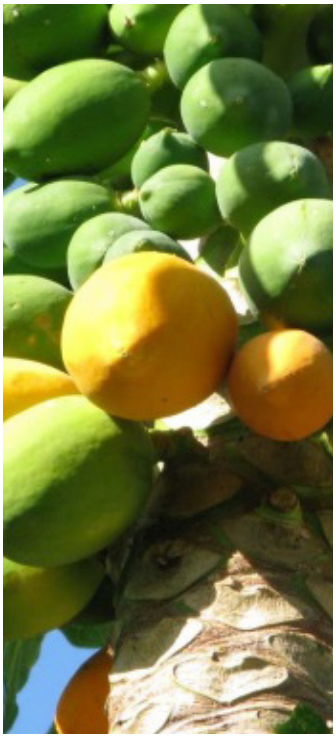
World Agroforestry Centre

IFAD
Investing in rural people

Food trees for diversified diets, improved nutrition, and better livelihoods for smallholders in East Africa



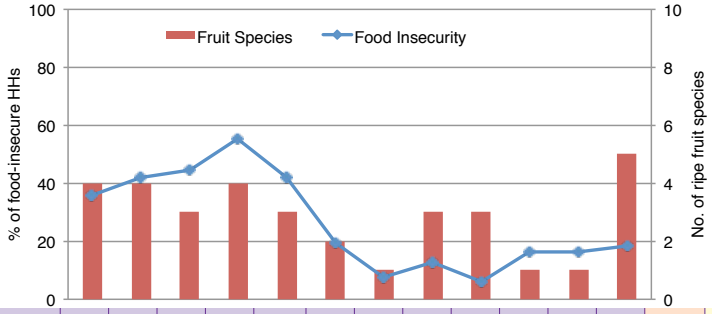





Food from trees have an important role to play in diverse diets. Food trees produce a variety of healthy, nutrient dense foods including fruits, leafy vegetables, nuts, seeds and edible oils. They increase the nutritional quality of local diets, mostly due to their micronutrients (mineral and vitamins), but also macronutrients (protein, carbohydrates). In addition to their direct nutritional and food value, trees in diverse agro-ecosystems provide products (e.g., medicines, timber, fodder, fuel) and services (e.g. carbon sequestration, erosion control, watershed management, soil fertility, wild biodiversity conservation) contributing to the resilience of resource-constrained households.

To incorporate fruits for increased consumption in more diverse diets, while addressing the challenges of seasonal food availability, the World Agroforestry Centre (ICRAF) developed the *fruit tree portfolio* approach. Used to select ecologically, socio-cultural and nutritionally suitable fruit tree species for production on farms. These portfolios are defined as combinations of indigenous and exotic fruit tree species that can be harvested consecutively and potentially provide year-round nutritious fruits, to fill specific food insecure periods and fill 'nutrient gaps' in diets (Figure 1).



English name	Species name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Vit A	Vit C
Mango	*Mangifera indica*	■	■	■	■	■								+++	+
Lemon	*Citrus limon*	■	■										■		+
Orange	*Citrus sinensis*	■	■										■		+
Passion	*Passiflora edulis*	■	■										■	+	
Pawpaw	*Carica papaya*			■	■	■	■							+++	+
Jackfruit	*Artocarpus heterophyllus*			■	■	■									(+)
Avocado	*Persea americana*			■	■				■	■	■				
Guava	*Psidium guajava*				■				■	■	■	■	■	+	+++
Loquat	*Eriobotrya japonica*						■	■	■	■				+++	
Custard apple	*Annona reticulata*								■	■					(+)
Chocolate Berry	*Vitex doniana*												■	+++	
	Available vitamin C and A- rich fruit species	4	4	3	4	3	2	1	3	3	1	1	5		

- Each month at least 1 fruit species is ready for harvest, even during the 'hunger gap'
- (Pro) vitamin A and C supply possible year-round if the 10 species recommended are grown on one farm
- The portfolio approach recommends the optimum number and combination of ecologically suitable tree species to provide for household food and nutrition gaps year round
- The portfolio can be adapted to include suitable and complementary vegetables, as well as annual and staple crops to provide for a 'diversified diet' approach

Figure 1: Fruit tree portfolios, an agroforestry approach to address food and nutrition gaps. An example of a portfolio from Western Kenya. Fruit harvest months are mapped against food insecurity periods and their nutritional contribution (vitamins A and C) included. Harvest periods of fruits are indicated by purple and green-shaded boxes. Avocado does not contain as high content of vitamin A and C as other fruits in the portfolio; it is included for its 5-month harvest availability and contains other important nutrients, particularly fat content (a 146g portion can provide 21% of Recommended Daily Amount, and in addition, dietary fibre). Source: ICRAF/McMullin, S., Ngethe, E., Gachuiri, A., Njogu, K., and R Jamnadass. 2016. Fruit tree portfolios for improved diets and nutrition in Siaya County, Kenya.

Project

The 'Food Trees' project, funded by EC/IFAD and implemented by ICRAF with partners has adapted the *portfolio approach* to include annual crops, vegetables and food trees. This will deliver diversified diet portfolios for year round consumption of nutritious foods. The approach has now been expanded to three sites in Kenya[1], categorized as semi-arid, where food insecurity and malnutrition are a challenge: Laikipia, Tharaka-Nithi, and Kitui.

The purpose of the project is to generate evidence for how best agroforestry and food trees can be promoted to address food and nutrition gaps based on local needs (ecological, socio-cultural, socio-economic etc, Figure 2). Poor farming communities, especially young women, mothers and children are targeted as beneficiaries of the project interventions.

The project; a) takes a participatory community approach to build evidence and fill knowledge gaps to strengthen farming families capacities to benefit from agroforestry, b) tailors food and nutrition interventions based on the promotion of locally available and culturally acceptable agricultural-biodiversity and, c) focuses on behaviour change to improve the knowledge and awareness of nutrition and beneficial agroforestry practices (Figure 3).

Project approach

1. Site assessment

Household socio-economics, ag-biodiversity on farms and food availability documented.

2. HH and Individual consumption

Food consumption patterns, food insecurity and nutritional status assessed, and nutrition knowledge and dietary practices documented.

3. Food tree and crop portfolios

Ecologically suitable combinations of food trees and crops recommended to provide for year round harvest to fill food and nutrient gaps in local food systems.

4. Tree seeds of nutrition kits

A selection of the portfolio seeds and seedlings disseminated with integrated agriculture and nutrition information.

Figure 2: Diversified diet portfolios for Africa: year round consumption of nutritious foods, an agroforestry approach to addressing nutrition and food gaps

Project outputs and activities

Output 1.0: Short and long nutrition-sensitive food tree product value chains within smallholder farming and food systems documented and bottlenecks identified.

Output 2.0: An Empowering Future Farmers school and community programme implemented in target sites, *Seeds of Nutrition Kits*[2] distributed and nutrition and agroforestry information and skills disseminated.

Output 3.0: Agroforestry-Nutrition Innovation Hubs established and innovative IEC tools developed and used for training and dissemination of agroforestry and nutrition information to reach wider audiences.

Output 4.0: Value added novel food tree product developed and capacity of national partner agents strengthened via advanced training in nutrition-

[1] *With an additional two sites, Kwale and Kilifi pending.*

[2] *Tree seeds of nutrition kits are a selection of site suitable food tree species seeds and seedlings with high nutrition value. The packs are accompanied by the relevant planting and management information while importantly containing, information on nutrition, specific nutrients and their value for human health and improved nutrition. The accompanying information will be disseminated in the appropriate vernacular language for wide distribution in the project sites.*

sensitive food tree product value chains. And enterprise development approaches developed and disseminated for at least one food tree product.

Output 5.0: The project titled *Food trees for diversified diets, improved nutrition, and better livelihoods for smallholders in Eastern Africa* coordinated, partnerships consolidated and findings widely disseminated.

Project outcomes/impact envisaged

Diversified food systems

Diversified diets

Income generated

Women empowered

Stakeholder capacities strengthened

Partnerships established

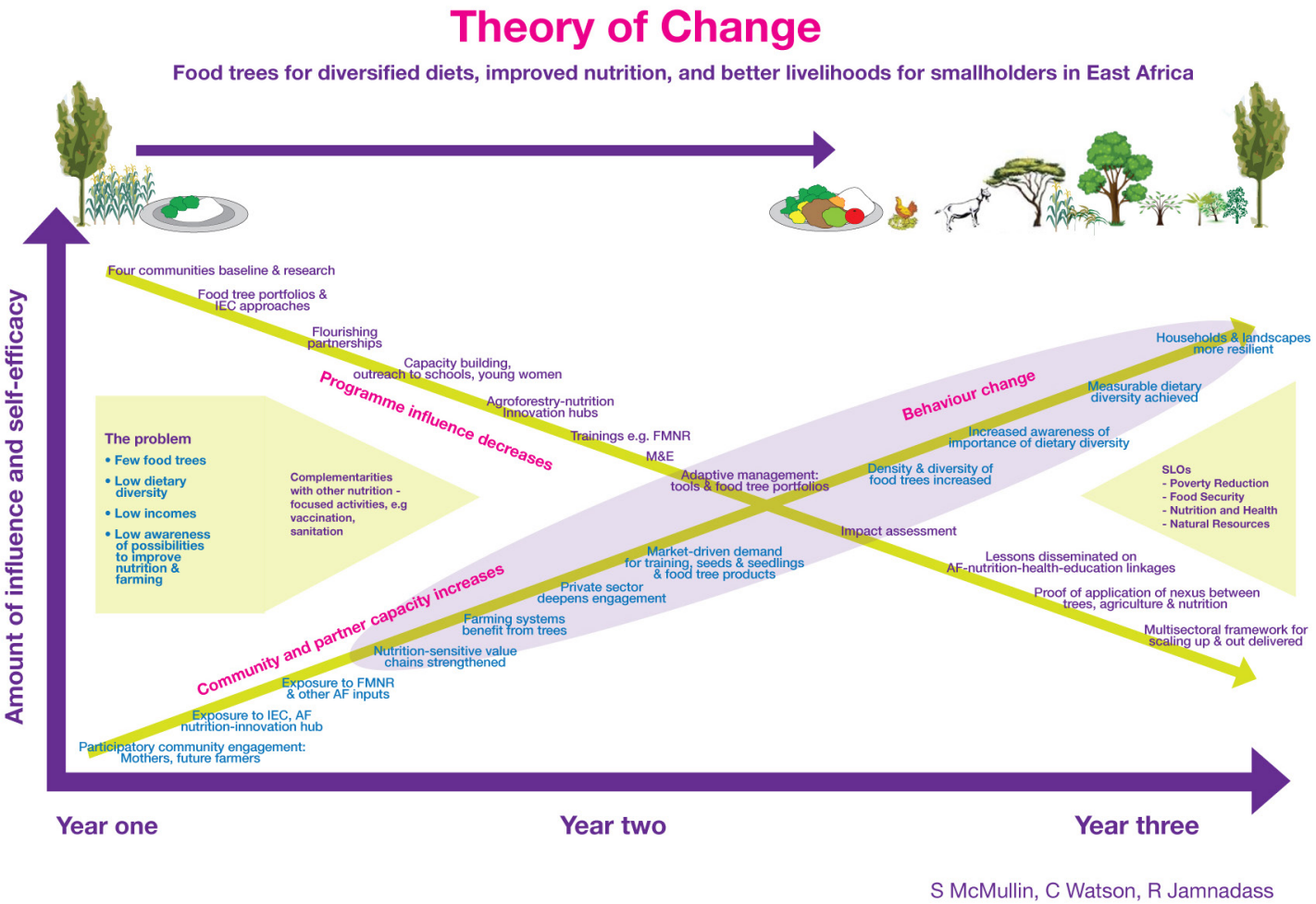


Figure 3: Food Trees Project engagment pathway for impact. Source: ICRAF

The fruit tree portfolio approach was developed in the ICRAF *Food Trees* project, funded by EC/IFAD

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