


Call “FENV” “Food environments for improved nutrition”

NaviNut - Enhancing Women’s Agency in Navigating Changing Food Environments to Improve Child Nutrition in African Drylands

country/countries	Benin, Kenya	
funding agency	Federal Ministry of Food and Agriculture - BMEL	
project management	Federal Office for Agriculture and Food – BLE	
project coordinator	German Institute for Tropical and Subtropical agriculture (DITSL)	
project partner(s)	South Westphalia University of Applied Sciences, Faculty of Agriculture (SWUAS) Prolinnova – PROmoting Local INNOVAtion in ecologically oriented agriculture and natural resource management University of Parakou (UP), Faculty of Agriculture, Benin University of Abomey-Calavi (UAC), Faculty of Agriculture, Benin Center for Research and Development in Drylands (CRDD), Kenya Tropical Institute of Community Health and Development (TICH), Kenya Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya	
project budget	1.485.890,41 Euro	
project duration	9/2020 – 12/2024	

key words	food environments, food choice, child nutrition, nutritional status, dietary diversity, local foods, traditional food products, packaging, marketing, eye tracking, food quality, food safety, local knowledge, peer learning, nutritional education, agency, innovation, positive deviance, actor-oriented, action funds, participatory action research, transdisciplinary research.
background	There are two main reasons for the often insufficient effectiveness of nutrition interventions in drylands: a) the lack of understanding of why dietary recommendations (e.g. increased dietary diversity) are not adopted by mothers, and b) the lack of a year-round supply of high-quality, nutrient-rich foods in drylands. Both aspects emphasise the need to better understand the 'personal nutritional environment' of mothers.
objective	<p>NaviNut aims to empower women in their various roles in nutrition, food production, and health, and to help them navigate changing food environments.</p> <p>NaviNut's main objectives are to</p> <ul style="list-style-type: none"> a) understand the complexity and dynamics of women's nutritional decision-making in child feeding practices, including their purchase and consumption criteria; b) contribute to designing healthy food environments by increasing accessibility, convenience and desirability of locally available, highly nutritious traditional food products (TFPs) with emphasis on consumer communication in order to nudge healthier purchase and consumption decisions; c) Improve community health services by developing appropriate nutrition dialogue models that are better adapted to the needs of mothers.
results	<p>In this transdisciplinary research project, we employed participatory action research methods, collaborating with mothers of children under five, local female small- and micro-food processors, and community health workers as co-researchers.</p> <p>1. Mothers' food environments, feeding decision-making and practices</p> <ul style="list-style-type: none"> • In Benin, among the Fulani, Gando and Bariba, food decisions are often made collectively due to polygamous family structures and the common practice of meal sharing within neighbourhoods. Consequently, mothers do not have full decision-making power regarding their children's nutrition. • In Kenya, mothers' personal food environments vary by location and are influenced by climatic, ecological, socio-economic, cultural and infrastructural conditions. Consequently, similar foods are rated differently by mothers in different locations with regard to accessibility, affordability, convenience, healthiness and child acceptance. Food frequency questionnaire results showed that these ratings are reflected in children's dietary intake. Frequently consumed foods were rated highly across three or more of these key characteristics. • Accessibility affects all characteristics, with accessible foods typically being more affordable and sometimes more convenient. Moreover, children are

more likely to accept foods they are frequently exposed to.

- Although mothers aspire to provide healthy food for their children, their ability to do so largely depends on what is accessible and affordable. Stressors such as drought can severely disrupt accessibility and affordability, further affecting child feeding decisions and practices.
- Mothers engage in various routine actions relating to child feeding, hygiene promotion and child development in order to achieve their overarching goal of raising healthy children. Despite facing challenges such as feeding difficulties, delayed developmental milestones and poor maternal nutrition during pregnancy, they act as resourceful problem solvers. However, their agency is often constrained by contextual factors such as time limitations, lack of support and poverty.

2. Innovative practices and positive deviance in child nutrition

- A high number of positive deviant practices were identified with regard to mothers' and children's nutrition, as well as other childcare-related issues. These include the use of herbal teas to enhance breast milk production and cure child illnesses, stimulate children's appetites by rotating foods and using certain herbs, and implementing a variety of hygiene practices related to personal care, food, water and the environment.
- Selected recipes used by positive deviant mothers in Benin—such as *Dibou kpé sari* (a sorghum dish with *Urena lobata* leaves), *Idouwarè* (sorghum, cowpea, and peanut sauce), *Dambu* (a cereal-based staple with *Senna obtusifolia* leaves), and *Kobsa* (cowpea with cowpea leaves)—showed high macro- and micronutrient content, including protein and iron, and met recommended dietary reference intakes.

3. Improving the quality and safety of traditional food products (TFPs) through enhanced processing, packaging and marketing.

- Across both countries, over 90 local and traditional food products were identified and approximately 20 were analysed for their nutrient content. Foods processed using local techniques such as fermentation and germination were found to have particularly high micronutrient content.
- In Benin, women and local processors selected four TFPs to be improved in collaboration with nutritional scientists. Improvements included adding nutrient-rich ingredients such as baobab and moringa, and refining processing methods to reduce nutrient loss.
- To enhance food processing practices, a hygiene and safety guide was developed in Benin. This was used during a three-day training course for 19 local female processors, during which they gained theoretical and practical skills in producing the improved TFP.
- In close cooperation with the women's groups involved, appealing, target-group-oriented packaging designs were developed for both Kenya and Benin. Using eye-tracking as an objective method of recording visual perception enabled us to identify key design elements that increased the attractiveness of the infant formula produced in the project. These included the visual presentation of the ingredients and the depiction of a mascot appeal-

ing to parents and children. In Kenya, visual elements signalling quality, such as the KEBS certificate or a 'health claim', also increased appeal.

- The marketing concepts were developed in collaboration with the women's groups. It was repeatedly shown that only some of the test subjects were willing to pay enough to cover the production costs, so the targeted selection and addressing of new target groups also appears to be of great importance. It could also be considered to create a range of packaging sizes targeted at specific groups, as a higher willingness to pay was indicated for smaller packaging units.
- With the help of action funds, 17 women's groups in Kenya and Benin were supported in setting up and expanding local food production and processing businesses. This included training experts and experienced local business owners/groups in business management.

4. Improving nutrition education through appropriate dialogue models, such as peer learning.

- After assessing existing nutrition education modules and identifying gaps, context-specific training manuals and curricula for teaching behaviour change were developed in collaboration with stakeholders.
- A package of measures was developed and piloted, including stakeholder-centred methods such as peer learning by innovative mothers, culinary food exchanges, participatory experimentation, and the development of innovations with the support of action funds. This was well received by the mothers for its cultural relevance and practicality.
- In Kenya, experienced mothers passed on their knowledge to younger mothers through peer-to-peer training. They used their own photos (from a photovoice activity) as teaching materials as part of a special breastfeeding support initiative.
- Local innovations, positive deviant practices, and behaviour change messages were documented in Kenya and Benin using various tools, such as films, participatory videos, animated videos, photos, audio, radio messages, and printed documents. Local actors used these tools to disseminate knowledge within the peer group.
- Participation in these learning activities helped women to build confidence and improve their communication skills. Young mothers gained confidence in adopting shared practices relating to breastfeeding, complementary feeding, hygiene, and child development.
- • In Benin, expert mothers set up a child nutrition screening and education centre, using jointly improved local methods to assess the nutritional status of children under five.
- Peer learning and women-led knowledge dissemination extended to the broader community: 300 peer learning sessions were conducted with approximately 3,000 women in Benin, and a series of radio programmes co-produced by women reached around 60,000 listeners.
- Female small- and micro-food processors obtained training in business operations and marketing. They promoted their products at trade fairs, gain-

	<p>ing valuable experience in entrepreneurship and market engagement. These businesses increased the accessibility of nutritious local child foods, improved women's incomes and led to greater social cohesion as groups continued to collaborate and learn from one another.</p>
<p>recommendations</p>	<ul style="list-style-type: none"> • Best practices can be obtained by studying the knowledge and practices of experienced mothers, which can then be incorporated into customised interventions to improve child nutrition in different contexts and conditions. Such interventions that respect and incorporate cultural practices, and that involve community peers in peer-to-peer learning processes, are more acceptable and feasible. • Promoting the use of local and indigenous foods improves children's nutritional intake and creates income-generating activities for local micro and small enterprises, which are often women-owned. Such initiatives build on existing cultural knowledge while simultaneously closing nutrition gaps. • There is a need to integrate information on TFP production into local health and nutrition education programmes. This includes collecting recipes for nutritious children's food and creating a manual for complying with hygiene rules during production. • A multifaceted approach that considers socio-economic factors and strengthens support systems can empower mothers to promote their children's well-being effectively. Therefore, it would be useful to link livelihood support programmes with nutrition interventions. For example, this could be achieved by strengthening self-help groups and improving access to financial resources in order to improve food systems through sustainable production, processing, and value addition. • Improving market access by developing infrastructure and storage facilities is critical to improving child nutrition, particularly in remote dry areas where limited access to perishable food remains a major challenge. • Develop guidelines and institutionalise funding for measures to support the development of local food systems. This approach is promising for promoting innovation at the community level, improving food systems and strengthening community resilience. • As for educational institutions, students should be trained in transdisciplinary research and participatory methods that facilitate the integration of local knowledge and innovation capacities.
<p>photos</p>	<div data-bbox="443 1570 911 1877">  </div> <p>Two-day food fair event in Marsabit County. Women exhibiting local child foods. <i>Photo by Jamal Omar.</i></p> <div data-bbox="1002 1570 1461 1877">  </div> <p>Finhoracha women group learning from Kayolaidha women group during a cooking demonstration in Marsabit, Kenya. <i>Photo by Jamal Omar.</i></p>



Cooking demonstrations of improved TFPs in Benin. *Photo by: Paul Jimmy.*



Training on hygiene in the local production of nutritious foods. *Photo by: Adrien Dogo.*



Nutrition screening center in Benin. *Photo by: Cherif Issifou*



Photovoice and consultative workshop in Marsabit, Kenya. *Photo by: Zulekha Abdulkadir.*



Rendille women storyboarding during a participatory video training in Kenya. *Photo by Regina Jalle.*



Co-production of radio programs in Benin *Photo by Ilimath Lafia*



Example of packaging design for locally produced healthy infant formula in Benin



Example of images of infant porridge packaging used in Kenya.