



# Trees on Farms - Diversity for Nutrition

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RESEARCH  
PROGRAM ON  
Forests, Trees and  
Agroforestry

# Agroforestry – trees on farms



Fodder



Food



Micro-climate



Carbon  
sequestration



Medicine



Fuelwood



Income

PRODUCTIVITY  
& RESILIENCE



Soil fertility



Biodiversity



Erosion  
control

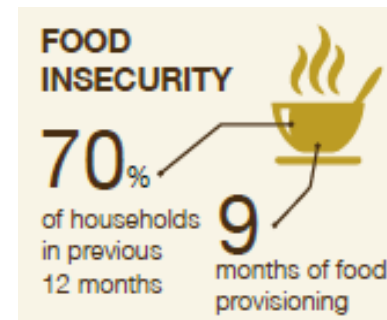
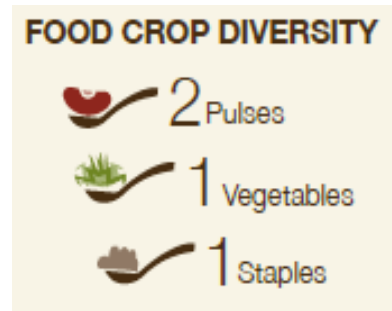
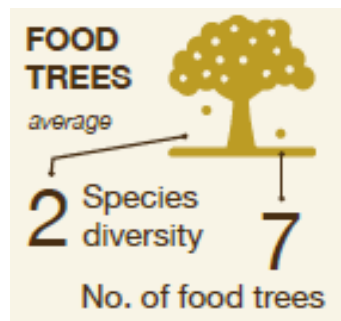


# The *Portfolio* Approach – promoting diversity

These portfolios are combinations of indigenous and exotic food tree, and crop species - that could provide for year-round harvest and address key micronutrient gaps in local food systems.



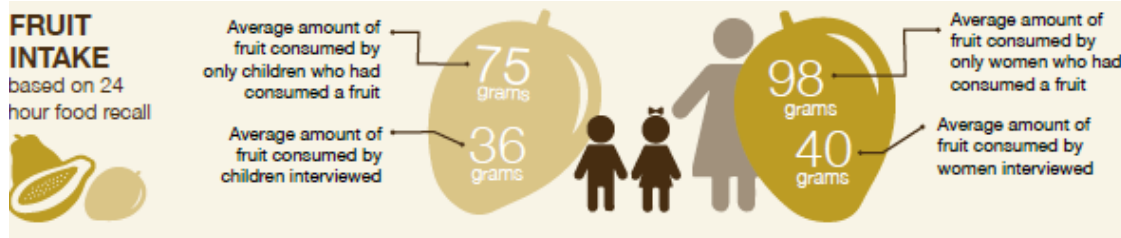
# Generating evidence & priority setting: on-farm food production



\*Food trees: those that provide a variety of nutrient dense foods including fruits, leafy vegetables, nuts, seeds, & edible oils are important in local food systems. \*\* Example data from one site, Kitui West, Kitui County, Kenya (Source Food Tree Project)



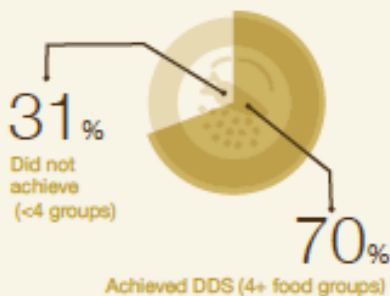
# Generating evidence: local food consumption



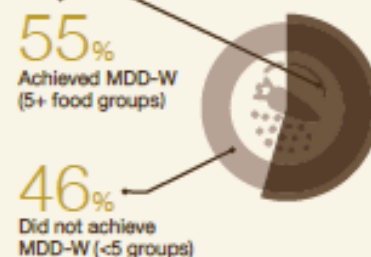
\* of WHO recommended 200/400gram for fruit/vegetable intake

## DIETARY DIVERSITY\*

### Children's Dietary Diversity\*\*



### Minimum Dietary Diversity - Women\*\*\*

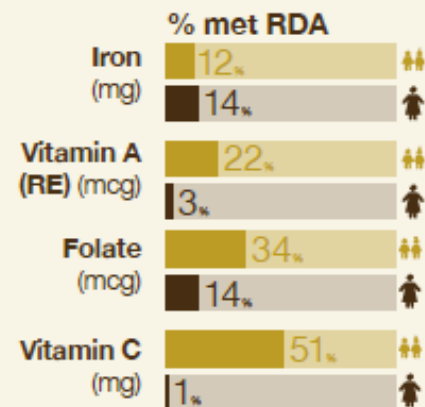


\* Dietary diversity assessed at individual level is a proxy indicator of diet quality. It assesses the variety food groups consumed in a specific time period. Higher scores indicate better diet quality.

\*\* For children >2years 7 food groups were used, for children ≥2years 9 food groups DDS was used.

\*\*\* At least 5 food groups out of 10.

## MICRONUTRIENT INTAKE



✖ Children ✖ Women

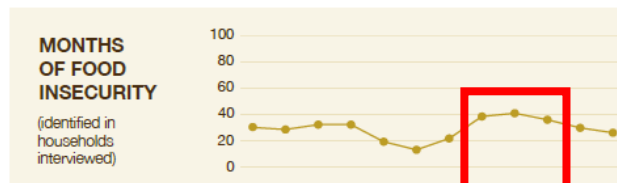
RDA: Recommended Daily Allowance



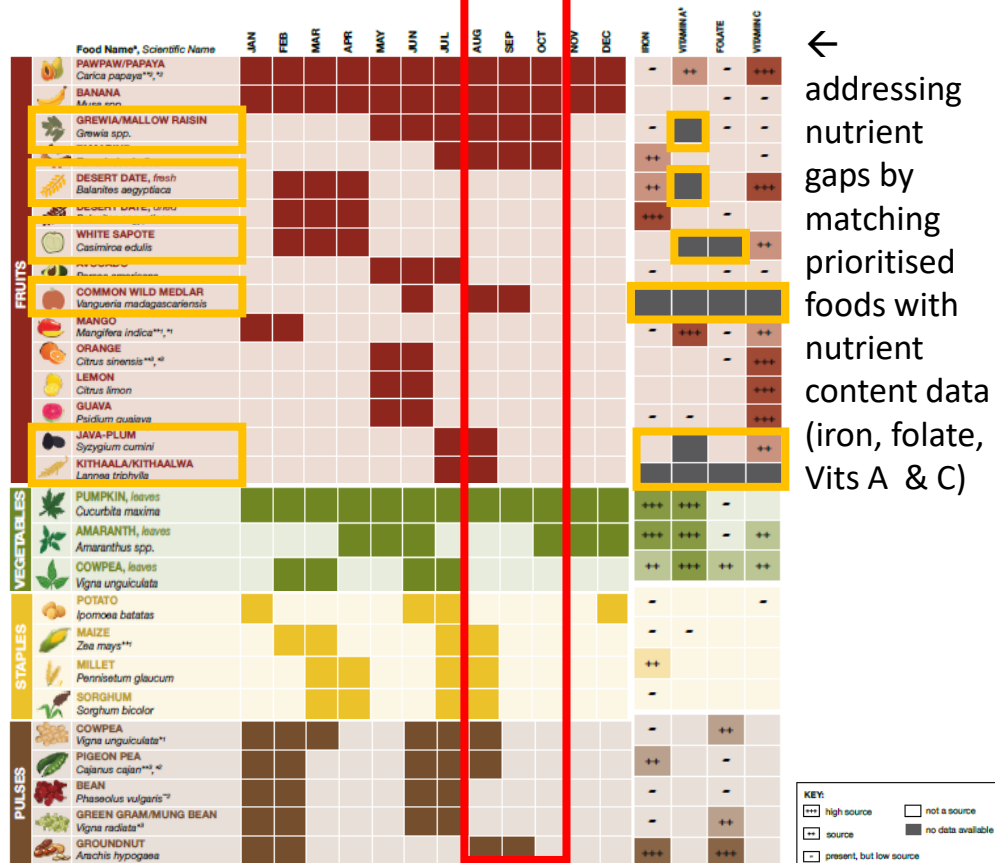
# The *Portfolio* Approach – Customising recommendations



17 location-specific food tree and crop portfolios in East Africa developed →



← food harvest mapped against months of food insecurity



<http://www.worldagroforestry.org/project/foodtrees/publications>



# Nutritional value of indigenous & underutilised food tree and crop species

## Database to support decisions

ICRAF priority food tree and crop composition database [About](#) [Citation](#) [Downloads](#)

Show  entries Search:

Food Item No.	Food name	Food preparation	Scientific Name	Protein (g)	Iron (mg)	Vitamin A (mcg)	Folate (mcg)	Vitamin C (mg)
V0002	Drumstick, pods, raw	fresh raw food	<i>Moringa oleifera</i>	No value	~		~	++
F0053	Custard apple, raw	fresh raw food	<i>Annona reticulata</i>	No value	~			++
F0051	Jujube pulp, raw	fresh raw food	<i>Ziziphus mauritania</i>	No value	~			++
F0050	Wild plum, raw	fresh raw food	<i>Ximenia americana</i>	No value	~			~
F0049	Black plum, pulp, raw	fresh raw food	<i>Vitex doniana</i>	No value	~			~
F0048	Wild medlar, pulp, raw	fresh raw food	<i>Vangueria infausta</i>	No value	~			~
F0047	Tamarind, pulp, ripe, raw	fresh raw food	<i>Tamarindus indica</i>	No value	++			~
F0046	Water berry, raw	fresh raw food	<i>Syzygium guineense</i>	No value	~			~
F0044	Monkey-orange, pulp, raw	fresh raw food	<i>Strychnos spinosa</i>	No value	~			~
F0043	Soriendeia, raw	fresh raw food	<i>Soriendeia madagascariensis</i>	No value	~			~

Showing 1 to 10 of 50 entries

Previous 1 2 3 4 5 N

Legend

high source	source	present, but low	no sources	no data available
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Food	Vitamin C (mg/100 g EP)	Vitamin A* (RE) (mcg/100 g EP)	Iron (mg/100 g EP)	Folate (mcg/100g EP)
Oranges, raw ( <i>Citrus sinensis</i> )	53	22	0.1	30
Baobab, fruit pulp, raw ( <i>Adansonia digitata</i> )	273		2.7	
Marula, fruit, raw ( <i>Sclerocarya birrea</i> )	167		3.4	
Amaranth leaves, raw ( <i>Amaranthus gangeticus</i> )	77	652	6.8	64

Vitamin A retinol equivalent (RE)\*: mcg retinol + 1/6 beta-carotene + 1/12 alpha-carotene + 1/12 beta cryptoxanthin

FAO (2012) West African Food Composition Table. FAO Rome. FAO/Government of Kenya. 2018. Kenya Food Composition Tables. Nairobi, 254 pp. Nutrient composition of selected indigenous fruits from sub-Saharan Africa. Journal of the Science of food and Agriculture. Pictures © I Stock; © CIFOR

Source: Barbara Stadlmayr

- Diversity of exotic & indigenous species in database highlights the relevance of agricultural biodiversity to support nutritious diets.
- Nutrient content data important for domestication and breeding programmes, to select highly nutritious species.



# Capacity & outreach: quality planting material

## Schools & Youth



## Agroforestry Innovation Hubs



## Community tree nurseries





- The *Portfolios* are a recommendation for promoting greater diversity of food tree species and crops on farms.
- This approach, and the Database can support decision-making for selecting species for food security, nutrition & income.
- Importance of indigenous & underutilised species for their nutritional value, & resilience in current and future food systems should not be overlooked.



# Thank you

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<https://www.foreststreesagroforestry.org/news-article/priority-food-tree-and-crop-food-composition-database/>

<http://www.worldagroforestry.org/blog/2019/11/29/year-round-micronutrients-ten-species-fruit-trees-are-better-just-few>

<http://www.worldagroforestry.org/news/using-agroforestry-address-seasonal-food-and-nutrient-gaps-communities-case-study-kenya>

<http://blog.worldagroforestry.org/index.php/2015/08/04/first-fruit-tree-portfolios-established-in-kenya-in-a-novel-approach-to-improve-year-round-nutrition/>

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Science for a food-secure future