



**BAOFOOD
PROJECT**



Collaborative product development to enhance local food security and livelihoods in Eastern Africa

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1. Introduction

- The BAOFOOD project (2016-2019) aims to promote the domestication, production, market development, processing and consumption of baobab (*Adansonia digitata* L.) for the improvement of food security, nutrition and rural livelihoods in Kenya and the Sudan
- The project's ultimate goal is to establish a community-based processing unit in Kenya to produce and supply highly nutritious baobab products for home consumption and local and regional markets
- Such community-based enterprises (CBE) developing new products can considerably contribute to local food security, employment, alternative household income and improved livelihoods
- This poster aims to present the project's approach in more detail, whereby new products are collaboratively being developed instead of the sole effort of an enterprise

2. Methods

- Approaches and concepts from the food product development and community-based enterprise literature have been reviewed
- A survey (N=120) has been conducted in Kilifi county/ Kenya in the community, in which the baobab processing CBE shall be established to assess current practices, knowledge gaps and training needs
- Knowledge which is currently being generated within the BAOFOOD project feeds into the product development process. Activities include:
 - Morphological characterisation and inventory of baobab trees;
 - Analyses of nutrient composition and bioactive compounds of raw baobab fruits as well as processed products;
 - Assessment of nutritional status and food preferences of households;
 - Market and producer studies.

3. Preliminary results

Steps in food product development [1]	Conditions faced by the BAOFOOD project	Proposed BAOFOOD approach
Product strategy development	Initial screening <ul style="list-style-type: none"> Study area characterized by food insecurity and malnutrition, as well as low levels of socio-economic development [2] Target group for the baobab product already defined in project proposal (population groups particularly vulnerable to malnutrition and food insecurity, such as school children, female headed households, rural poor) 	<ul style="list-style-type: none"> Survey of current uses and available products based on baobab as well as existing local and indigenous technologies and processing techniques or approaches
	Preliminary market assessment <ul style="list-style-type: none"> Majority of rural households recognise baobab as a food source; but only few harvest and/or process it [2] There are only few processed baobab products locally available (e.g., Mabuyu, home-made baobab porridge and juice), and rural populations are mostly not aware of more sophisticated product concepts (such as baobab cake, biscuit, sweets, ice cream) [2] 	<ul style="list-style-type: none"> International markets not in scope because of higher requirements in terms of product quality/ certification and much higher marketing effort required Hypothesis is that basic shelf-stable products that involve dried fruit pulp and the seeds for the local market are most appropriate
	Detailed market research <ul style="list-style-type: none"> Much smaller budget available compared to commercial product development projects 	<ul style="list-style-type: none"> Analyses of nutritional status and food habits, rural and urban consumer preference surveys, as well as market and producer studies underway
	Product concept development <ul style="list-style-type: none"> Product concept and technologies need to be locally reproducible and cost-effective There is no cold chain locally available Much smaller budget available compared to commercial product development projects 	<ul style="list-style-type: none"> Several easy-to-produce products with locally available technology in which baobab is combined with other local food (e.g. fruits, cereals, etc.) Products should be shelf-stable at ambient (elevated) temperatures Participative design: Community members, project team, and associated stakeholders jointly develop product concepts
Product design and process development	Financial feasibility study <ul style="list-style-type: none"> Profit-making not the most important motive, but some return is necessary to ensure sustainability of the product [3] NGO and project partner 'Wild Living Resources' currently promotes further CBEs in the community (e.g., charcoal, mushrooms) 	<ul style="list-style-type: none"> Existing synergies with other CBEs in processing and marketing shall be exploited
	Prototype design <ul style="list-style-type: none"> Locally available levels of knowledge and technology of baobab processing relatively low [2] To reflect the needs of various target groups, a set of possible products shall be established [cf. 3] 	<ul style="list-style-type: none"> Main processing steps to be considered are cracking the fruits, removing and grinding the pulp for different types of further processing, e.g., biscuits, bread, bars, instant powder for drinks or sauces, spreads
	In-house testing <ul style="list-style-type: none"> Much smaller budget available compared to commercial product development projects 	<ul style="list-style-type: none"> Members of the CBE will test product prototypes
	Consumer testing <ul style="list-style-type: none"> Baobab often locally considered as 'poor people's food' [4], consumer acceptance needs to be achieved 	<ul style="list-style-type: none"> Limited consumer tests will be performed with members of the target groups
Product commercialisation	Scaling-up <ul style="list-style-type: none"> Establishment and construction of community-based processing unit core part within the BAOFOOD project Community awareness and motivation generated through previous project activities as well as ongoing efforts of NGO 'Wild Living Resources' in the community 	<ul style="list-style-type: none"> Purchasing of processing equipment (e.g., stirring and grinding equipment, rolls, ovens, etc.), adaption of existing equipment if possible Training courses on technology and food safety issues (hygiene, quality control, ...) for local community Technical advice from baobab entrepreneurs during scale-up and implementation
	Trial production <ul style="list-style-type: none"> Limited know-how for baobab processing within community [2] 	<ul style="list-style-type: none"> First production of finally selected baobab-products in community with assistance of project team, trainings
	Market test <ul style="list-style-type: none"> Baobab often locally considered as 'poor people's food' [4], consumer acceptance needs to be achieved 	<ul style="list-style-type: none"> Product testing within the community
	Pre-launch business analysis <ul style="list-style-type: none"> Limited knowhow for business development within community 	<ul style="list-style-type: none"> Advice and experience of successful baobab processors connected to project to be sought
Product launch and post-launch	Production start-up <ul style="list-style-type: none"> Expertise for baobab processing and upscaling of production limited within community [2] 	<ul style="list-style-type: none"> Collaboration with existing baobab processing companies if useful
	Market launch <ul style="list-style-type: none"> Much smaller project budget compared to commercial marketing campaigns 	<ul style="list-style-type: none"> Low-cost outlets and collaboration with civil society partners, e.g., school feeding programs
	Post-launch operational and financial analyses <ul style="list-style-type: none"> Attainment of local economic and social development, community mobilization and environmental preservation more important than profits [3] 	<ul style="list-style-type: none"> Successful creation of the CBE may have spill-over effects and inspire establishment of entrepreneurial activities elsewhere [cf. 3]

References

- Winger R & Wall G (2006): Food product innovation: a background paper. FAO, Rome
- Tunje JG, Maina A, Nyori J, Pole M (2016): Information and needs assessment of baofood production and utilization in Kilifi county. Unpublished project report.
- Peredo AM, Chrisman JJ (2006): Toward a Theory of Community-Based Enterprise. Academy of Management Journal, 31(2):309-328
- Chikamai B, Eyog-Matig O, Mbogga M (eds) (2006): Review and appraisal on the status of indigenous fruits in Eastern Africa, A report prepared for IPGRI-SAFORGEN in the framework of AFREA/FORNESSA, IPGRI (International Plant Genetic Resources Institute) SSA, Nairobi, Kenya

4. Conclusion

This more unconventional product development pathway gives local baobab processors, often characterised by limited resources and expertise for product and business development, the opportunity to develop nutritious baobab products collectively in a project setting. It is increasingly recognised that successful product innovations and market success depends strongly on collaboration and stakeholder involvement.

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