Feeding Futures:

The importance of clean cooking for home-grown school feeding

The challenge

The act of cooking poses serious consequences for the health, wellbeing, and economic potential of millions of people worldwide—as well as for the environment and climate. Cooking is intrinsically linked to food security, as people require safe, efficient, and environmentally sustainable ways to prepare nutritious food. In 2024, 638–720 million people faced hunger, including 73 million children.[1] At the same time, 2 billion people relied on open fires or basic stoves.[2]

Schools are an essential source of nutrition for many children through home-grown school feeding (HGSF) programmes, which help provide schoolchildren with safe, diverse, and locally-sourced nutritious food.

With most school feeding programmes catering for large numbers and relying on inefficient biomass stoves, schools are estimated to be the second-largest consumers of biomass energy after households.[3] Often, the responsibility falls on families to collect or buy cooking fuel. This creates time and financial pressures that can negatively impact children's school attendance, performance, and ability to meet other basic needs.[4]

Cooking smoke is a major source of indoor air pollution linked to approximately 3.7 million premature deaths a year at the household level.[5]

Cooking generates around 1.2 Gt CO_2-eq globally, roughly equal to the combined CO_2 emissions from international aviation and shipping.[6]

Harvesting trees for firewood and charcoal can lead to environmental degradation.

While specific data on the impacts of cooking in schools is limited, studies have shown that pollution levels often exceed World Health Organization (WHO) air quality guidelines. Catering staff (primarily women) experience cooking-related health issues, and smoke can disrupt teaching during cooking periods.[7]

1 World Food Programme (WFP), 2025, The State of Food Security and Nutrition in the World (SOFI) Report
2 IEA, 2024, Universal Access to Clean Cooking in Africa: Progress update and roadmap for implementation
3 ESMAP, 2023, The State of Cooking Energy Access in Schools: Insights from an Exploratory Study
4 WFP and MECS, 2022, Clean and Modern Energy for Cooking: A Path to Food Security and Sustainable Development
5 IEA, 2024, Access to clean cooking – SDG7: Data and Projections – Analysis - IEA
6 IEA, 2024, Universal Access to Clean Cooking in Africa: Progress update and roadmap for implementation
7 ESMAP, 2023, The State of Cooking Energy Access in Schools: Insights from an Exploratory Study

Focus on clean cooking in schools has increased in recent years, with key actors[8] including the public sector, non-governmental organisations (NGOs), financiers, and private sector providers of large-scale cooking equipment and clean fuels. However, schools face several barriers when transitioning to clean cooking:

- **Limited resources to invest** in cooking solutions, which often require significant upfront costs.
- **A lack of kitchen infrastructure**, including designated spaces for cooking, food storage, and food preparation.
- **Hesitancy around perceived risks** of new technologies, given the limited flexibility in how and when meals are prepared.
- **Fragmented decision-making** across multiple stakeholders can delay or obstruct the adoption of new solutions.
- **Limited data and understanding** of the costs and benefits of clean cooking in schools, alongside low awareness of the risks associated with traditional cooking methods.
- **Insufficient after-sales support** may result in stoves not being used if technical issues arise.

Recommendations

School feeding can be made more sustainable through clean cooking technologies, renewable energy for institutional kitchens, and sustainable biomass management in rural and remote areas. These solutions can lower harmful emissions, reduce fuel use and costs, boost local job creation, and minimise environmental impacts, all while protecting the health of cooks and children.

Whilst several options exist, the choice of cooking system depends on cost, fuel availability, school size, number of meals prepared, local and system capacity, and acceptability.

A number of measures are needed to encourage the adoption of cleaner cooking solutions in schools, scale their use, and maximise their benefits. These include:

- **Context-specific data and evidence** to help decision-makers understand available cooking options and their costs and benefits.
- **Policies and quality standards** around school feeding and institutional clean cooking to create the enabling environment for replication and scale.
- **Continued innovation** to ensure cooking solutions and associated financing products meet their needs.
- **Finance for schools** to purchase clean cooking solutions and equipment suppliers to invest in business growth. Carbon finance could generate revenue for institutional cooking solutions, but understanding its viability is important.
- **Sustainable biomass management, agroforestry, and reforestation strategies**, particularly in rural and remote areas.
- **Support schools to become community hubs** for spreading clean energy and nutrition awareness.

School cooking options

Improved biomass cookstoves provide higher efficiency and reduce firewood consumption.

Liquified petroleum gas (LPG) offers a clean and fast way to cook, significantly reducing cooking time and air pollution.

Electric cooking technologies, such as induction stoves and electric pressure cookers, are a low-emission solution where reliable electricity is available.

Biogas systems convert organic waste into methane for cooking and can be especially effective in farming communities or schools with access to livestock.

Biomass briquettes, made from feedstock like sawdust or bagasse, can serve as an alternative to firewood.

Steam-powered cooking solutions are a cost-efficient way to cook large quantities of food. Steam is produced using fuels such as briquettes, electricity or LPG.

SNV's place in the puzzle

To meet national school feeding and clean cooking ambitions and commitments, governments, donors, and technical stakeholders need trusted partners who can:

1. Deliver quality technical assistance and reliably implement innovative programmes.
2. Maintain long-standing relationships with government institutions, communities, and market actors.
3. Assist key actors across the school feeding and clean cooking ecosystem, encouraging effective policy development, implementation, coordination, and long-term sustainability.
4. Help strengthen local energy systems and market-driven development approaches.

SNV endeavours to fulfil a role in this capacity. We are a well-established partner with decades of experience advancing sustainable, locally led energy and food systems. Our expertise in renewable energy, agriculture, nutrition, and systems strengthening supports the adoption of clean cooking while advancing broader school feeding and climate goals.

[8] Including World Food Programme, Sustainable Energy for All, Modern Energy Cooking Services Programme, Children's Investment Fund Foundation, Rockefeller Foundation, and Food4Education.

We have been active in the clean cooking sector for over 30 years. In 2024, our clean cooking portfolio covered 14 countries in Africa and Asia and contributed to more than 2.1 million people gaining access to improved clean cooking solutions.

Together with local partners, SNV provides comprehensive implementation assistance, including:

- **Supporting piloting, data collection and roll-out** of clean cooking solutions to build the evidence base and create conditions for scale.
- **Designing and implementing financing mechanisms** for suppliers and consumers of energy products.
- **Facilitating awareness and behaviour change** communication activities to shift attitudes and perceptions of traditional and clean cooking.
- **Providing specific GESI interventions** to increase the inclusivity of markets and associated policies and enhance joint decision-making around energy choices.
- **Enabling a conducive and inclusive clean cooking environment** through advocacy, policy and standards development, knowledge sharing, capacity building, coordination, and multi-stakeholder engagement.

SNV collaborates with organisations and programmes[9] that draw on our technical expertise, multi-stakeholder facilitation, and private-sector engagement to implement clean-cooking market development activities.

Building on national-level experience, we scale impact through knowledge sharing, evidence generation, and networking. We also bring clean cooking and school feeding priorities, expressed by local voices, to global platforms.

SNV combines know-how, networks, and lessons learned from household clean cooking with our growing experience in institutional cooking to strengthen insights and impacts for clean cooking in schools.

Our approach goes beyond government engagement. We involve communities and families in programme design and implementation, and work with the private sector to develop sustainable, market-oriented solutions.

By integrating our expertise in agriculture, nutrition, energy, and water, SNV works with partners to develop strategies for clean cooking and school meals that compelment existing health, social protection, and education systems.

[9] This includes Energising Development (EnDev), the Modern Energy Cooking Services (MECS) Programme, Netherlands Enterprise Agency (RVO), Foreign, Commonwealth and Development Office (FCDO) UK, the World Bank, and National Governments.

Our experience

SNV has a growing portfolio supporting the implementation of improved and clean cooking solutions in institutional settings. Examples include:

- Supporting Ugandan institutions' transition to clean cooking solutions through the Inclusive Markets for Energy Efficiency in Uganda (IMEU) Market Development Fund.
- Conducting institutional stove assessments in Kakuma Refugee Camp, Kenya, repairing degraded biomass cookstoves, and piloting electric pressure cookers with schools and other institutions.
- Assisting local organisations in Ghana to advocate for clean cooking in schools through the Voice for Change Partnership.
- Piloting improved institutional biomass stoves in Lao PDR and supporting the development of a national strategy for electric cooking. This involved school surveys and policy recommendations.
- Contributing to institutional cooking technical committees, working groups, and communities of practice.

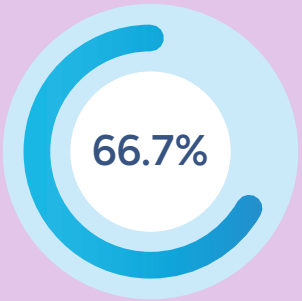
The case of Sanyu Babies Home in Uganda

Sanyu Babies' Home is a not-for-profit care provider that supports babies and children and aims to reunite them with their families. The home received a catalytic grant from SNV's IMEU Market Development Fund to de-risk their investment in a solar-powered energy system. This powers electric pressure cookers and lighting and uses solar thermal collectors to provide hot water, reducing operational costs and enhancing both supply and environmental sustainability. These innovations have lowered reliance on traditional fuels and improved living conditions for staff and children.

As Christine Nalwanga, a Home Mother, explained: 'Our cooks are now experts in using the electric pressure cookers. Before, we would take four hours to prepare beans for the children, but now it takes only 30 minutes.'

In partnership with IMEU, 87 social institutions have adopted energy-efficient practices, alongside commercial enterprises like hotels. Improved institutional cookstoves are already being replicated beyond the initial project scope. Kasese Secondary School recently installed six improved institutional cookstoves after observing positive impacts at St. Lucia High School, an IMEU project partner.

Firewood and charcoal expenses in the kitchen reduced from **UGX 600,000** to just **UGX 50,000.**



Electricity costs were reduced from an average of **UGX 1,500,000** to just **UGX 500,000.**

In partnership with **IMEU**, 87 social institutions have adopted **energy-efficient technologies and practices**, as well as commercial enterprises like hotels.

Kasese Secondary School reported approximately **62% energy cost savings**, directly contributing to providing nutritious meals for **1,500 students.**

Advancing energy-efficient cooking in Kakuma[10]

In 2023, SNV conducted an institutional e-cooking pilot with the MECS programme, supported by Energising Development (EnDev) and UK Aid. It took place in Kakuma Refugee Camp and the Kalobeyei Integrated Settlement, where more than 50 social institutions relied on firewood, consuming up to 100 metric tonnes each month.

The pilot introduced 40-litre solar-powered electric pressure cookers (EPCs) to reduce firewood use, lower operational costs, improve health outcomes, and assess the scalability of EPCs as a sustainable cooking solution.

It also compared the cost of cooking with firewood and electricity. Findings indicated significant savings when electricity was used. For meals like beans and githeri, which are commonly prepared in Kenyan schools, cooking with electricity was at least 50% cheaper than using an improved institutional stove with firewood. Cooks also appreciated the time saved, lower water use, and cleaner working environment. They reported less eye irritation when using the EPCs.

While several benefits were observed, the pilot highlighted that the type of meal and number required were also important factors in determining the most suitable cooking appliance.

Our vision

SNV's school feeding vision aims to work with partners to expand school feeding across East Africa and enable **10 million children** to access healthy meals by 2030, improving educational outcomes and reducing short-term hunger.

Sustainable energy and water solutions, including clean cooking, are a central pillar of this vision. We work with governments and other partners to integrate clean cooking into regenerative, home-grown school feeding models that connect schools to local markets and smallholder livelihoods. This approach ensures that school feeding is more than a meal. It creates stronger education systems, healthier environments, and more resilient local economies.

To accelerate this impact, SNV is actively seeking partners who share our vision. Together, we can support schools to adopt cleaner cooking practices, lower costs, safeguard the health of children and staff, and protect local environments, all while inspiring a new generation of energy champions.

Through government-led frameworks, community action, and regional collaboration, our partnerships scale proven solutions, unlock innovation, and mobilise diverse financing—so every learner can benefit from nutritious food and a brighter future.

[10] Further details can be found in the case study in Khalifa, Y., Leach, M., Sieff, R., Nsengiyaremye, J., Onjala, B., Groen, K., Fuso Nerini, F., Ramirez, C., and Bellanca, R., 2025, The role of electric cooking in providing sustainable school meals in low-income and lower-middle-income countries, The Lancet Planetary Health, 9(11).

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SNV is a mission-driven global development partner working in more than 20 countries across Africa and Asia. Building on 60 years of experience and together with our team of over 1,600 people, we strengthen capacities and catalyse partnerships that transform the agri-food, energy, and water systems, which enable sustainable and more equitable lives for all.

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SNV Impact that matters