

Linking agroforestry to nutrition: the role of food composition

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RESEARCH PROGRAM ON
Forests, Trees and
Agroforestry



Background and objective

Food composition data are important to

- assess and improve diet quality

- diversify production and improve domestication programs by selecting nutritious species

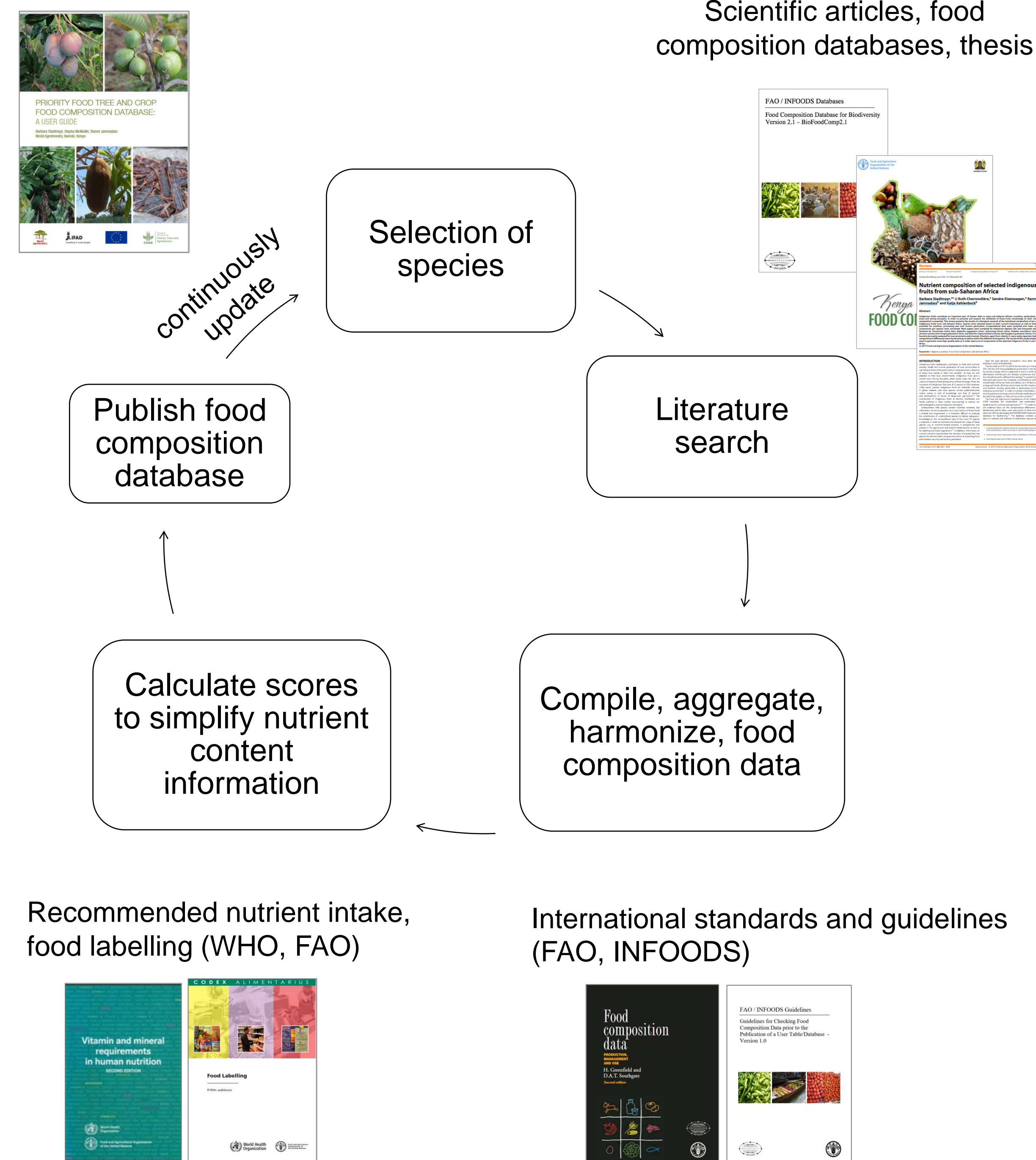
Objectives

- highlight the nutritional composition of tree foods with focus on indigenous/underutilized species
- link seasonal harvest calendars with food composition data to provide year-round micronutrient supply

Food trees

- Provide nutritious edible foods: fruits, vegetables, seeds, nuts, edible oils
- Potential to complement and diversify staple-based diets, thereby improving diet quality and health

Methods



Results Priority Food Tree and Crop Food Composition Database

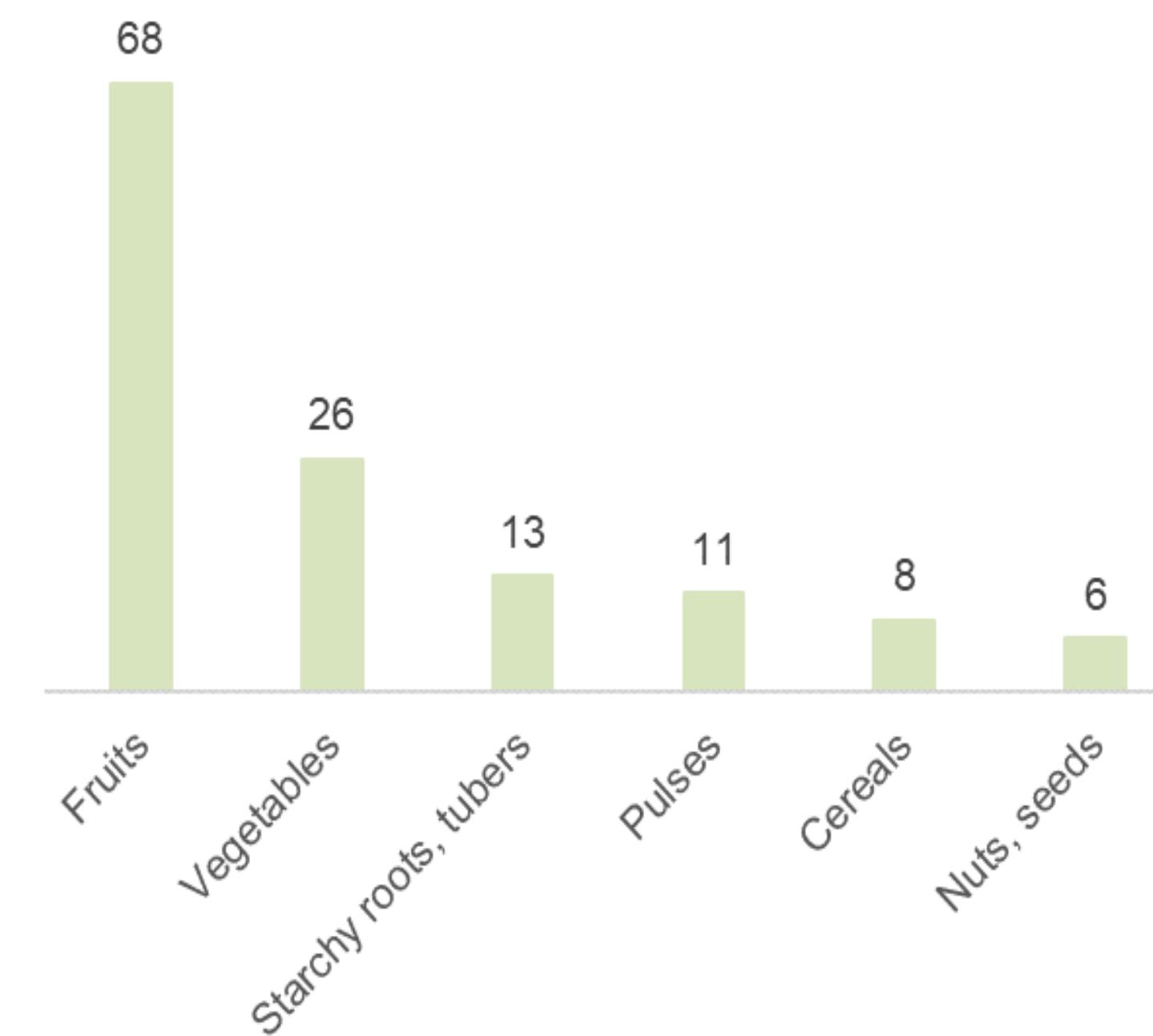


Figure 1: Number of food items per food group

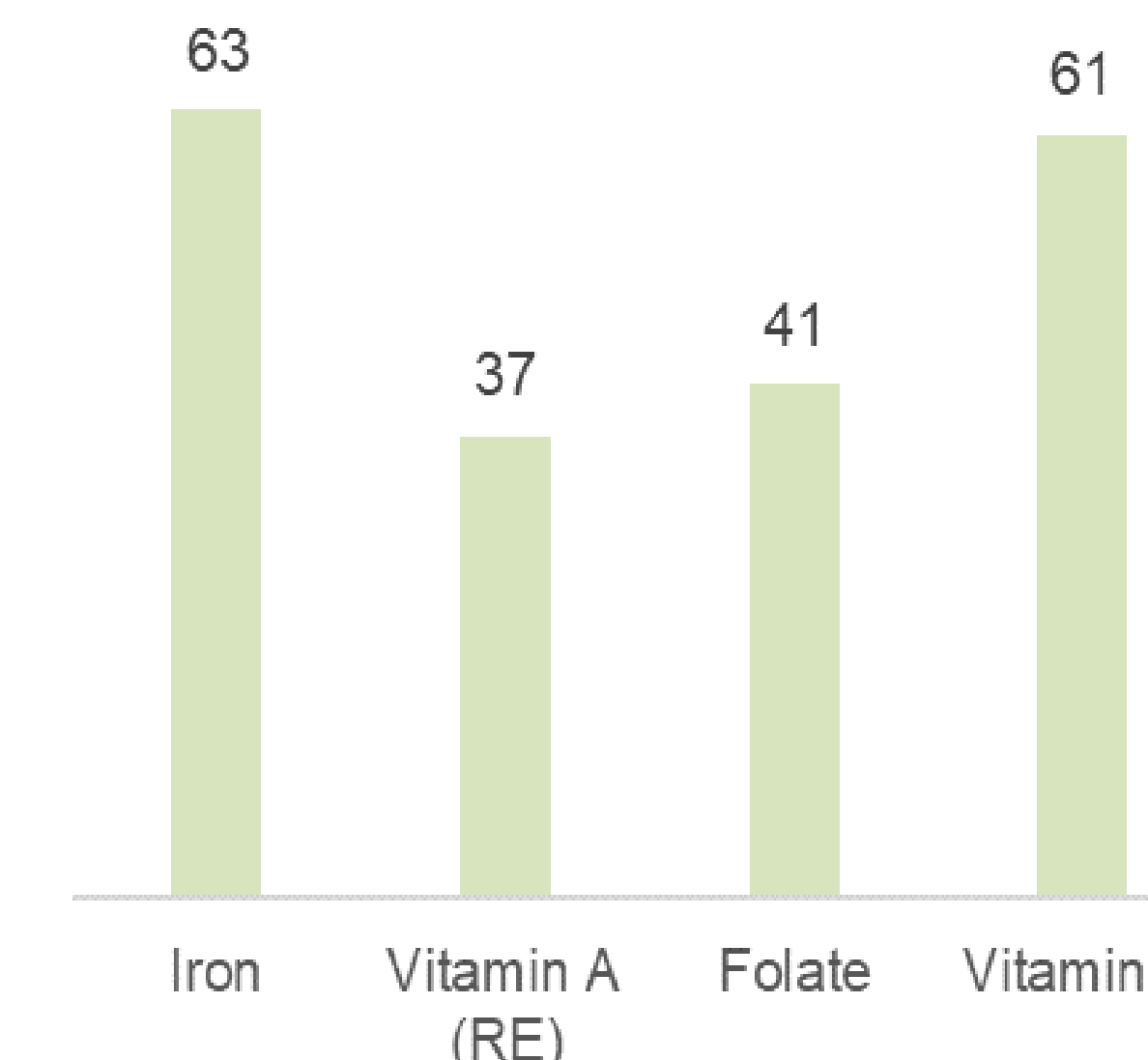


Figure 2: Data availability (%) of selected key micronutrients for fruits

Food code	F0047						
Food group	Fruits						
Food name in English	Tamarind, pulp, ripe, raw						
Scientific name	Tamarindus indica						
BibliolD	(LR_254, LR_256, LR_257, LR_259, LR_259, LR_260, WA2012(05_021), SR28(9322))						
Components	TAGNAME	Unit	Value per 100 g EP*	min	max	SD	n
Proximates							
Edible portion coefficient	EDIBLE		0.47	--	--	--	--
Energy	ENERC	kJ	1 170	--	--	--	--
Energy	ENERC	kcal	277	--	--	--	--
Water	WATER	g	26.9	21.9	41.3	5.3	11
Protein	PROTCNT	g	3.6	--	--	--	--
Fat	FAT -	g	0.8	0.4	1.2	0.4	4
Carbohydrate available, calculated by difference	CHOAVLDF	g	61.3	--	--	--	--
Fibre, total dietary	FIBTG	g	5.1	--	--	--	1
Fibre crude	FIBC	g	--	--	--	--	--
Ash	ASH	g	2.3	2.3	2.5	0.1	4
Minerals							
Calcium	CA	mg	192	166	217	--	2
Iron	FE	mg	3.1	2.1	5.0	1.6	3

Figure 3: Online database, example: Tamarind fruit, pulp.



Baobab (*Adansonia digitata*)
Edible parts: Fruit pulp, leaves, seeds
Fruit: up to 5 times more vitamin C than oranges (269mg/100 g)



Cashew (*Anacardium occidentale*)
Edible part: Cashew apple, cashew nut
Cashew nut is a high source of iron, Cashew apple is a high source of vitamin C

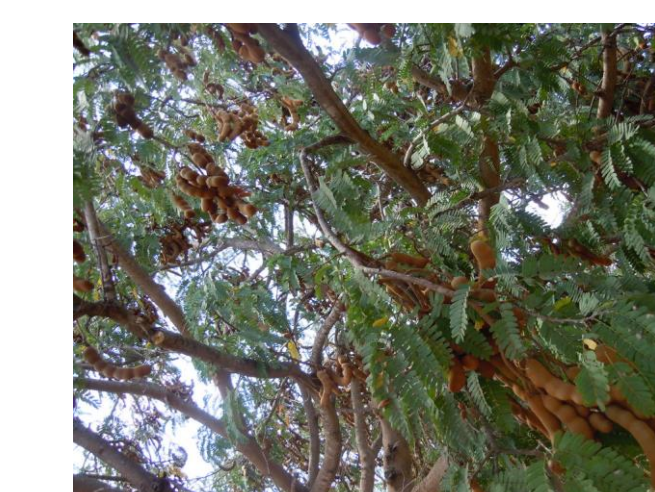
- 132 tree foods and crops (99 species)
- geographical focus sub-Saharan Africa
- 32 components: Proximates, Vitamins, Minerals
- Online database and Excel file (free download)
- Component values presented per 100 g edible portion on fresh weight basis (EP)
- Scores to simplify content information and link to Tree Food Portfolios

Link: Priority Food Tree and Crop Food Composition Database
<http://apps.worldagroforestry.org/products/nutrition/>

Food name in English	Scientific name	Iron	Vitamin A*	Folate	Vitamin C
Baobab fruit, pulp, raw	<i>Adansonia digitata</i>	+++	~	~	+++
Cashew apple, raw	<i>Anacardium occidentale</i>	~	~	~	+++
Guava, pulp, raw	<i>Psidium guajava</i>	~	~	~	+++
Cherimoya, pulp, raw	<i>Annona cherimola</i>	~	~	~	++
Sour sop, fruit pulp, raw	<i>Annona muricata</i>	~	~	~	++
African custard apple/wild	<i>Annona senegalensis</i>	~	~	~	~

Figure 4: Example of Scores

+++	high source
++	source
~	present, but low source
	not a source
	no data available



Tamarind fruit (*Tamarindus indica*)



Waterberry (*Syzygium guineense*)

Conclusion and future work

- Tree foods are good sources of micronutrients
- Challenge: availability and quality of data on nutrient content for indigenous species, in particular
- Regularly update and extend the database for new species, and additional information per country, region, cultivar, processing state.
- Link with other databases, vegetation map for Africa: <https://vegetationmap4africa.org/>,