

Diet diversification through local foods: experiences from traditional vegetable promotion work in Kenya

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Introduction: Poverty, nutrition and health situation in Sub-Saharan Africa

Micronutrient deficiencies, particularly those of vitamin A, iron and zinc are a major contributing factor to poor health in many rural and urban communities in Sub-Saharan Africa (SSA). Vitamin A deficiency, for example affects an estimated 42 percent of the population in the region (UN University, Food and Nutrition Bulletin, 28:1, 2007 and 26:4, 2005). A Global Progress Report by UNICEF and the Micronutrient Initiative (2004) estimated that the prevalence of iron deficiency anaemia among pre-school children was 60% and those suffering from Vitamin A deficiency at 70% in Kenya. This situation is compounded by: 1) Poverty: 46% of the population in SSA is living on less than a dollar a day – (World Resources 2005), 2) Low agricultural output which has been trailing behind population growth for most of the last three decades (FAO, 2002), 3) Disease – especially HIV/AIDS and Malaria 4) Increasing incidences of chronic nutrition diseases (obesity, diabetes, cardiovascular diseases, high blood pressure and cancer) as more and more people move to cities – where they depend more on the relatively cheaper high energy foods. UN-HABITAT projects the continent's urban population to double by 2030 (UN-HABITAT report Nov 2008). While some of the deficiencies are the result of inability to access adequate healthy food, this paper postulates that another significant contributing factor is people's preference for a narrow range of often nutritionally-poor foods and intentional avoidance of certain locally available traditional foods. Bad choice of food is often associated with attitude and stigma for certain foods compounded by underdeveloped tastes for such foods and lost knowledge of their use. In all cases a major outcome is inadequate intake of micronutrients.

Opportunities: Potential of under-utilized genetic resources in Africa

Nearly 40,000 native African plant species are a source of local food and fodder, medicine, perfume, fibre, wood for building and so on. It is estimated that one out of every ten of these is used locally for food including snack. Kenya with a flora of about 7,000 has about 850 food plants and twice as many with medicinal use – and almost all are under-utilized, under-researched and under-developed. Although the majority of these are minor plants, with little chance of contributing significantly to food supply, a few have a high chance.

African Leafy Vegetables and Fruits

Leafy vegetables may form as much as 20% of local edible plant species in Sub Saharan Africa.



The spider plant is important in East and Southern Africa. More than 10 African nightshades and as many amaranth species are used in SSA. These are among the most promising vegetables.

Though introduced mainly for other purposes, crops such as cassava, sweet potato, pumpkin, and cocoyam (taro) leaves are now leading sources of vegetables.

Due to innovative cooking and selection processes by farmers, specific vegetable varieties have been developed.

Fruit vegetables constitute the second most important class of vegetables. The horny cucumber and African eggplants are examples.

A high vegetable diversity is associated with traditional farming systems

Rural people in Kenya use an enormous number of local vegetables (210 species recorded) in the wild and cultivated land. The high diversity is associated with traditional farming and resource management systems as well as a rich indigenous knowledge e.g on preparation and health effects. Many of these systems have however been disrupted, leading to loss of agrobiodiversity and knowledge of their use as well as their resilience. These vegetables however have not received much attention in marketing and research. High diversity can be used to improve dietary diversity and to meet economic needs of the household.

Why local food resources?

- 1) Source of income
- 2) Locally adapted
- 3) Source of good nutrition
- 4) Source of breeding material
- 5) Potential for new crops, foods and food products
- 6) Social and cultural value
- 7) Conservation of plant genetic resources and associated traditional knowledge of use
- 8) Dietary diversity




These resources are also locally available, affordable and local knowledge and expertise among local communities exist.

Local vegetables are good sources of micronutrients, pro-vitamin A, vitamin C, folate, iron, calcium and fibre.

Phase I (2004-2006): Promoting research and consumption of African vegetables – the case of Kenya

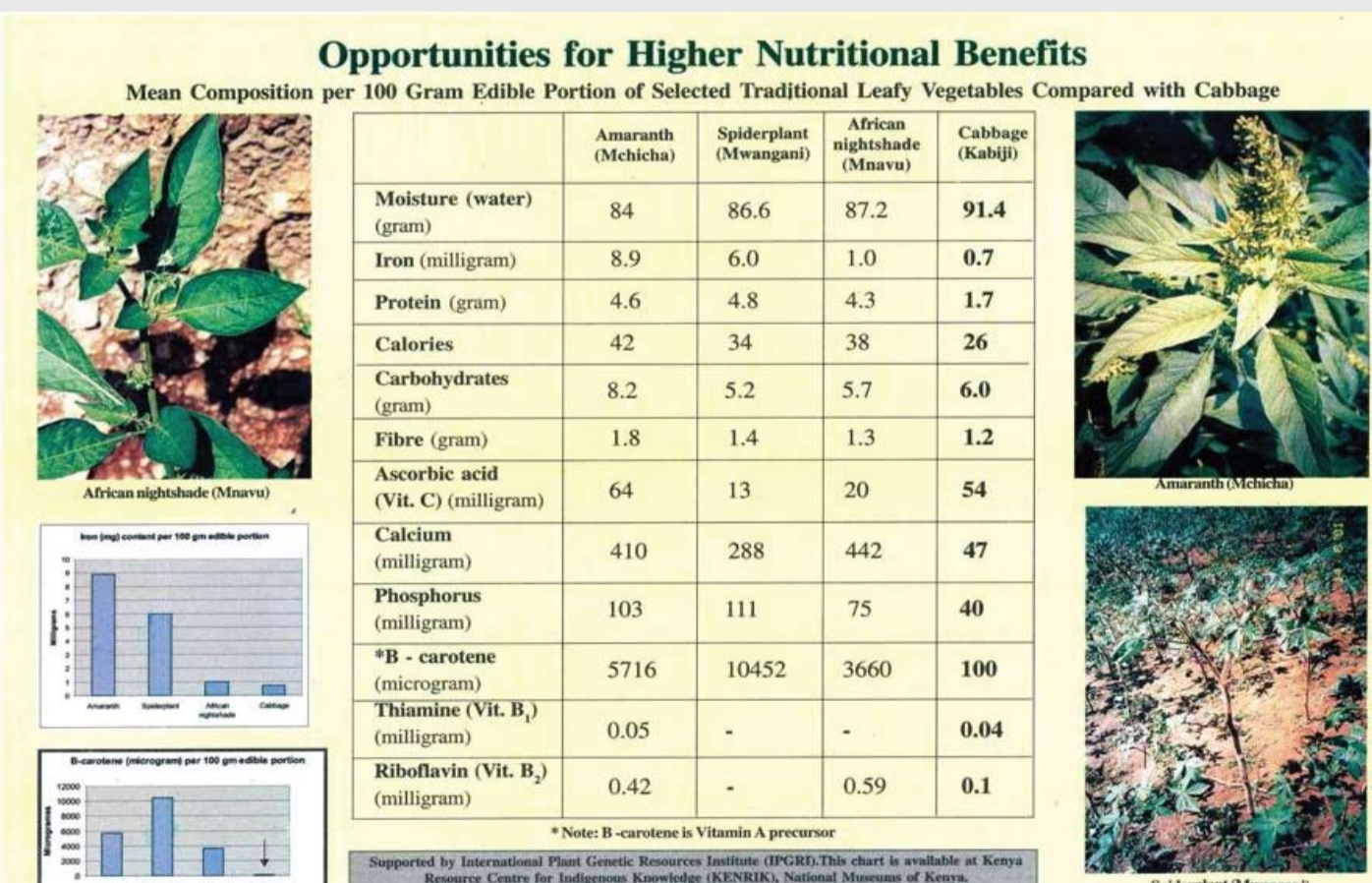
Through IDRC support, a team of research and development organizations in Kenya, led by Bioversity International undertook to improve research consumption and marketing of local vegetables. The aim was to enhance incomes of rural and peri-urban farmers, preserve the vegetable biodiversity and to enhance the nutrition and health status of consumers. To achieve this, the project had to improve seed systems, build capacity of farmers to grow local vegetables, document recipes and disseminate them. Among the key activities were linking farmers with supermarkets and grocery stores and conducting promotional and awareness campaigns.



Street campaigns in Nairobi, 2004.

Mean Composition per 100g Edible Portion of Selected Traditional Leafy Vegetables Compared with Cabbage	Spinach (Spinacia)	Spinach (Spinacia)	Spinach (Spinacia)	Cabbage (Brassica)
Moisture (water) (gram)	84	85.6	87.2	91.4
Iron (milligram)	8.9	6.0	1.0	0.7
Protein (gram)	4.6	4.8	4.3	1.7
Carbohydrates (gram)	42	34	38	26
Fibre (gram)	8.2	5.2	5.7	6.0
Ascorbic acid (Vitamin C) (milligram)	64	13	20	54
Calcium (milligram)	410	288	442	47
Phosphorus (milligram)	103	111	75	40
Protein (milligram)	5716	10452	3660	100
Thiamine (Vitamin B1) (milligram)	0.05	-	-	0.04
Riboflavin (Vitamin B2) (milligram)	0.42	-	0.59	0.1

The team built capacity of farmers to grow and market the vegetables in city markets. Simultaneously it conducted promotional campaigns and created awareness about the value of the foods.



Public awareness material showing high nutrient content of local vegetables.

Results

In 2006, three years after the launch of the campaign, significant increase in production, marketing and consumption of local vegetables was recorded in the city of Nairobi and surrounding regions. Attitudes changed, consumption increased as demand increased, markets improved and seed systems were improved. Weekly gross value in Kenya shillings was about 1 million US Dollars (6,910,571 Kenya Shillings: 2006) up by 100% from 2001. 53% of sellers cited increased demand as the reason for coming into the business (Source: Irungu et al 2007).

Gaps noticed in phase I

Despite the huge success, a few questions however remained unanswered:

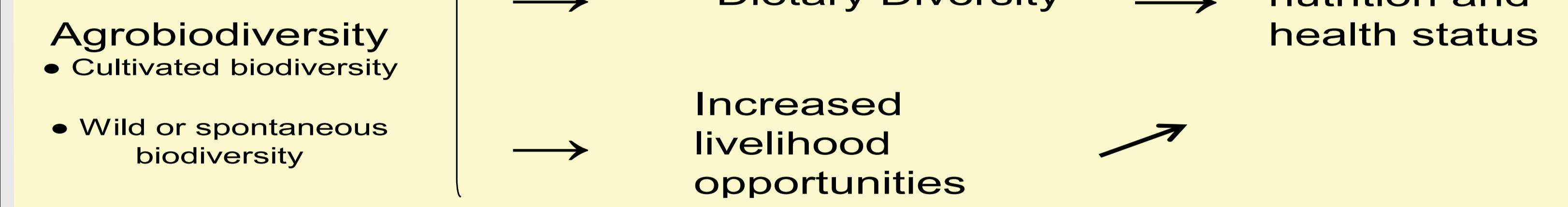
What evidence is there to show that agrobiodiversity affected dietary diversity and health or nutrition status?

What can be done for agrobiodiversity to contribute more to health and nutrition status in poor rural and urban populations?

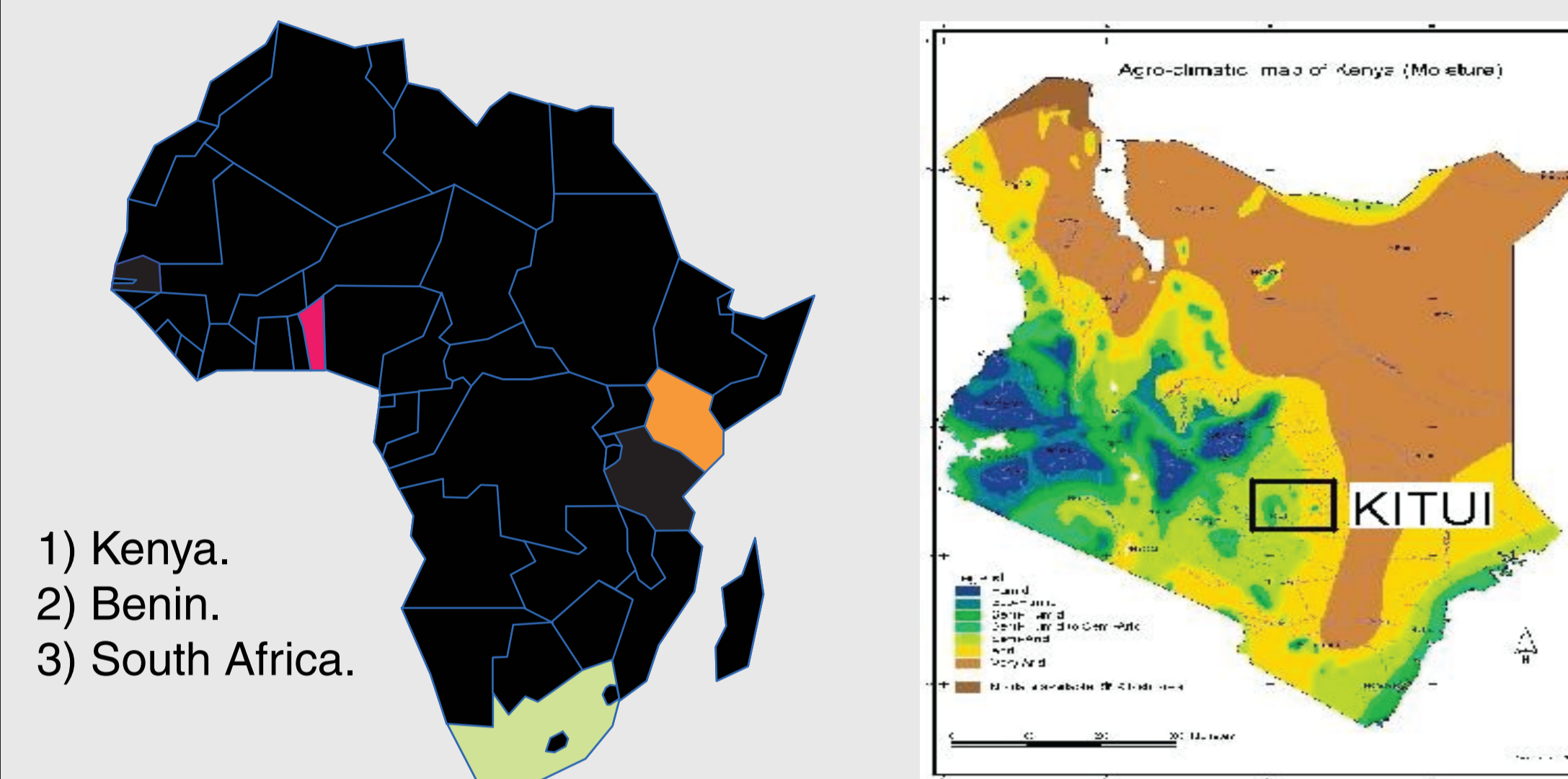
Phase II (2008-2010): An initiative to find the link between agrobiodiversity, dietary diversity and nutrition status/health

A project to investigate answers to these questions was initiated in early 2008. Using an ecohealth approach, the project aims to demonstrate the importance of agrobiodiversity in ensuring dietary diversity and improved nutritional status at the household level.

Conceptual Framework of the Second Phase



Study Area: 3 countries in SSA



- 1) Kenya.
- 2) Benin.
- 3) South Africa.

In Kenya, Kitui District, in South Africa, North West Province and in Benin, Mono and Couffo regions are selected as the project sites.

In Kenya, Kitui district is located in the Eastern Province. The area is generally dry (450-1000mm annual rainfall) and has varied topography (690m -1600m). It is occupied by the Kamba people who grow crops and also keep livestock (photos below).



A seasonal river (rain season).

A homestead in Kitui.

The highland parts have a humid climate.

Ox-drawn ploughs are a common way of turning the soil.



A dry river bed.

Drawing water from a sand well.

Hilly part of the project site.

The people in Kitui.

Methodology

Comparative research using a rural community (ecosystem) and an urban community.

- 1) Baseline research (socio-economic status, rural-urban linkages, environment health/ biodiversity, diets, nutrition and health status)
- 2) Controlled intervention/ mitigation and monitoring of outcomes/changes
- 3) Evaluating outcomes of interventions and drawing policy and other recommendations



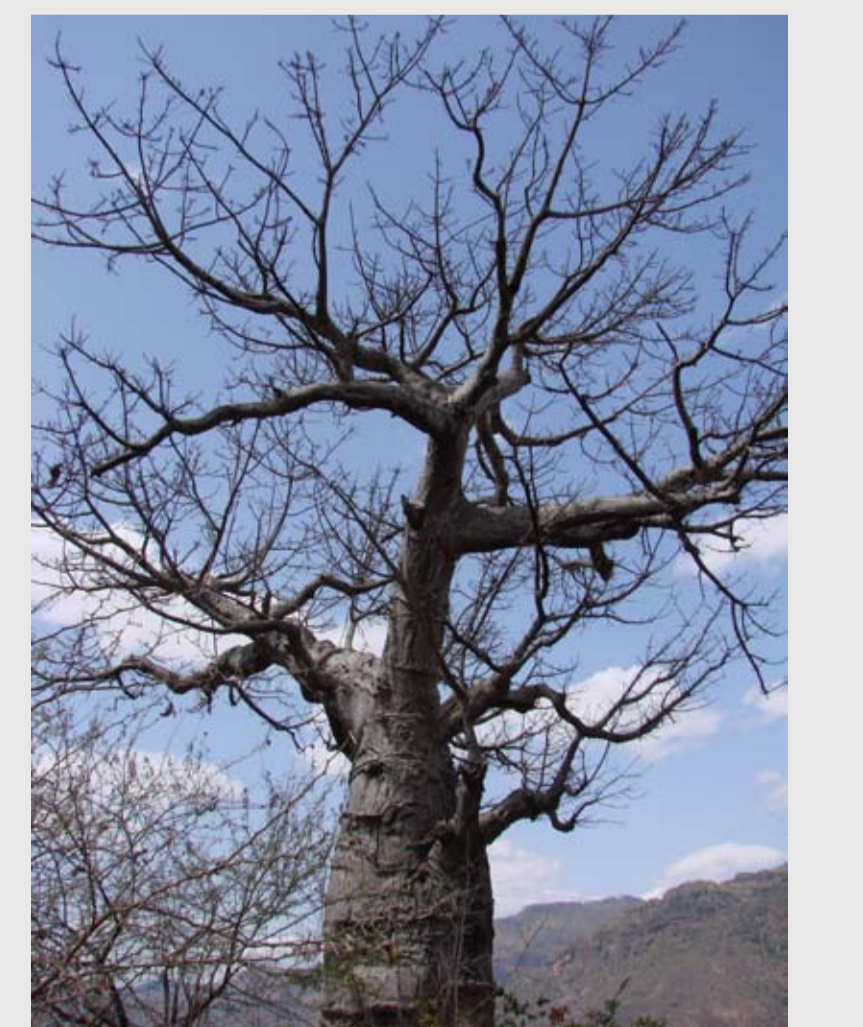
Taking height measurements of children under 5 years and anthropometric measurements of their mothers.

24-hour recall and 7-day food frequency interviews.

Harmonizing the method of interviewing.

What changes are we looking at?

- 1) Agricultural biodiversity at household / village level.
- 2) Health of the local ecosystem e.g Level of land degradation
- 3) Biodiversity
- 4) Knowledge distribution
- 5) Dietary patterns at household and target populations
- 8) Health and nutrition status (Vit A status, Iron status (in de-wormed population), Morbidity as recorded in local clinics and General health status as determined by anthropometric measurements
- 7) Marketing: Availability of local foods in markets
- 8) Socio-economic status: Incomes at household/ group level
- 9) Access to and availability of agrobiodiversity
- 10) Behavioral changes e.g. restaurants, schools, hospitals serving local food and initiatives by farmers to protect environment/ conserve agrobiodiversity



A baobab tree.

Conclusion

Africa's micronutrient problems may be alleviated significantly through dietary approaches that advocate for diversification of diets and which maximize on the use of locally available foods and particularly fruit, vegetable and animal products. Phase I of this project engaged in vegetable research and promotion in Kenya and it was a typical case of how local foods can be turned into an enterprise, raising farmers incomes and improving dietary diversity in urban and production areas. The current phase is using an EcoHealth approach and aims to establish the link among agrobiodiversity, dietary diversity and nutrition and health status.

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