



WFP's approach to Planet-Friendly School Meals

Prevailing unsustainable agricultural practices to feed an increasing population have caused enormous damage to our planet, leading to depletion and pollution of natural resources, the loss of entire ecosystems and climate change.

According to the School Meals Coalition (SMC)¹, school meals represent a unique opportunity for food system transformation. The SMC has been created with the goals of enhancing the reach, quality and sustainability of school meals, supporting healthier diets and shorter and more sustainable value chains to boost equitable smallholder farmers' economy, especially for women.

The White Paper on Planet-Friendly Schools, launched at COP28 by the SMC, argues that school meals can effectively address challenges such as malnutrition, environmental degradation and climate change, and economic inequality, by engaging schoolchildren and adolescents as agents of change and through the power of food procurement for school meals.

Healthy and sustainable food habits promoted in schools will also influence children's families at home now as well as the families of the future. School meals procurement can create demand for planet-friendly food production practices and support local agriculture.

November 2023

1. SMC is a global network of governments, international organizations, civil society, and the private sector, hosted by WFP.

Policies that are ecologically sustainable, from the perspectives of agroecology, biodiversity, regenerative agriculture, food sovereignty and climate are almost always economically sound, providing long-term returns especially to human capital and agriculture.

While policy change can create nutritious and planet-friendly school meals everywhere, approaches may differ according to the context and specifically between high and low income countries.

KEY AREAS WHERE SCHOOL MEALS PROGRAMMES CAN DRIVE SYSTEMIC CHANGE IN LOW INCOME COUNTRIES

National governments can forge policies that directly affect schools but also that indirectly leverage food procurement for school meals to influence food systems.



MEASURES AT SCHOOL LEVEL:

1. Menu changes which encourage dietary shifts to promote planetary and human health

Governments can integrate sustainability considerations into context-specific and evidence-informed standards for school meals. Using effective planning and rigorous monitoring to ensure that menus are:

- * Nutrient rich and diverse including whole grain, legumes, fruits, vegetables and low impact animal foods (e.g. aquatic foods).
- * Integrate fortification of staple foods where needed.
- * Culturally relevant, integrating traditional, indigenous, heritage foods
- * Locally procured from smallholder farmers (e.g. Home Grown School Feeding (HGSF) model).
- * Ecologically produced increasing agrobiodiversity, climate resilient, and planet-friendly (e.g. regenerative

agriculture, green energy, energy efficiency, drought or flood tolerant species, adapted to local growing conditions)

2. Clean and energy efficient cooking solutions

Because of the high volume of meals prepared, schools are large contributors to inefficient cooking. School meals need to be cooked avoiding negative health, environmental and socio-economic impacts:

- * Shift from cooking with biomass on traditional stoves and privilege clean cooking solutions where feasible (e.g. gas, electricity, liquid fuels).
- * Provide vocational training programmes to chefs and kitchen personnel, including on the advantages and use of new technologies, sustainable cooking practices and the co-development of planet-friendly recipes.
- * Ensure kitchen and school buildings are climate resilient and planet-friendly in case of refurbishment.

3. Prevention of food loss and waste and reduction of plastic use

On-farm and post-harvest food losses to pests and contamination need to be overcome. The use of plastic reduced where possible and recycling explored:

- * Prevent food loss by using methods such as processing and storage (canning, milling and hermetic bagging), ecological pest control, cooling and drying.
- * Measure food portions to avoid waste.
- * Dispose of organic waste matter through composting.
- * Minimise the use of plastic and look at recycling opportunities.

4. Food system education

Mixed theoretical and hands-on learning strategies to understand the interconnectedness between food systems, health and the environment are key for students of all grades:

- * Embed learning about the impacts of food systems on the environment and climate as part of the national curriculum
- * Prioritize real-life and practical activities such as farm visits, practicing in school gardens, taste sessions and waste awareness

MEASURES AT SUPPLY CHAINS LEVEL:

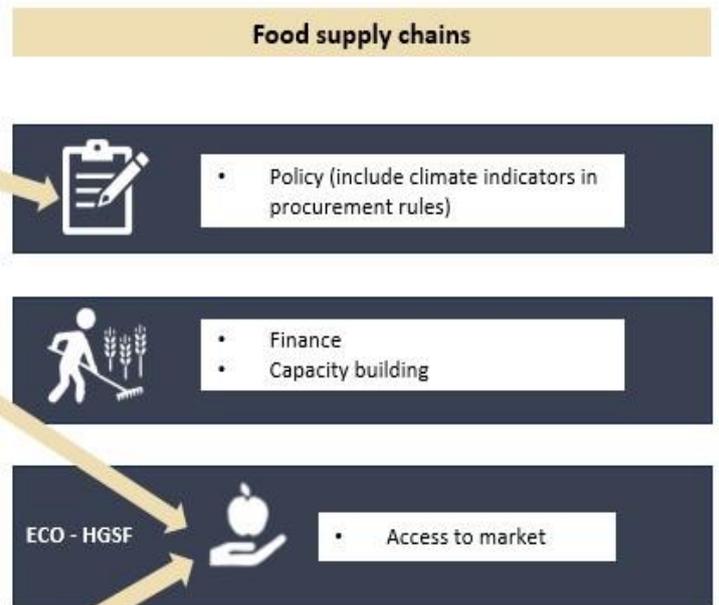
5. Policy changes to promote planet-friendly food systems

To promote ecologically sustainable farming systems and agricultural practices, food procurement should promote and give preference to planet-friendly agricultural approaches, such as regenerative or organic farming, agroecology and agroforestry, low carbon technologies and energy systems (energy efficiency and green energy). Concrete actions to support local Micro Small and Medium Enterprises (MSMEs), farmer organizations and cooperatives and to adopt planet-friendly practices across supply chains include:

- * Integrate climate targets in policies, recommendations, procurement rules and contracts guiding school meal provisioning at national, regional and local levels.
- * Make innovative financing models available to MSMEs to support green and climate resilient investment (e.g. grants, microfinance, blended finance).
- * Provide capacity building opportunities for MSMEs on planet-friendly food systems (e.g. technologies and

practices, climate services and knowledge products, tailored agroadvisory services, innovative insurance)

- * Build linkages to markets including to schools



WFP'S ROLE

WORKING WITH SCHOOLS

WFP has six decades of experience supporting school feeding initiatives and working with more than 100 countries to set up sustainable national school feeding programmes. In 2022 alone, WFP reached 20 million schoolchildren with nutritious meals and snacks in some of the most food-insecure regions of the world. In the next 10 years WFP is planning to provide school meals to 35 million children in 30 of the most fragile and low-income countries. The planet-friendly approach has several entry points in school-based programmes:



ECO-Menus. The School Menu Planner PLUS is a monitoring application developed by WFP to digitize and automate school menu creation. Using Artificial Intelligence, the tool crunches billions of data to generate menus,

in under one minute, optimizing nutritional value, sourcing options and pricing, always privileging locally sourced and cost-effective foods. Either government or WFP Country Office staff in a total of 34 countries have been trained to date. The software is available in six languages and could be made to include considerations that privilege planet-friendly foods.



ECO-HGSF. WFP's HGSF approach links school feeding programmes with local smallholder farmers to provide millions of schoolchildren with food that is safe, diverse, nutritious and locally produced. Agriculture can help reduce

poverty, raise incomes and improve food security for 80 percent of the world's poor who live in rural areas and work mainly in farming. Despite producing most of the world's food, smallholder farmers tend to form the majority of people living in poverty and food insecurity. In many developing countries, women comprise over half of the agricultural workforce. ECO-HGSF interventions can



support a shift toward ecologically sustainable food systems that are also improving livelihoods.



Clean cooking appliances, fuels and practices.

WFP is the leading agency promoting alternatives to inefficient cookstoves and open fires in schools with

interventions in 18 countries and distributing 10,700 improved institutional stoves in 2022 alone. Despite these efforts it is estimated that 80 percent of cooking in WFP-supported schools is carried out on open fires and firewood. Although cooking is a major need, it remains underfunded with dramatic consequences for the environment, economic development and on the health of cooks, largely women. Work on clean cooking to reduce wood extraction, smoke and greenhouse gas emissions also presents a concrete opportunity to monetize emission reductions through carbon markets. Training of cooks on cooking practices is key to optimise energy use (e.g. using dry wood, using lids and pressure pots and decreasing the power while simmering) and prepare healthy recipes.

School infrastructure. In addition, WFP supports governments in the construction and rehabilitation of school infrastructure. In-house engineering capacity and technical expertise ensures that kitchens, canteens and storage facilities meet the quality standards for safe and healthy meal preparation, proper food storage, insulation, and ventilation. The construction of water infrastructure such as pumping systems and rainwater collection systems, enhances resilience against climate impacts. The installation of solar energy systems helps to showcase how renewable energy can power clean cooking, water pumping, lighting and other energy services.



Education. Schools are not only places where children learn but also entry points for innovation and best practices to reach surrounding communities. They can serve to raise awareness for climate change adaptation and mitigation measures to children, teachers and parents. Schools can be laboratories to demonstrate the benefits of clean cooking and low carbon energy solutions, promoting transformative change in the wider area. Many of WFP-supported schools host vegetable gardens to provide students with hands-on experience on sustainable and climate-friendly food production approaches. WFP has accumulated experience in applying Social and Behaviour Change Communication approaches to strengthen nutrition interventions in schools and surrounding communities that can be related to diet change and environmental protection.



Food loss prevention and waste.

Refrigeration prevents food loss at all stages of the food chain, including in schools.

Organic waste from kitchens can be composted. Packaging of school food should be biodegradable where possible or recyclable. On a daily basis WFP delivers food (bags of cereals and pulses, bottles of vegetable oil, boxes of biscuits, sachets of nutrient-rich special foods) to millions of people across the world and is researching ways of decreasing its impact on plastic waste, making packaging non toxic when disused and reusable where possible.



To enhance monitoring and planning for better programming, WFP has developed and tested a digitally integrated platform, **School Connect**, with data collection, analytics and reporting capabilities. It enables schools to

timely and accurately track enrolment and attendance, and meals served, manage food stocks and record deliveries and losses. It works both online and offline using a variety of devices such as tablets and phones enabling even those many WFP-supported schools located in remote areas with poor infrastructure to report accurate data. Digitization relieves school staff from manual processes and enables them to focus on education-related tasks, supporting decision making. This tool represents an opportunity to introduce the collection of climate, energy and other environmental monitoring data for better tracking and planning of a “planet-friendly” food system transformation.

WORKING WITH FARMERS



WFP supports smallholder farmers and the agricultural sector through inclusive growth and the sustainable dissemination of energy equipment and services to boost food



production, local processing and reduce post-harvest losses through preservation. WFP’s procurement footprint in these markets provides a good base for agricultural growth by granting local smallholder farmers with a predictable outlet for their products, leading to a stable income, more investments and higher productivity. Strengthening market access and promoting inclusive procurement mechanisms helps to protect livelihoods and build resilience. This is done through access to agricultural inputs, training, promotion of smallholder aggregation systems and market-based provision of equipment (e.g. solar irrigation, milling, de-husking, chilling, drying, smoking, cold chain). Over 2 million smallholder farmers in more than 60 countries already benefit from WFP’s agricultural market development activities.

HGSF encourages the diversification of production towards local crops with a special emphasis on fresh foods, for their higher nutritional values. Energy is key to increasing the quantity and quality of food produced, to preserve it for longer and to process it. To ensure that food value chains are low carbon, this energy needs to come from renewable sources. This also makes it cheaper, more reliable and contributing to the local economy. WFP is working to develop methodologies that can estimate the carbon emissions of the commodities it procures the most.



CASE STUDIES



ARMENIA



Target location: Armenia, Shirak Province (Arpi Lake Community)



Key partners: Ministry of Education, Culture, Science and Sport, School Feeding and Child Welfare Agency of National Centre for Education Development and Innovation Foundation, smallholder farmers and enterprises



Energy services: E-cooking, heating, refrigeration, water pumping, productive uses (e.g. baking, mechanised poultry production, milk pasteurisation, cheese making)



Cost per model¹ (US\$): 295,000

PLANET-FRIENDLY SCHOOLS:



Highlights

- Improved local food production for school meals
- Introduction of nutritious whole grains in wheat value chains
- Education on nutrition and environment for students and their communities
- Greenhouses and hydroponic for school gardens
- Economic growth through employment, increased business for poultry and dairy enterprises
- Reduced fossil fuel purchases and CO2 emissions

Overview

In 2020, WFP launched the **Transformative Schools Feeding Model** in 51 schools across the country, which included construction of greenhouses (traditional and hydroponics facilities), establishment of berry gardens and intensive orchards equipped with modern-to-art agricultural technologies to ensure children have access to adequate and nutritionally balanced food all year round. To support schools in reducing the operational costs of cooking hot meals and school-based agricultural facilities, WFP promoted revolving models by installing solar power stations and transitioning to renewable energy sources. So far, 97 schools have installed a total capacity of 2,351 kW of



solar PV, enabling schools to save more than US\$400,000 annually and reducing greenhouse gas emissions by 1,140 tCO₂e annually.

To further contribute to the availability and accessibility of nutritious foods, WFP integrated the wholegrain wheat value chain into the National School Feeding Programme, promoting healthy eating choices among schoolchildren as well as enabling key actors along the value chain to expand their production and business viability. This went beyond education and public awareness campaigns, with a commitment to promoting ownership, leadership, and engagement among programme participants.

To capitalize on the investment in transformative school feeding and increase community and business involvement, WFP developed the **Arpi Model** which supported schools to install solar power to heat water, greenhouses and classrooms, to cook school meals, bake bread, and refrigerate fresh foods. In addition, local dairy production sites and poultry and egg farms received new equipment to mechanize their production processes. The intervention is generating additional revenue that are redirected to cover the operational needs of school feeding and community development.

This successful model strengthens the connection between businesses, communities and schools thus promoting social, economic and environmental wellbeing through social cohesion.

Scale-up potential

The model can be scaled up in 9 additional communities, one per each of the remaining provinces in Armenia.

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1. Each integrated "model" includes the introduction of school-based agricultural components in two schools, solarization of five schools and investment in four-five local SMEs.

EL SALVADOR



Target location: El Salvador, San Salvador, San Miguel, La Libertad, Cuscatlán, and La Unión



Key partners: Ministry of Education, Parent community, teachers, local authorities, private sector, and local and international donors



Energy services: E-cooking, refrigeration, water pumping



Cost per kitchen (US\$): 30,000 - 40,000

PLANET-FRIENDLY SCHOOLS:



Highlights

- Kitchens crafted from repurposed shipping containers
- Clean and hygienic E-cooking at an affordable price
- Rainwater collection systems
- Drip irrigation in school gardens saving up to 70 percent water, producing nutritious food
- Education on nutrition and environment for students and their communities
- Solar energy to power energy services avoiding GHG emissions

Overview

In El Salvador, many schools lack proper kitchen and storage facilities causing a variety of food safety challenges and putting children’s health at risk. The poor condition of school kitchens and infrastructure for food preparation has been a great cause of concern within the government. Recognizing the urgent need, the Ministry of Education, Science and Technology (MINEDUCYT) identified the improvement of the condition of school kitchens as a priority.

To address the urgency, WFP has introduced a ready-to-use, cost-efficient and low-maintenance solution, the **"Kitchen-in-a-Box" (KIAB)**. Smart kitchens are made from used shipping containers, equipped with state-of-the-art technology including solar panels that provide renewable energy to reduce greenhouse gases and costs, induction stoves, and 3rd generation electric pressure cookers making them eco-friendly and complying with all sanitary measures to cook school meals and save time.

Shifting from firewood, solar electricity is used to cook but also to refrigerate fresh foods and power water pumps to irrigate school gardens with harvested rainwater or filter it to be used for drinking. School cooks have been trained on safe and hygienic food preparation practices. This has been extended to parents and people in the community, also by using digital screens and including educational information on nutrition, hygiene, health environment and other positive social behaviour change messages. Containers prevent the use of more expensive bricks and

cement which are major sources of CO2 and provide a safe structure in an earthquake-prone country.

Scale-up potential

To meet the current needs, identified together with the Ministry of Education, WFP plans to install KIAB in 700 schools. This will provide safe and environmental-friendly school kitchens and improve the nutrition of more than 500,000 children every year. The expected lifespan of kitchens is 15 years, therefore, the number of total estimated beneficiary children will be 7.5 million. With the total cost of about US\$20 million over a period of 5 years, WFP can prepare 100-150 kitchens annually.



GHANA



Target location: Ghana, Kumasi & Sunyani



Key partners: Premium Foods Limited (PFL) and Yedent Group of Agroprocessors, Ministry of Education, Ministry of Food and Agriculture, Ministry of Health and Social Services, UNICEF, Canada



Energy services: Productive uses (production, processing, preservation)



Cost per site (US\$): 3.3 M (grant) + 25 M (commercial loan)



Highlights

- Specialized nutritious food production development in the region. Sales in foreign currency.
- Improved nutrition through fortified foods.
- Economic growth through employment, increased business for smallholder farmers
- Food security by strengthening of local production and across the value chain
- Reduced fossil fuel purchases and CO2 emissions

PLANET-FRIENDLY SCHOOLS:



Overview

As part of the Canada-funded **Enhanced Nutrition and Value Chains** project (2016-2021), WFP invested US\$3.3 million and provided technical support to two local manufacturers of nutritious processed foods in Ghana: Premium Foods Limited (PFL) and Yedent Group of Agroprocessors. These strategic partnerships aimed to promote the growth of nutrient-sensitive food value chains and strengthen the resilience of food systems in the country.

WFP's catalytic grant investment enabled PFL to secure a US\$25 million capital expenditure (CAPEX) business loan from financial institutions to invest in state-of-the-art food processing technology, including a 2 GW solar PV system to power the equipment for Super Cereal production. This reduces operating costs for the facility but also the amount

of CO2 that would have been otherwise emitted if the power had to come from diesel generators.

WFP's technical assistance has ensured adherence to food safety and quality standards, supported packaging development, facilitated compliance with international export and distribution regulations and helped PFL and Yedent develop fortified products for local and regional markets.

The regional flagship Super Cereal is a nutritious product used in the treatment and prevention of malnutrition, especially among women and children. It is made of maize blended with soybeans, fortified with vitamins and minerals and processed into flour. Mixed with water, Super Cereal makes a delicious and easy-to-prepare porridge that provides the recommended daily intake of essential nutrients.





Leveraging WFP's food procurement needs, PFL has been expanding its reach beyond Ghana's borders, bringing specialized nutritious food solutions to those in need globally. Their Super Cereal has reached WFP's country operations in Burkina Faso, Mauritania, Guinea, Afghanistan, Honduras, Cameroon, Gambia, Mali, Togo, Cote d'Ivoire, Congo Brazzaville, South Africa and Madagascar, in a tangible and transformative demonstration of its value.

From 2024, PFL's local corn-soya blend, Maizoya, will be available commercially and potentially at institutional markets such as the Ghana Health Service and Ghana School Feeding Programme. The packaged food will enable school children to have a nourishing breakfast before the day of learning starts. As it only requires hot water or clean, safe filtered water to be prepared, much less fuel is needed compared to cooking a meal from scratch with all the original ingredients.

Yedent's corn-soya blend products, TomVita and TomVita X are available commercially and have also been distributed to vulnerable pregnant and breastfeeding women as part of WFP Ghana's nutrition intervention programmes. They also produce a textured soy protein product for the national school feeding programme and MaiSoyForte, a porridge for persons with TB and HIV through a Ghana Health Service Programme.

WFP's support to PFL and Yedent has resulted in increased productivity, employment and access to markets. The two companies now have a combined production capacity of

38,000 MT of nutritious food per year and provide access to markets for over 20,000 smallholder farmers who sell their produce to the companies through aggregators. Furthermore, 350 people are directly employed and over 50 people are undergoing training and internship programmes.

This catalytic initiative promotes sustainable agriculture, that is powered by cheap, reliable and green energy, contributing to the building of a resilient and climate-friendly food system. Building an inclusive and sustainable agri-value chain model, WFP helps to transform economies and ultimately changes lives.



GUINEA



Target location: Guinea, Kissidougou



Key partners: EnDev (GIZ), Plan International, Ministry of Education, students, teachers, local authorities



Energy services: E-cooking, food preservation, lighting, phone charging



Cost per site (US\$): 32,000 + 7,000 (to build canteens)



Highlights

- Comparative study on cooking with EPCs vs. improved stoves vs. traditional 3-stone fire (baseline)
- Impact of access to cold storage on school menu diversification
- Income generation potential at school level through electricity access (community fridge + phone charging)

PLANET-FRIENDLY SCHOOLS:



Overview

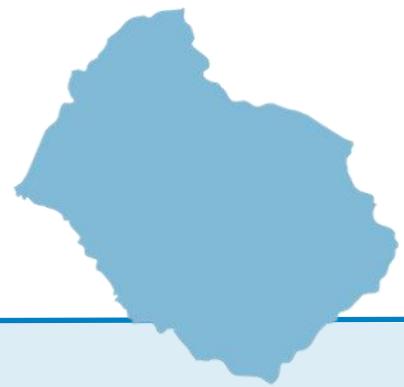
The **Energising Home Grown School Feeding** project implemented in Kissidougou in partnership with EnDev/GIZ and Plan International, is introducing Electric Pressure Cookers (EPCs), improved firewood stoves and refrigerators in two schools. The purpose is to improve the conditions for storing and cooking food, building better working conditions for the women who prepare school meals and reducing environmental degradation and deforestation. Beneficiaries include 260 children and 100 other community members. Plan International focused on the school canteen building infrastructure, EnDev on the energy-related components, and WFP linked the initiative with the school feeding programme, focused on training cooks and conducting data collection for research and learning purposes, with this latter phase still under implementation.

Scale-up potential

WFP has school feeding operations in 870 schools in Guinea. The findings from this pilot can help inform best practices on cooking and preservation techniques that can later be either replicated or support assessments for other technologies to explore. The Government of Guinea funds school feeding programmes in an additional 401 schools, where clean energy solutions could also be implemented for greater impact at the national scale.



LESOTHO



Target location: Lesotho, Maseru



Key partners: Ministry of Education, University of Loughborough (MECS programme)



Energy services: Cooking



Cost per site (US\$): 20,000



Highlights

- Shift from firewood and LPG to E-cooking through introduction of on grid Electric Pressure Cookers
- Evaluation study developed by the MECS

PLANET-FRIENDLY SCHOOLS:



Overview

In 2022, WFP supported the introduction of energy-efficient Electric Pressure Cookers (EPCs) in five Lesotho peri-urban schools in the **Electric Pressure Cookers for Schools (EPC4S)** programme. EPCs significantly reduce energy demand due to insulation, pressurisation and automatic control and are a clean alternative to firewood stoves (used by one of the schools) or gas stoves (used by the remaining three schools). All schools had access to electricity, but none had considered using EPCs before. The pilot project aimed to assess the technical, economic and socio-cultural feasibility of cooking with EPCs in schools, knowing that this would deliver substantial health, environment and gender co-benefits. Cooks were trained to use the new appliances and provided with a cookbook for the school menus and to collect data in cooking diaries (noting food types and time of cooking). Further data were acquired remotely by using electric metres. Data analysis performed by the Modern Energy Cooking Services project of Loughborough University indicated that:

- The introduction of EPCs in schools was compatible with existing power generation infrastructure.
- Liquid Petroleum Gas (LPG) stoves used up to four times and firewood stoves more than ten times as much energy as an EPC. Consequently, the cost of cooking per student per day using an EPC was approximately one third the cost of using LPG, and one sixth the cost of using wood fuel.
- Not requiring supervision while cooking, EPCs saved time as cooks were able to multitask. EPCs were also at least 20 percent faster than other cooking solutions

(and considerably more compared to firewood) and washing needed less time and water (absence of soot deposits and burned patches of food).

- The introduction of EPCs did not affect diets and provides a safer environment than other cooking solutions.
- Food waste is reduced with EPCs due to the need to measure ingredients before loading the pot.
- These key findings support the pilot's hypothesis that cooking with EPCs in schools brings good value for money in addition to health, environment and gender co-benefits.

Scale-up potential

A further 1200 schools could be shifted to electric cooking, of which 360 are already connected to the grid and 840 off grid that would need solar PV electricity generation. This would provide clean cooking to 480,000 children.



MADAGASCAR



Target location: Madagascar, Androy, Anosy and Atsimo-Andrefana regions



Key partners: Ministry of Education, students, teachers, local authorities, Elsewedy



Energy services: E-cooking, digital education, water pumping for Irrigation, food processing and conservation



Cost per site (US\$): 70.000 - 250.000



Highlights

- Clean cooking, saving time and drudgery, protecting health and the environment
- Less GHG emissions from cooking
- Access to water for sanitation and for irrigation
- Increased local production of nutritious food, thanks to climate smart agriculture
- Reduced food waste thanks to food processing and preservation equipment
- Digitalization of education, thanks to internet connection, digital boards and tablets

PLANET-FRIENDLY SCHOOLS:



Overview

Madagascar ranks among the top ten countries worldwide most susceptible to disasters triggered by climate change and holds the distinction of being the most cyclone-prone nation in Africa. Its regions suffer significantly from extreme weather events, including cyclones, storms, and droughts.

The **Rapid Rural Transformation (RRT)** initiative represents a strategic partnership between WFP and the Government of Madagascar, designed to catalyze rural development through integrated water-energy-food initiatives. By facilitating access to eco-friendly energy

sources, the initiative strategically targets pivotal areas:

- The modernization of food systems to boost agricultural output and encourage diversification of livelihoods, with a focus on empowering women and youth
- Ensuring reliable and sustainable access to water, energy, and ICT services via renewable resources
- Enhancing rural infrastructure and improving the availability of financial services and agricultural advice
- Fostering the exchange of knowledge and cooperative efforts





The solar hubs have an installed capacity of 25 kWp each, while the battery system has a capacity of 72 kWh. Each solar hub includes a borehole equipped with an electric water pump. The hub is a two-floor structure that is designed to supply energy and accommodate entrepreneurial activities. It also provides a shared space that can serve multiple purposes. One of the spaces is used as a digital classroom, in which a digital board and some tablets are available for students and for professional trainings. The Solar energy hubs are being disseminated across remote areas to serve as foundational units for a wide range of scalable services perfectly tailored to meet the evolving demands of the communities they serve. These hubs are not just mere power sources but catalysts for collaborative ventures and the development of agricultural commerce, enabling local economies to thrive sustainably.

The RRT Initiative is at the forefront of equipping rural communities to withstand the increasingly severe effects of climate change, such as more frequent and intense extreme weather phenomena and the shifting of temperature and precipitation patterns. The initiative focuses on using affordable and reliable solar power to cut down on carbon emissions and support environmentally friendly development.

An emphasis on adopting climate-smart farming techniques like drip irrigation and hydroponics transforms agricultural practices, heightening water efficiency and mitigating drought susceptibilities. Furthermore, by encouraging a broad spectrum of livelihood options, the initiative paves the way for households to reduce their dependence on traditional agriculture, building a resilient front against environmental adversities.

Within the educational domain, the initiative is instrumental in the deployment of digital tools in rural schools. This has facilitated a paradigm shift in rural

pedagogy, with students and educators gaining access to digital devices, internet, e-learning tools and enhanced pedagogical methodologies. This energy transition is pivotal in diminishing the educational disparity observed between rural and metropolitan areas.

Installations in schools have been set up to power electric cooking shifting from traditional biomass-based cooking methods. Refrigeration is another useful service in schools where it can extend the shelf life of perishables and mitigate post-harvest losses contributing to more nutritious meals and better learning. For smallholder farmers on the other hand, refrigeration means better revenues.

Scale-up potential

The RRT project began its journey by implementing a pilot in four locations in southern Madagascar. This initial phase laid the groundwork for expansion and refinement of the project's methodologies. In 2024, 19 new RRT sites will be installed in Madagascar, testing new designs and different installed capacities in various areas of the country. At the same time, new management and business models will be trialled to define a sustainable roadmap for the scale up of the initiative in the country and at regional level.

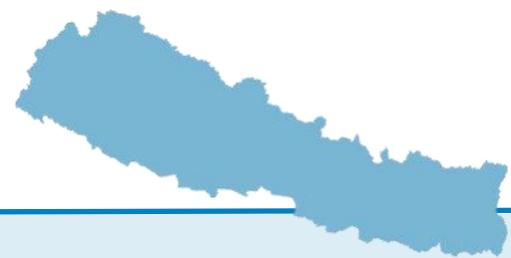
Building upon the successes and lessons learned from Madagascar, the initiative is already branching out to other African nations: in Mozambique with one site, ten sites across the Democratic Republic of Congo and further solidifying its presence with two sites each in Namibia and Zambia.

This geographical spread not only reflects the adaptable nature of the RRT initiative but also highlights WFP's commitment to fostering sustainable rural communities across the southern African region.

The RRT Initiative is a promising example of how climate-resilient rural development can be achieved through integrated approaches powered by access to green energy.



NEPAL



Target location: Nepal, Nuwakot and Sindhupalchok districts.



Key partners: Ministry of Education Science and Technology, Alternative Energy Promotion Centre, Local authorities, schools and private sector.



Energy services: E-cooking, water pumping



Cost per site (US\$): 20,000



Highlights

- Shift to e-cooking (induction stoves and pressure pots) to reduce the use of LPG and firewood, protect health and environment.
- Reduced cost of cooking and lower GHG emissions
- Installation of solar PV systems to power energy services such as cooking and irrigation
- Use of surplus energy for irrigation of school gardens and power electric appliances

PLANET-FRIENDLY SCHOOLS:



Overview

All fossil fuel used by Nepal is imported. Hydropower on the other hand, has strong potential in the country but only less than one percent is currently harnessed. Most households and schools meet their energy needs through biomass, kerosene, petrol and LPG. Biomass is used inefficiently, posing a threat to forest reserves and the environment. The main electricity grid is generally only available in urban and peri-urban areas leaving around 30 percent of the population off grid. The Government of Nepal aims to achieve universal access to electricity and reduce biomass use to 10 percent by 2030 while promoting renewable energy to improve the living standard of rural vulnerable populations and protect the environment. The **Green School Kitchen (GSK)** project, a collaboration between the government, WFP and local authorities, has supported two schools with the installation of solar PV systems to shift from firewood and LPG to e-cooking with induction stoves and pressure pots, for the preparation of school meals. The energy system is hybrid with the possibility to power induction stoves either directly from the school's solar panels, with the solar energy stored in batteries by the inverter or from the national grid. The induction stove operates between 800W to 3.5 kW and can take cooking pots of 30/35 kg. The battery bank has the capacity to supply energy continuously for 2.5 hours. In one school, that currently uses firewood, induction stoves are backed by improved metal rocket stoves to bridge the electricity generation gap during the monsoon season. PV panels need to be cleaned to keep the system operating in ideal conditions. This is estimated to cost the school around 50 US\$ yearly.

Thanks to the intervention, the expenditure for cooking fuel has decreased compared with the purchase of LPG and firewood.

While surplus electricity can be fed back into the grid schools have started to use it to irrigate school gardens two hours a day. The vegetables produced in the kitchen garden are being served in the school meals and the surplus produce is sold in the local market. In addition, some schools are using the energy to operate electrical appliances for 6.5 hours every day.

Scale-up potential

WFP is replicating the project in four additional schools in Bajura districts in Sudur Paschim Province. Additionally, in collaboration with the Ministry of Education, Science and Technology WFP plans to improve cooking facilities with induction stoves powered by solar PV in 1,060 schools, benefiting 200,000 children with a total investment of US\$20 million over five years.





Photo credits

Cover: WFP/EI Salvador, Kitchen in a box (KIAB)

Page 2: WFP Children's Design Competition 2003, Armenia, Arevik

Page 3: WFP/Alaa Noman, Yemen. Workers pack WFP fortified wheat flour at a mill in Aden Governorate

Page 4: Left: WFP/EI Salvador, Kitchen in a box (KIAB) ; Right: WFP/Irene Nduwayezu, School feeding in Burundi

Page 5: Top: WFP/Anna Eriksen, Ethiopia. Solar-powered irrigation in Somali region; Bottom: WFP/Brian Wanene, Kenya. Hydroponic farming in Kenya's Urban areas

Page 6: WFP/Lesotho, Electric Pressure Cookers for Schools (EPC4S)

Page 7: WFP/Armenia, Transformative Schools Feeding Model

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CLIMATE AND DISASTER RISK REDUCTION

World Food Programme

Via Cesare Giulio Viola 68/70,
00148 Rome, Italy - T +39 06 65131

wfp.org/energy-for-food-security

raffaella.bellanca@wfp.org