Bundesministerium
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FEMOZ: Strengthening the Resilience of Rural Food Environments in the Context of Disaster Risk and Climate Change in Mozambique

Subproject of the Frankenförder Forschungsgesellschaft

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project coordinator	Institute for Technology and Resources Management in the Tropics and Sub-tropics (ITT) Technical University (TU) Cologne
project partner(s)	Institute for Information Science (IWS), TU Cologne; Frankenfoerder Forschungsgesellschaft (FFG); Faculty of Arts and Social Sciences and Faculty of Agronomy and Forest Engineering, University Eduardo Mondlane (UEM), Maputo; University of Rovuma, Nampula; Technical Secretariat for Food Security and Nutrition (SETSAN), Maputo; National Institute for Disaster Management (INGD), Maputo; Network of Food Sovereignty Organizations (ROSA), Maputo; Rural Association for Mutual Aid (ORAM); Maputo; Solar Power Stores, Maputo
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key words	Food environment, food and food security, disaster management and prevention, vulnerability, markets, food system
background	Mozambique is one of the poorest countries in the world and one of the countries most at risk from natural disasters. The food and nutritional situation is extremely precarious. 54% of families cannot afford a diet that meets their minimum nutritional requirements (World Bank, 2022). In addition to the high rates of chronic and acute malnutrition, non-communicable diseases are on the rise as a result of changing eating habits. Both problems pose a serious challenge for the country's weak healthcare system. Apart from low diversification of agricultural production and low productivity (Carrilho et al., 2016; World Bank, 2018), other factors influence people's interaction with their food environment and thus food consumption and food security.
objective	The aim of the project was to strengthen the resilience of rural food environments in Mozambique in the context of climate change and disaster risks. To this end, the various dimensions of the food environments (Turner et al., 2018; FAO, 2016) that influence food security and nutrition should be better understood and measured in the study areas (Districts of Ribaue, Buzi and Moamba, see fig. 1). The creation of an information base and awareness-raising should bring about changes that contribute to improving food security and nutrition.
results	**Value chains**: In all three districts, most of the agricultural produce is sold unprocessed; the cash crops (cashew, pineapple, bananas) directly to wholesalers. The exceptions are maize and manioc, which are ground in Ribaue for national sale, and fish from Buzi, which is dried and sold supra-regionally. In order to minimise transport costs, the vehicles are overloaded; rules for hygiene and good practices to prevent transport damages are not respected. Product flows are dynamic; changes in direction and volume depend on local production, local/ supra-regional demand, shelf life and transportability of products as well as prices at different levels. The main actors in the value chains for agricultural products are farmers, 'small' salespersons, who often organise the transport of goods themselves, and traders (wholesale, grocery shops). Processed products find their way into local consumer habits via traders. The storage of food products by grocers is limited. This is due to the low local demand and the need of grocery stores to minimise risks. In the event of extreme climate events, the low level of storage contrib-

utes to supply bottlenecks and a sharp short-term rise in prices. These spikes usually normalise as soon as the affected areas are again accessible. The number and diversity of intermediaries ensures quick and flexible reactions to restrictions caused by crises, e.g., by purchasing from other regions.

Markets: Market types range from daily centralised markets with competing shops and stalls to occasional 'marketplaces' in remote villages with limited offer. In general, a distinction can be made between 'supplier markets' at provincial and regional level and local 'consumer markets'.

Tab. 1: Characteristics and customers of the different market types

Type		Customers	Characteristics
Consumer market (local)	rural	farmers low population density	low demand low number of sellers and low product diversity
	urban	residents with income from agriculture and non-agricultural activities	higher purchasing power higher number of vendors and greater diversity of food products
Supplier market (regional)		passengers (main roads; train route); middlemen/vendors (for local markets) local residents	higher number of vendors greater diversity of food products (occasional) connections to other markets
Supplier market (Province) - Wholesale market		intermediaries/sellers (for the above-mentioned regional and local markets) population of the Province	determines reference prices for the entire Province frequent price fluctuations warehouses and wholesalers supra-regional product flows

The most important markets are located along main transport routes and contribute to the regional distribution of products. The importance of the markets depends on (a) their location in relation to important traffic flows, (b) the quantity of goods going abroad and (c) local demand. Traders obtain their goods for the smaller local markets from the large regional supplier markets.

With the exception of a few model markets, the infrastructure of all markets is inadequate: storage facilities or cold storage rooms are lacking, electricity is available but expensive, making storage complex and costly. Sanitary facilities are insufficient or dysfunctional, running water is the exception, and hardly any market has facilities for washing products. The drainage of the markets and waste disposal are inadequate. All of this combines to an unhealthy environment for handling and selling food. Despite that, food borne diseases are not frequently reported.

Convenience and desirability: Access to fresh food is limited, especially in remote areas, due to low and not very diverse supply. Usually, fresh products are bought daily in the neighbourhood, unless they are covered by own production. Quality and safety problems with fresh products reduce their attractiveness (desirability) - and make them more time-consuming to prepare (convenience). Pre-packed processed products are attractive because they can be easily stored and transported. There is a wide offer of cheap, unhealthy convenience foods with low nutritional value in the study districts. These are consumed frequently. Ready-made products with low nutritional value (e.g., biscuits) often replace whole meals. Although more expensive convenience products with a higher nutritional value are available, they are rarely bought due to their price. A change in eating habits is taking place due to the preferences and wishes of children and young people.

Prices and affordability: Spending on food is low in all districts. Most families spend less than the cost of a basic food basket. Food prices are generally regarded as high and play an important role in purchasing decisions. They oscillate with the seasons. There is no price control, supply and demand determine the price - in particular the regional reference markets, trading places for the majority of products. Important factors influencing prices are the accessibility of the districts, petrol prices and competition between drivers. Any deterioration of the roads often as consequence of extreme weather events, has a major impact on consumer prices.

Extreme weather conditions: The study districts are affected by different extreme weather phenomena: Cyclones, heavy rainfall and flooding in the coastal region regularly destroy houses, fields and infrastructure in the District of Buzi and thus local livelihoods and food sources; decreasing and erratic rainfall in the District of Moamba slowly but steadily reduces the yields and diversity of crops and the composition of meals.

Strategies for adaptation and prevention: In the event of water shortages, the regions are focussing on income diversification, adapting cultivation methods using water-saving techniques, salt and drought-resistant seeds and, to some extent, preserving and processing of products. There are also initiatives to collect rainwater. Disaster preparedness plans and structures are in place at all levels for hurricanes and their effects. At the regional level (which covers several provinces), food reserves are maintained, search and rescue teams are on standby, as are mobile medical teams. The activities of the first 72 hours have to be organised by the districts and communities themselves with their Disaster Risk Management (DRM) Committees and limited food reserves. However, there is no organised stockpiling of basic foodstuffs on district level.

	Interinstitutional coordination: INGD is the central authority for disaster risk management and has employees in every province. These provincial representatives have contact persons in the districts who chair the intersectional local operational DRM committees. Food security is not the primary focus of INGD: it prepares the ground - through alerts, preparedness, first aid, surveys - for later interventions carried out by government agencies, (I)NGOs or private actors. INGD provides the coordination framework within which the UN-led clusters and short and longer-term donors can and have to integrate. INGD is involved in the provincial platform for the coordination of food security (COPSAN), where it can liaise with SETSAN, the secretariat for food security, and the Ministry of Agriculture. In practice, the system is judged to be too cumbersome and sometimes inefficient. While the exchange between the departments works reasonably well at district level, the districts criticise that INGD responds inadequately and sometimes not at all to their alerts and needs. The activities of INGED and the short and medium-term aid have a small but important influence on product prices by increasing the availability of certain (basic) foodstuffs (food reserves and distribution; restoration of access to cut-off areas) and thus help to curb price spikes. **Approaches to price stabilisation:** Mozambican policy towards prices is rather reactive and primarily seeks to avoid social unrest. There are some instruments to control price speculation, which are intended to prevent price excesses in the event of a disaster. There is no tax policy that systematically intervenes in food prices to influence the eating behaviour of the population, e.g., by taxing unhealthy foods (with the exception of tobacco and alcohol). Taxes on processed food are levied to protect the local food processing industry - which is criticised as insufficient, as import duties are systematically circumvented by products brought into the country illegally. There are several programmes to promote the consumption of staple foods through subsidies aimed at supporting vulnerable groups, but programmes to promote healthy diets are rare. The programmes under the National Social Action Strategy attempt to link the issue of food subsidies to healthy eating but face numerous limitations in their implementation. **Food security and nutrition policy:** Policy plays a key role in creating a healthy food environment. The results of the 'Food Environment Policy Index' (Food EPI) adapted to the realities of the Global South show that the institutionalisation of food and nutrition security measures is supported by a number of political decisions. However, there are challenges in the implementation and monitoring of policy measures, the harmonisation and coordination of sectoral policies, the adaptation of the legal framework and budget planning in relation to international recommendations. **Utilisation of the results:** FEMOZ and within it FFG contribute to systematic dissemination of applied methods and approaches. In addition,

	results are incorporated into processes on food environments in Mozambique: • Master's programme on disaster risk management and food security at the University of Rovuma • Development of a training course on the evaluation of food security and nutrition policies • Input for the formulation of food policy strategies • Methodological input for the monitoring of policies in the area of food security and nutrition • Regional scientific exchange • Development of open online courses on food environments and wild food plants (neglected or underutilized species – NUS) • Development of a summer school on food security and nutrition in the context of disaster risks • Impulses to evaluate food security and nutrition policies in the context of disaster risk in the Science-Policy-Interface (SPSI) • Policy Briefs with concrete recommendations **Dissemination of the results:** The methodological approach, research results and the derivation of policy recommendations were discussed in the context of living labs, events, and society-policy interfaces, among others: • International conference 'Rural food environments: Challenges for a better food security and nutrition in the context of climate change' in February 2024 in Maputo (book of abstracts at www.femoz.de) • Symposium 'Rural food environments: Challenges for a better food security' in September 2023 in Maputo • Workshops (SPSI) on food security and nutrition policies in September 2023 in Maputo and Nampula and in February 2024 in Maputo • Symposium 'Rural food environments in the context of climate change' in September 2022 in Maputo Information about FEMOZ and various reports, scientific articles and policy briefs can be found at www.femoz.de.
recommendations	• Instigate improvements along the value chains and in sales and storage conditions in the markets to increase food quality and safety and sensitise sellers and consumers. • Better implement and monitor existing food safety regulations, taking into account the competitiveness of the products; improve communication and coordination between relevant government agencies and cooperate with sectors (private sector, universities).

- Continue with and expand nutrition education in schools with the establishment of school gardens and sensitisation to healthy eating.
- Promote access to and affordability of high-quality fresh agricultural products and the supply of nutrient-rich finished products (financed, for example, by taxes on unhealthy food as in Hungary).
- Create incentives for the reformulation of food to reduce the content of problematic ingredients: ranging from raising consumer awareness to voluntary agreements by the food industry and government regulations.
- Complete the development of Food Based Dietary Guidelines as a basis for public measures in the area of food and nutrition (health, agriculture, education, etc.), taking into account non-conventional foods (NUS).
- Increase awareness, information and education of consumers on healthy eating through campaigns, promotion of studies on eating habits and effects on nutrition. Cooperation with the catering sector should be initiated.
- Adopt a multisectoral and inclusive approach to promote public procurement of food from smallholder farmers. Integrate the topic into strategic plans and government programmes; expand the capacity of rural extension services in the areas of raising awareness on healthy nutrition and advising smallholder farmers to participate in public procurement.
- Improve storage facilities to reduce post-harvest losses and in the event of a disaster.
- Establish a cross-sectoral monitoring system in the area of food security and nutrition for reliable and up-to-date data for the formulation of context-appropriate policy measures.
- Establish a platform/forum/council on food security and nutrition with representatives from various ministries, civil society, academia, donors and the private sector (in addition to the National Council for Food Security - CONSAN). This could be complemented by an academic think tank.
- Expand preventive measures to promote healthy eating in order to prevent further overburdening of the health sector through diet-related non-communicable diseases. This must not be at the expense of measures to combat undernutrition. One starting point are the so-called ‘double duty actions’.

photos

fig. 1. Rural sales stall (Erik Engel, FFG)

fig. 2. Small grocery shop (Erik Engel, FFG)

fig. 3. Market in Buzi (Christine Bohn, FFG)

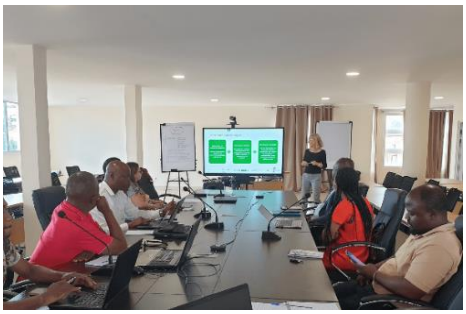

Abb. 4. Food EPI-Workshop (Christine Bohn, FFG)

Abb. 5. Mixed offer on the market (Christine Bohn, FFG)

Abb. 6. Fresh fish on offer at the market (Christine Bohn, FFG)

Abb. 7. Dried fish on offer at the market (Christine Bohn, FFG)

Abb. 7. Fresh vegetables on offer at the market (Christine Bohn, FFG)