with plenaries including context related experts presenting on mutual interests and tailored mentoring sessions.

The teams benefitted from the Innovation Accelerator's expertise, tools and connections with the global innovation community (including external expert/mentor support) to provide a personalized pool of services to help host governments scale up innovations.

The workshops focused on scaling-up the initiatives, bringing human-centred design methodology into action and leveraging business storytelling for fundraising and partnership building to support the winning teams to refine, package and prepare to share their solutions with another country of the Global South in phase II of the initiative.

After completing the virtual bootcamp, the winning teams have been granted USD 30,000 to be used to turn newly acquired knowledge into action and refine the packaging of the solution, generate additional evidence on the solution's effectiveness/efficiency/replicability and further fine-tune it.

## SSTC INNOVATION CHALLENGE TIMELINE







# Deep dive on the winning solutions



# KENYA

## DIGITALIZED DROUGHT EARLY WARNING SYSTEM

 <b>KENYA</b>	Digitalized Drought Early Warning System (DDEWS)
 <b>OBJECTIVE</b>	Kenya's Drought early warning system aims to build vulnerable communities' capacities to anticipate drought, reduce the economic impact of drought and provide support to the most vulnerable.
 <b>THEMATIC AREA</b>	Emergency Preparedness and Response/Shock Responsive Social Protection
 <b>PARTNERS ENGAGED</b>	National Drought Management Authority (NDMA) – (2M, 1F), World Food Programme (WFP) – 3M, 2F). The partners involved in terms of financial support include NDMA, WFP, Food and Agriculture Organization (FAO), WORLD BANK, the European Union (EU), MERCY CORPS, NAWIRI.

### BACKGROUND AND CHALLENGE

Agriculture is central to Kenya's economy. The sector accounts for 65 percent of the export earnings and provides the livelihood (employment, income, and food security needs) for more than 80 percent of the Kenyan population.

Despite the valuable contribution of the agriculture sector to growth and employment, it remains largely underdeveloped and low in productivity. Furthermore, poor post-harvest management renders much agriculture unprofitable, with an estimated 40 percent of harvested crops being lost every year, representing financial losses of up to USD 500 million. Climate change is putting additional pressure on the food and nutrition security of Kenya's rural population and requires the adoption of climate-smart production techniques.

Drought is the single most damaging natural hazard in Kenya's Arid and Semi-Arid Lands (ASALs), destroying lives and livelihoods and undermining national development. As of February 2023, over 4.4 million people were in need of humanitarian assistance with the impacts likely to escalate with the continued climate change and variability.

Most of these costs and extent of humanitarian support required could be avoided or significantly mitigated by strengthening early warning response. To address this, the Government of Kenya and WFP have established Kenya's Digitalized Drought Early Warning System (DDEWS) which incorporates a combination of socio-economic and climate related components that have been digitalized to provide the information in a timely and efficient manner.

## SOLUTION

The Government of Kenya has been scaling up monitoring efforts since 1988, with the increase of climate related impacts, particularly drought. In 2013, the Government of Kenya through the National Drought Management Authority (NDMA) joined forces with WFP and other partners to develop DDEWS which began with manual monitoring components which now have been digitalized for improved efficiency.

By digitalizing Drought Early Warning System, governments can take early action and provide necessary support to vulnerable communities while enhancing their capacities to anticipate drought. DDEWS seeks to expedite early warning, early action and the implementation of anticipatory measures before vulnerable communities are affected by drought.

The system provides timely information in advance, during and at the early onset of drought to prompt action to mitigate potential negative impacts. Biophysical (environmental) and socio-economic indicators (e.g., rainfall statistics) are monitored monthly using mobile phone technology for timeliness and cost effectiveness. Data is managed through a web-based database updated in real time based on field surveys.

DDEWS is designed to provide information services for disaster risk reduction and address food and nutrition security.

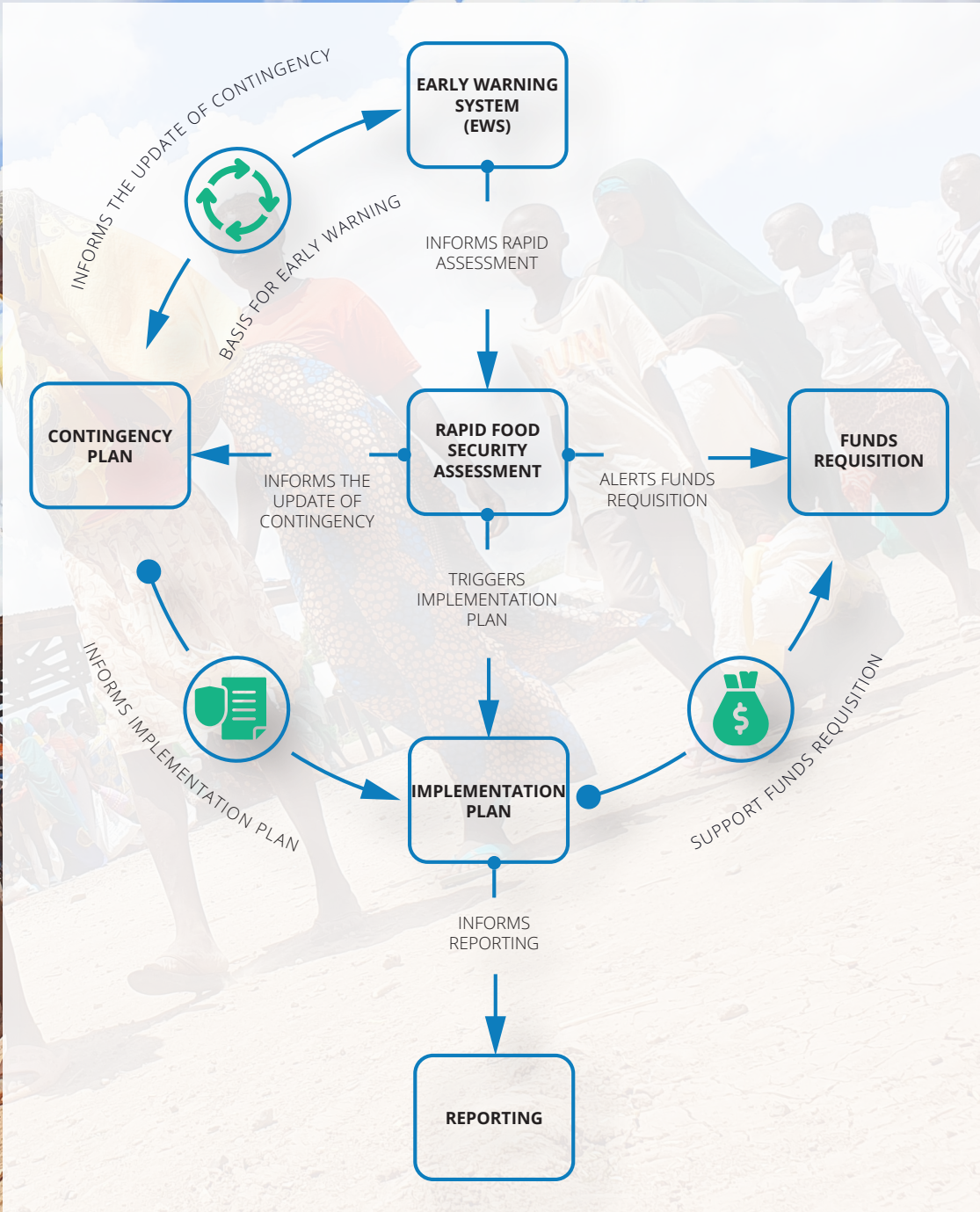
The digitalization of this system has reduced the cost of collecting paper-based questionnaires and data entry manpower by almost 50 percent, while increasing data quality through consistency checks. The Government will use information in the county and national drought early warning bulletin to inform emergency response interventions and enhance the resilience of local communities.

The Kenyan system has already improved data collection efficiency by digitalizing data collection and information storage for over 4,500 households in 154 sentinel sites across 23 ASALs counties amounting to 16 million vulnerable people affected by drought<sup>1</sup>. It utilizes automated data storage and analysis in the database to generate bulletins used for decision-making.

By February 2023, approximately 4.4 million people were identified in these ASAL areas as being food insecure in need of urgent humanitarian assistance. This number was established after the Integrated Food Security Phase Classification (IPC) analysis conducted in February 2023. The IPC process in Kenya largely utilizes data from DDEWS to establish the number of food insecure populations and is conducted twice a year, hence becoming a critical process for partners and donors in responding to food insecurity needs.

<sup>1</sup> Kenya National Bureau of Statistics (KNBS) 2023 population projections



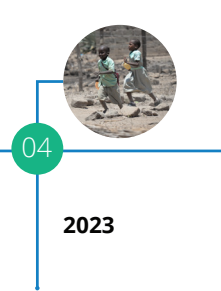


## KEY MILESTONES

First drought monitoring system in Kenya



Development of DDEWS with the Government of Kenya, NDMA, WFP and other partners



Improvements to the Drought Early Warning System made by the Government of Kenya

DDEWS is operational in 23 ASAL counties serving 16 million people

## KEY STEPS FOR IMPLEMENTING THE INITIATIVE



Secure sufficient government buy-in and ensure ample coordination and regular consultations for alignment.



Conduct consultative meetings and consolidate feedback from beneficiaries.



Ensure that the technology used can be adapted to local contexts.

## KEY LESSONS LEARNED

Some key lessons learned include:



A clear need to integrate and digitalize socio-economic and climate-related data into early warning systems for efficient information dissemination.



The importance of government ownership and commitment to ensure the sustainability of the system.

## NEXT STEPS

In 2023, the initiative looks to amplify the impact of the system through engaging experts to assess and develop the best modality for sharing the technology with other countries of the Global South.

# NEPAL

## MONITORING PLATFORM OF MIDDAY MEALS

 <b>NEPAL</b>	Nepal's Monitoring Platform of Midday Meals
 <b>OBJECTIVE</b>	The project aims to improve and expand the coverage of the Monitoring Platform for the National Midday Meals Programme to monitor the daily delivery and quality of school meals.
 <b>THEMATIC AREA</b>	Social Protection/School Feeding
 <b>PARTNERS ENGAGED</b>	Local Governments and Schools of Nuwakot District. Cooperating partner: Shanti Volunteer Association (SVA). Implementing partner: Community and Rural Development Society Nepal (CARDSN).

### BACKGROUND AND CHALLENGE

The Midday Meal programme has been implemented in Nepal since 2015 aiming to boost universalization of primary education by increasing enrollment, retention and attendance simultaneously impacting on the nutritional levels of children.

The Midday Meal is the second largest education sector programme with an annual budget of USD 90 million, which contributes to the nutrition and education of 3.3 million children with daily mid-day meals in schools.

The programme is decentralized and funded by a federal grant of the Ministry of Education Science and Technology which is disbursed to the 753 municipalities (local governments) of Nepal who are responsible for implementing the programme.

These municipalities have limited capacity to oversee the implementation of this programme in schools as they are fully responsible for purchasing food, cooking meals, and feeding students.

The schools were manually recording the distribution and logistics of feeding children which reduced capacity of schools and can lead to misinformation.

In addition, many municipalities have little control over how funds for the Midday Meal Programme are spent by schools as most schools are located in remote areas that are difficult to reach.

To address these challenges the Government of Nepal, WFP, other UN agencies and education sector development partners have developed the Monitoring Platform for Midday Meals that allows remote monitoring of the implementation of the school feeding programme and doesn't require travel to the project sites.

The proposed innovation will contribute to real time monitoring and daily reporting results of the Midday Meal which will enable efficient implementation of the programme. This will also ensure timely response to the challenges and mitigating the risks for better results and broader achievements.



## SOLUTION

In Nepal, Midday Meals are delivered to 27,000 schools daily benefiting 3.3 million school children in 753 municipalities. The Government of Nepal regularly invests in the national Midday Meals programme, decentralizing education funds to schools to facilitate its implementation.

Strengthening the monitoring of the Midday Meals programme is a priority of the Government as this is the first step to establish a comprehensive cost-effective real-time monitoring system.

In 2022, the Monitoring Platform of Midday Meals prototype was developed and tested in Bidur municipality of the Nuwakot district.

The monitoring platform is a digital, cost-effective and user-friendly tool which enables municipalities to monitor daily delivery and quality of school meals while also tracking students' attendance. Its purpose is to ensure the nutritional and educational well-being of students.

The initiative aims to improve and expand the coverage of the monitoring platform for national midday meals, currently being piloted by 12 municipalities in Nepal in collaboration with WFP.

The Monitoring Platform uses Short Message Service (SMS) as a cost-effective, digital and easily implemented solution to monitor the delivery and quality of Midday Meals in remote areas that also facilitates real-time programme adjustment.

The piloted SMS-based monitoring platform enabled teachers to collect information on student attendance, school meals served, reasons for not feeding, and implementation of planned school meal menus.

Information received is used for analysis, feedback and follow up on the schools experiencing challenges (e.g., irregular feeding, not feeding at all, not following the agreed menu, feeding junk food, inaccurate/inconsistent reporting).

The platform also aims to ensure that falsification of data is avoided, and meal deliveries are completed. In case of incorrect codes or inconsistent information sent (e.g., if the number of school meals served is larger than student attendance), the system will reject the data and automatically notify the sender to correct it. Simultaneously, the IT or focal person at the local government will be notified of inconsistencies and follow up.



Data rejected by the system must be resubmitted by the sender on the same day (or until the next day). The system should notify the IT focal point if any data was rejected and not corrected by the sender.

Thanks to its low cost and minimal connectivity requirements, the platform can be replicated in remote areas with limited funding and in other countries with similar contexts and challenges with access to remote locations.

The real-time digital monitoring system provides daily results reports of Midday Meals in a single text message. It also includes automated data visualization, enabling evidence-based decision-making at the local government level.

In 2023, the platform is being enhanced with automatic reporting capabilities and implemented in 12 municipalities of the Nuwakot district.

Through an improved monitoring process, the platform will ensure the delivery of estimated 6,382,440 daily meals (value at USD 736,450) to 35,458 students annually in Nuwakot, providing them with highly nutritious food.

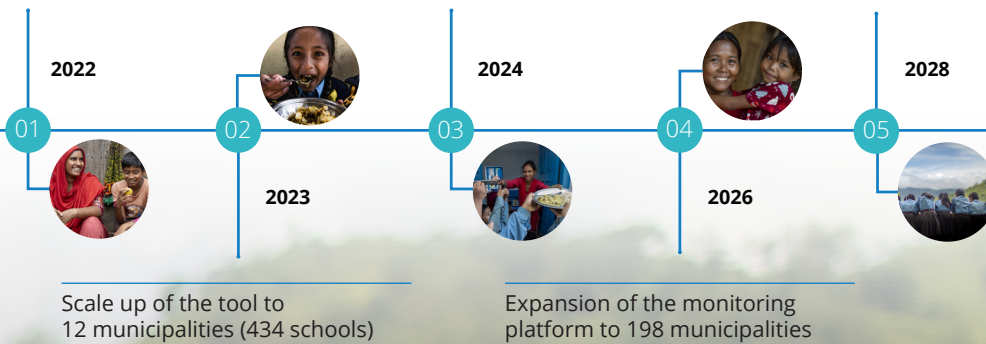
Streamlining the process will enable municipalities to reduce operational costs (e.g., travel, reporting and information analysis) associated with the Midday Meals Programme.

## KEY MILESTONES

Development of the solution by WFP and piloting of the solution by Bidur municipality (60 schools)

Expansion of the monitoring platform to 37 municipalities

National coverage of the tool. Support the Government's Education Management Information System (IEMIS)



## KEY STEPS FOR IMPLEMENTING THE INITIATIVE



Fostering collaboration at school levels

- Collaborate and coordinate main stakeholders (schools' staff, suppliers and partners).
- Monitor and evaluate the effectiveness of the programme and the impact of the project.



Strengthening capacities of stakeholders

- Provide technical guidance and support to schools, school management committee.
- Provide technical guidance and support to local government officials.

## KEY LESSONS LEARNED

Some key lessons learned include:



The need to strengthen the capacities of the municipalities to monitor programmes and manage funds delivery.



The importance of considering the geographical constraints of the country and the remote locations of schools when adopting the solution.



Prioritizing the transition from paper-based monitoring practices to digitalized ones.



Enhancing the quality of Midday Meals to meet national nutritional standards.



Establishing regular communication and coordination with partners to assess needs for capacity and resources.

## NEXT STEPS




Upon the successful piloting and decision for further scale up and availability of resources, over the next three years, the monitoring platform is expected to be expanded to cover 198 municipalities in 22 districts across two provinces in Nepal.

To achieve this goal, the following objectives and events have been planned:

- Expanding the usage and utility beyond SMS-based systems to web-based solutions.
- Needs assessment and cost estimation in the remaining areas of the School Meal Programme monitoring.
- Providing trainings, workshops, and conducting study visits for development and education partners to bring awareness to the platform.
- Exploring areas for fundraising among development and education partners as well as finding new funding opportunities.
- Working closely with the Government at all levels to enhance the platform.

# DRC

## NOURISHING FUTURES: EMPOWERING WOMEN AND BUILDING RESILIENT COMMUNITIES THROUGH SCHOOL MEALS

 <b>DEMOCRATIC REPUBLIC OF CONGO (DRC)</b>	Nourishing Futures: Empowering Women and Building Resilient Communities through School Meals
 <b>OBJECTIVE</b>	This initiative aims to boost community resilience and empower women while supporting the overall growth of the agricultural sector.
 <b>THEMATIC AREA</b>	Resilience Building
 <b>PARTNERS ENGAGED</b>	The Government of the DRC, Ministry of Primary, Secondary and Technical Education (MEPST), the Ministry of Agriculture (MINAGRI), financial institutions.

### BACKGROUND AND CHALLENGE

The Democratic Republic of Congo (DRC) is the second largest country in Africa, endowed with abundant natural resources and a young, highly diverse population of about 95 million people that is expected to double in the next twenty years<sup>1</sup>. Despite favourable natural conditions for agriculture, the country falls short of producing enough food and relies heavily on neighbouring countries to meet the needs of the DRC population.

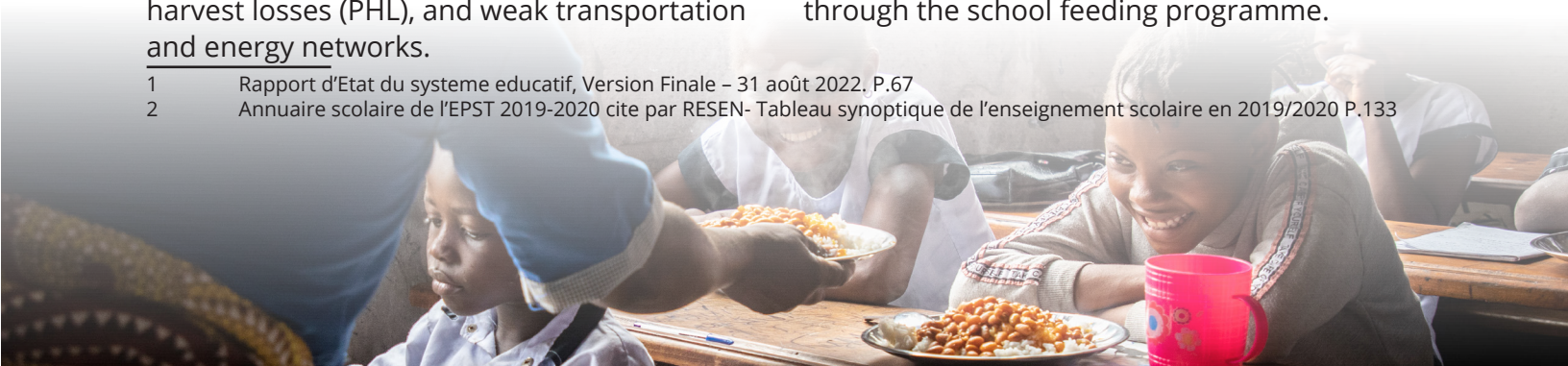
Barriers to sustainable food production include inefficiencies across food systems, with poor access to quality and affordable agricultural inputs, overreliance on consumption of few crops such as maize and cassava, high post-harvest losses (PHL), and weak transportation and energy networks.

In the DRC, while primary school enrollment has increased to nearly 19 million pupils, less than 70 percent of children complete their primary education<sup>2</sup>. The main reasons for dropping out include high tuition fees and hunger among students in rural environments, particularly affecting rural girls.

To address these challenges, the Government of DRC and WFP have developed a pilot initiative to empower women and build resilient communities by providing technical assistance to smallholder farmers growing cassava to help them increase yield and train them on processing cassava nutritious products that will be offered to students through the school feeding programme.

1 Rapport d'Etat du systeme educatif, Version Finale – 31 août 2022. P.67

2 Annuaire scolaire de l'EPST 2019-2020 cite par RESEN- Tableau synoptique de l'enseignement scolaire en 2019/2020 P.133



## SOLUTION

In 2022, the DRC Government and WFP joined forces to improve school feeding programmes and empower communities in the country through the innovative self-financing model, Nourishing Futures - Empowering Women and Building Resilient Communities through School Meals.

This model emphasizes sustainable agricultural farming as an income source, aiming to ensure the autonomy and sustainability of school meals, supporting both canteen and community development models.

The programme leverages the double potential of cassava products. Consumed by 95 percent of Congolese, cassava cultivation mobilizes almost all agricultural assets, first for self-consumption, then as a source of guaranteed income for rural households.

Chikwangue, a fermented cassava sub-product, has high nutritional value as it contains vitamins A, C, D and K and is rich in nutrients such as iron, magnesium and calcium. It can be fortified with plantains and groundnuts, contributing to enrich the nutrition content of school meals.

Recognizing the power of women in driving change within their communities the project

aims to empower women entrepreneurs by providing access to a sustainable source of income and promote women's economic independence and decision-making capacity.

The objective of the initiative is to support the local community to produce and transform local cassava product as an effort to provide rich and balanced school meals to 1,000 school children in the next 3 years. This can be done by processing the cassava harvested from women-led community farms to supply school canteens.

As a result, the project aims to empower 1,000 women smallholder farmers and community members to generate income to finance canteens and promote local development.

Currently, the project focuses on producing Chikwangue for the Mosolo school that is located in the semi-urban area of Nsélé in Kinshasa province and comprised of 340 students.

The project in Mosolo aims at providing fresh cassava products produced by a community farm and looks to capitalize on the popularity and consumption of cassava in the country by developing the cassava value chain where women entrepreneurs can play a central role.





Through a community-based approach, the project creates linkages between the farm, cassava processors and consumers (school children) to establish a sustainable supply chain model, improve the nutritional value of school meals and generate income for local development.

In addition, women's groups and a local farm receive support to produce cassava and other fresh products. The community also agrees that a share of this production is distributed to school meals, in the form of the processed cassava product Chikwangue (fermented cassava bread).

The project not only addresses the gender inequalities prevalent in education but also enhances community resilience and women's empowerment which addresses SDG 2 and SDG 5.

The initiative draws inspiration from successful experiences in the Republic of Congo and Madagascar.

Recognizing the impact and the potential of the initiative, WFP aims to expand to four satellite schools, reaching an additional 660 school children and positively impacting their nutrition and education. This pilot feeds into WFP's efforts to support the DRC government to launch a national school feeding policy and programme.

## KEY MILESTONES

WFP supported the Mosolo school to purchase food for 340 children



A coordination platform created with MEPST, MINAGRI and WFP for the monitoring of this project



Peres Jesuites, a local community farm plot of 4 hectares, started producing cassava and other fresh foods

A total of 1 hectare of cassava is under cultivation for an estimated production of 30mt of roots



## KEY STEPS FOR IMPLEMENTING THE INITIATIVE

Strengthening capacities of local farmers, with a focus on female farmers by:



- Providing technical guidance and support to community members;
- Enhancing collaboration and knowledge sharing;
- Facilitating training sessions and workshops to enhance smallholder farmers' capacity and promote sharing of best practices in farming techniques.

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Fostering collaboration at school level by:



- Collaborating and coordinating with main stakeholders (school staff, suppliers and partners);
- Monitoring and evaluating the effectiveness of the programme and the impact of the project;
- Proposing improvements for enhanced outcomes.

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Providing strategic guidance by:



- Providing strategic guidance on the integration of the school feeding programme and resilience initiatives and their alignment with government priorities;
- Advocating for the integration of the pilot schools into the national school feeding programme;
- Supporting the identification of risks and mitigation measures.

## KEY LESSONS LEARNED

Some key lessons learned include:



Government leadership is key for the success of this project. MEPST is the lead in ensuring the expansion and public funding of the school meals programme in DRC. The Mosolo pilot is bringing to the table MINAGRI to ensure the linkages with local smallholder agriculture respond to the needs of the school feeding programme, while promoting income generation for smallholder farmers.



Engaging local communities in the school feeding programme also requires supporting parents and community members to generate additional income to become more resilient. The establishment of a local community farm will enable revenue to be invested in the community and contribute to improving schools' infrastructure and more.



Consultations with food scientists are essential to ensure food safety and to provide valuable advice on nutritious food that are best suited to fortify Chikwangue.

## NEXT STEPS

In the next three years, the initiative looks to amplify the impact and empower more people by scaling up the model to reach 1,000 school children in Kinshasa, providing them with the nutritious food as well as improving farmers' groups capacities to process and reduce Post-Harvest Losses of cassava to supply safe products to school canteens.

To achieve this goal, the following objectives and events have been planned:

- Coordination meetings with the Ministries of Education and of Agriculture to seek government financial allocations as well as the integration of the Mosolo schools into the 2023-2024 allocation of the School Meals public budget (estimated at USD 10 million for DRC).
- A workshop with the project stakeholders to prepare the school feeding season, discuss the procurement model and agree on scale-up plans.
- Organize a training with the agricultural services for women's groups on the processing and enrichment of cassava into Chikwangué.
- Conduct an exchange visit potentially with the Republic of Congo and Madagascar to learn and discuss similar solutions, challenges and lessons to improve the Mosolo pilot.

## TESTIMONIALS



Noella is an 11 year old student of the EP Mosolo school in N'sele, DRC, whose favorite subject is the French language. She walks for 30 minutes everyday in the morning from Monday to Friday to go to school with her younger siblings.

When students don't have access to proper nutritious, safe and healthy food, their concentration in class is limited. Noella also faces this challenge. With the support of WFP, she is very happy with the food. Her hope is that every school has access to food as she knows first hand the difference having steady access to meals can make.





She is benefitting from 1 hot meal per day. Noella is one of the 385 children in EP Mosolo primary school benefiting from the school feeding programme.

The school also owns a garden where they are growing food crops such as okra, cooking spices, spinach, banana plantain and local fruits. Their wish is to become independent and support the school from their own yields although they are short of land.

Noella is grateful to WFP and is looking forward to a bright future as a journalist.

# INDIA

## SOLAR 4 RESILIENCE

 <b>INDIA</b>	Solar 4 Resilience (S4R)
 <b>OBJECTIVE</b>	The Solar 4 Resilience project aims to scale the use of affordable solar-based food processing technologies for building resilience and livelihoods of women and smallholder farmers.
 <b>THEMATIC AREA</b>	Climate Adaptation and Resilience/Social Protection
 <b>PARTNERS ENGAGED</b>	Government of Odisha, India, Science for Society Techno Services Pvt. Ltd. (S4S), Odisha University of Agriculture & Technology, Social Action for Community Alternative Learning (NGO- SACAL).

## BACKGROUND AND CHALLENGE

India has one of the world's largest economies and is a food surplus nation. It also has some of the world's largest food-based social protection programmes, reaching more than 800 million people with subsidized rations, 118 million children with school meals and 90 million women and children with targeted supplementary nutrition. Yet a significant portion of India's 1.3 billion people suffers from food- and nutrition-related challenges.

Although the Government has been upgrading its transportation systems and supply chains, it still faces efficiency and grain loss challenges due to inadequate storage.

More than a third of children are malnourished as a result of poor knowledge and practices with regard to nutrition, hygiene and intra-household food access and consumption.

Women and girls are at a greater disadvantage due to gender inequality. As men migrate to cities for work, women are often left behind to tend farms and perform unpaid work.

India faces significant challenge of climate change and the smallholder farmers depending on agriculture are most affected.



Lack of energy access prevents smallholder farmers preserve and process food postharvest, losing up to 40% of the produce at farm level.

Furthermore, gender inequality, lack of land ownership, and job instability keep women and their families in poverty.

While technology solutions exist locally, the ecosystem is fragmented without sufficient incentives to create sustainable markets.

Also, a lack of processing technology and equipment and limited access to energy reduces the ability of smallholder farmers to preserve and process food which results in 40 percent loss of their produce.

Science for Society Techno Services Pvt. Ltd. has developed a solution which they tested in some areas in India.

Based on the results, in order to combat these challenges at scale, the Government of Odisha, India, WFP and S4S, have initiated the Solar 4 Resilience (S4R) project in early 2023.

## SOLUTION

The S4R initiative aims to scale up the use of affordable solar-based food processing technologies for building resilience and livelihoods of women and smallholder farmers by processing perishable food, thus reducing post-harvest losses (PHL).

The project also reduces coal/electricity-based emissions. As part of the project, WFP and the Government support women farmers in transitioning into micro-entrepreneurs assisting them with obtaining low-interest loans from local banks to purchase the equipment.

The initiative strengthens the capacity of women farmers for their entrepreneurship development.

Trainings are conducted in sourcing and processing raw materials (e.g., vegetables, millet, fish/seafood, and other commodities), on topics of packaging, branding, marketing and digital and financial literacy.

Using solar-based technology, women micro-entrepreneurs increase their income and reduce vulnerability to food insecurity.

The solution is not limited to processing and marketing but also works closely with the government to strengthen the entire supply chain of horticulture produce from production to consumption.



## THE PROCESSING CYCLE

**Raw Material Procurement and Supply:** The technology partner S4S with support from the Government procures fresh vegetables (e.g., onion, turmeric, ginger, tomato and garlic) giving priority to local smallholder farmers/markets via the Farmer Producer Organizations (FPOs) and provides the raw materials to women micro-entrepreneurs who have the solar powered food processing system to process the produce.

**Training and Capacity Building:** Women micro-entrepreneurs are trained by WFP and S4S on various aspects of entrepreneurship, starting with preparing the raw materials by grading, cleaning, cutting, and then processing/dehydrating using solar-powered dryers.

**Primary Processing by Women:** Each woman can process up to 150-200 kg of vegetables every day. Generally, 50 kg of raw material is reduced by 5 times to 11 or 12 kg (i.e., to reach the targeted moisture content).

**Collection of Non-Perishable Goods:** The processed produce is collected and aggregated by S4S for quality assessment for the customer at the central facility and delivered to the Food and Beverage Industry for distribution.

The S4R model is a cost-efficient model that incorporates technology, smallholder farmers and micro-financing keeping women at the centre of its design:

- The processing system is easily operated and maintained. Moreover, it can be operated with minimum electricity which creates an opportunity to expand the model in rural parts of India and to other countries of similar context.
- The project leverages the services of the State Bank of India, Regional Rural Banks and Indian Overseas Bank to provide easy financing for women-farmers at an affordable rate with no requirement of initial upfront capital or collateral.

- WFP and S4S provided training and market linkages that brought women-farmers an annual additional income of USD 1000-1500 that directly contributes to their profit and doubles the household income.

Overall, through the project, WFP and the Government empower women by including them in economic activities, contribute to family incomes, reduce post-harvest losses and the adverse climatic and economic impact on smallholder farmers and leverage government schemes to develop a sustainable model that can be shared with other countries of the Global South.

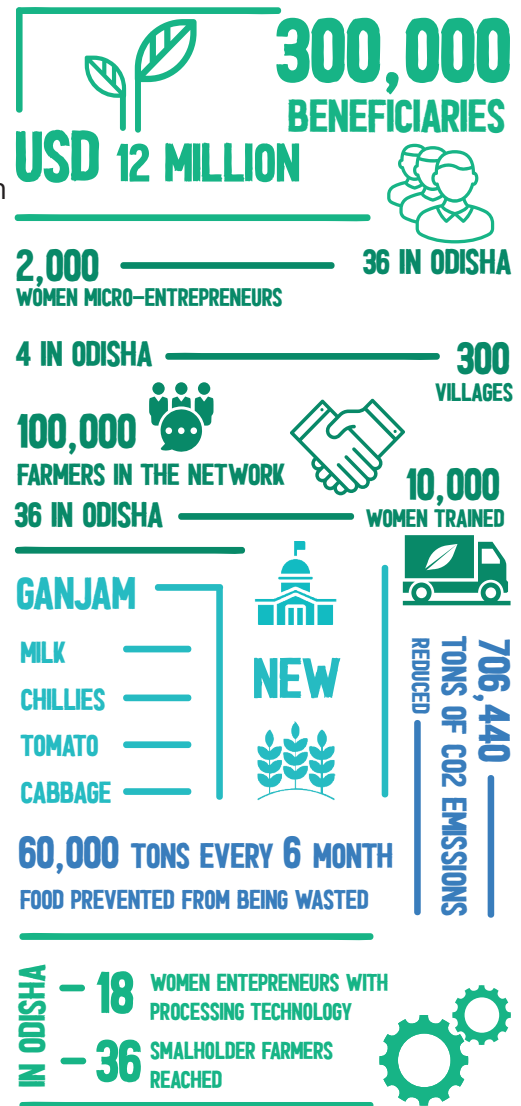


## FIRST PHASE OF THE INITIATIVE

In 2019, S4S supported the project to reach 300,000 beneficiaries, generating an additional income of USD 12 million. Currently, 2,000 women micro-entrepreneurs are using the technology. WFP was associated in 2021 through assessments and understanding of the solution and conceptualized the S4R project with the Government in 2022.

## IMPACT OF S4S TECHNOLOGIES

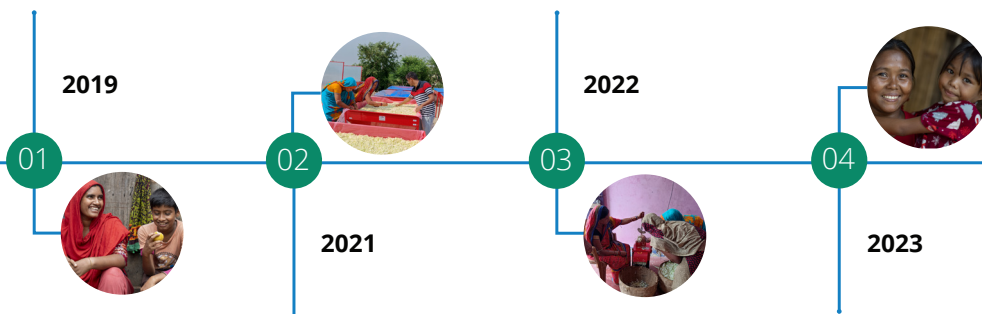
- Number of villages where S4S is present – 300 (4 in Odisha);
- Total number of micro-entrepreneurs with additional income – 2000 (36 in Odisha);
- Number of farmers in the network - 100,000;
- Number of women trained - 10,000 (36 in Odisha);
- New geography expanded – Ganjam, Odisha;
- New products opened - milk, chillies, tomato and cabbage;
- 60,000 tons of food prevented from food waste every 6 months;
- CO2 emission prevented to date - 706,440 tons;
- Number of women entrepreneurs with processing technology in Odisha – 18;
- Number of smallholder farmers reached in Odisha – 36.



## KEY MILESTONES

S4S supported the S4R project

The S4R project conceptualized with the Government



WFP engaged in the S4R project

The S4R project initiated with the Government of Odisha, India, WFP and S4S

## KEY STEPS FOR IMPLEMENTING THE INITIATIVE



Identify entrepreneurs interested in being involved in the S4R project and build their capacity by providing training.



Enhance linkages with the financial service providers and facilitate further assistance.



Further develop and maintain the solar-based food processing technology and promote the adoption of the innovative model.



Build a recognizable brand, support packaging and establish sustainable value chains from production to markets.

## KEY LESSONS LEARNED

Some key lessons learned include:



The S4R project promotes the recognition of rural women as farmers and decision-makers that improves their participation in agriculture sector and within their households.



There is a need to involve all stakeholders and facilitate convergence of multiple schemes to build resilience of small, marginalized farming households to further empower women and ensure sustainability.



Straightforward communication systems between the stakeholders involved are essential for systematized progress.



Training, leadership development workshops and participatory governance are key to enhance beneficiaries' decision-making and support shifting from cash crops to diversified mixed food crops and vegetables.

## NEXT STEPS

In the second phase, the project looks to scale up to reach around 40 million beneficiaries targeting women smallholder/landless farmers across India and other countries of the Global South.

To achieve this goal, the following objectives and events have been planned:

### NOVEMBER 2023

Documentation and assessment of the solution on effectiveness and scalability.

### DECEMBER 2023

Development of quality protocols and training materials.

### MARCH 2024

Dissemination workshop with select states and countries.



## TESTIMONIALS



Jhuna Pradhan is a marginal farmer in Giria village of Hinjilicut block. She has a five-member family with children at school level. She has a half acre of small, submerged land, where it is impossible to cultivate kharif crops.

To sustain the family her husband migrates to Surat every year. Many times, she works as an agricultural worker at other farms to support family expenditure. She is also a member in Abhiram SHG.

Initially she did not understand the S4R and its utility. After an orientation and a trial phase of the operation she is very confident and hopeful for her assured income in future.

Moreover, getting 980 Indian Rupees in just four days of work was a great assistance in her time of need. In just four days effort was a great assistance in her time of need. This raised hope of good nutrition and education for her children in future.



Jasmin is a young and energetic girl, she even completed +2 level at Hinjili, but due to a family financial problem, she could not complete her education.

She is an entrepreneur at Ganesh SHG at Giria. Her family belongs to BPL category with little income through daily wages by her parents, which is insufficient for her family to survive.

To address the situation, she considered migration to search for a job. At the time SBT orientation in the village brought new potential for her future. She learnt the process and operation of solar drying and was encouraged by the opportunity to earn and contribute to her family's livelihood.

She is hopeful about her future and looks to complete her studies while working and to act as an agent of change and take these kinds of initiatives forward.

# Way forward

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As next steps, in phase II of the SSTC Innovation Challenge, the four champions will refine their solutions and share them with other countries of the Global South.

In this phase, the winning countries will support the adaptation of their solutions to the recipient country context.

The SSTC Unit in WFP HQ in collaboration with other technical units will provide follow-up to ensure the solution take-up is integrated into the broader recipient country capacity strengthening efforts and the recipient countries will develop communication and knowledge management materials to document results and lessons learned.



6.5  
Km  
SLR

**Photo page 1:** WFP/Narendra Shrestha

**Photo page 2:** WFP/Jonathan Chacha

**Photo page 5:** WFP/Kabir Dhanji, WFP/Deborah Nguyen, WFP/Danijela Milic, WFP/Vincent Tremeau, WFP/Michael Tewelde, WFP/Josh Estey

**Photo page 6:** WFP/Kabir Dhanji

**Photo page 9:** WFP/Martin Karimi

**Photo page 10:** WFP/Kabir Dhanji, WFP/Martin Karimi, WFP/Rose Ogola, WFP/William Olale

**Photo page 11:** WFP/Narendra Shrestha

**Photo page 12:** WFP/Narendra Shrestha

**Photo page 13:** WFP/Saikat Mojumder, WFP/Narendra Shrestha, WFP/Rein Skullerud

**Photo page 15:** WFP/Vincent Tremeau

**Photo page 16:** WFP/Sadeq Naseri

**Photo page 17:** WFP/Vincent Tremeau, WFP/Paulele Fall, WFP/Sadeq Naseri

**Photo page 20:** WFP/India CO

**Photo page 22:** WFP/India CO

**Photo page 23:** WFP/Saikat Mojumde, WFP/India CO, WFP/Rein Skullerud

**Photo page 25:** WFP/India CO

**Photo page 27:** WFP/Josh Estey

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