

Does agroforestry affect human health and nutrition?

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1. Context

Agroforestry = combining trees and shrubs with agricultural crops and/or livestock on the same land management unit

- Woody plants of agroforestry systems provide many benefits for planetary health, including carbon sequestration, soil fertility improvement and the provision of nutritious food and non-food products
- Impact of agroforestry on human health and nutrition is less often examined or included as an explicit objective in agroforestry programs
- Aim: Systematically review the evidence of **direct impacts of woody elements in agroforestry on human health and nutrition** (Figure 1)

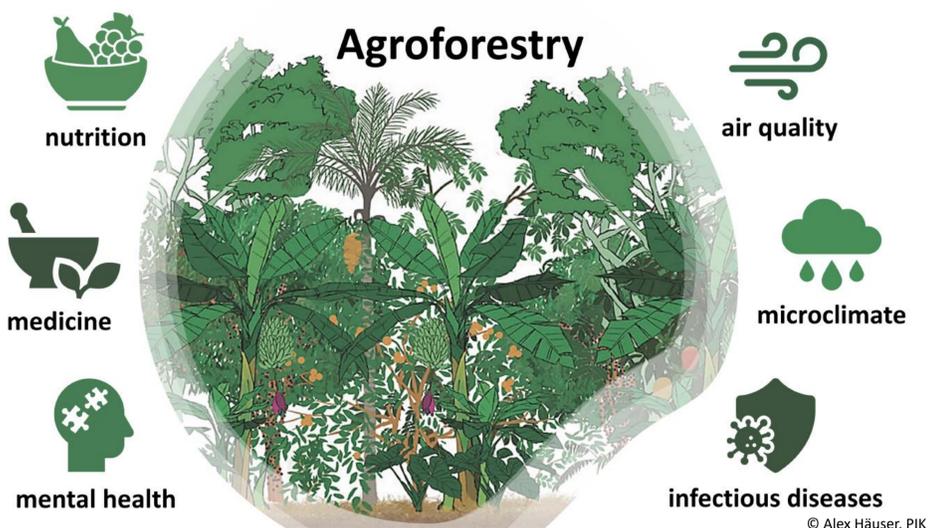


Figure 1: Direct impacts of woody plants in agroforestry systems on human health and nutrition

2. Methods

- Peer-reviewed journal articles search in four bibliographic databases: AGRIS, PubMed, Web of Science and Scopus (from their inception until Jan. 2023)
- Keywords: Combinations of agroforestry, farm, tree, shrub, health, nutrition...
- Included: All study designs, all languages and all geographical regions
- Titles and abstracts: Screened independently by two reviewers
- Full-text papers: Obtained and screened for inclusion criteria (Figure 2)

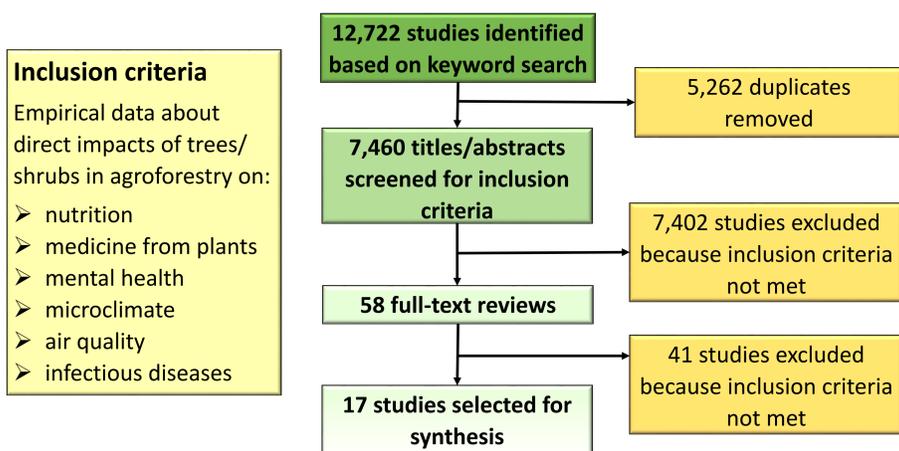
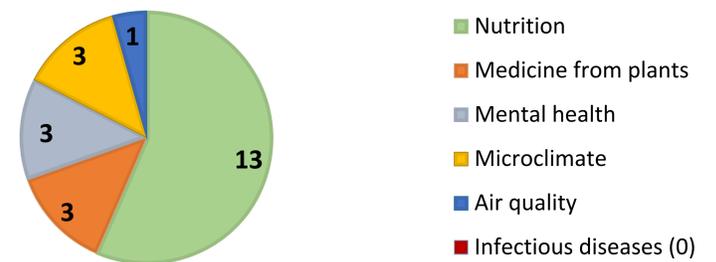


Figure 2: Flow chart diagram of the systematic literature review

3. Results

- Many studies excluded from the review, reasons for example:
 - No human-related empirical data on the selected direct impacts
 - Focus exclusively on crops (not woody plants) within studied agroforests
 - No clear differentiation between food/non-food products from woody plants sourced from agroforests or from forests
- Few studies on the links between agroforestry and different health aspects, in particular for infectious diseases (0) and air quality (1) (Figure 3)
- Most evidence in included literature on direct impacts on human nutrition, selected as focus of this poster (Table 1)



(Total: 17 studies)

Figure 3: Number of included studies for selected direct impacts (includes multiple impacts)

Author	Country	Agroforestry practice	Key findings	Study design	Sample size and population
Singh et al. (2015)	India	Homegarden (crops and woody plants)	<ul style="list-style-type: none"> • Mean production fruit per year: 1050 kg from fruit orchards with a mean size of 0.04 ha • Average home consumption of produced fruit: 34% 	Pre-post	16 farmer families
García-Flores et al. (2016)	Mexico	Family vegetable garden (crops and woody plants)	<ul style="list-style-type: none"> • 98% of families perceive that family vegetable gardens contribute foods • Most of the products are self-consumed: 77% • Frequently grown: avocado, lime, loquat and peach 	Observational; cross-sectional	180 vegetable garden owners
Kirikoshi (2017)	Niger	Multipurpose trees on farmland	<ul style="list-style-type: none"> • Women collect 5-35 kg green edible leaves in 2011 • Tree leaves are recognized as famine food, collected on farmland owned by other households in dry season 	Observational; cross-sectional	9 farm households and 10 women from within or outside the village
Kumssa et al. (2017)	South Ethiopia & Kenya	Moringa trees cultivated with staple food crops	<ul style="list-style-type: none"> • >90% of the moringa-growing household heads use moringa leaves in their diet on a daily basis • Quantity of leaves consumed per day is measured in bunches 	Observational; cross-sectional	24 household heads in Ethiopia, 56 in Kenya
Lourme-Ruiz et al. (2019)	Burkina Faso	Farms with crops, agroforestry trees and livestock	<ul style="list-style-type: none"> • Women's dietary diversity is positively and strongly correlated with the presence of food-providing agroforestry tree species in family plots 	Observational; longitudinal	580 farms (interviews with male farm heads and women of farm)

Table 1: Five example studies which assess direct impacts of agroforestry practices on nutrition

4. Discussion and Conclusion

- Very few studies examine the link between agroforestry and human health or nutrition because:
 - Source of consumed fruit not specified (e.g., forest, agroforest, market)
 - Reported dietary intake data often not comprehensive: (e.g., no quantitative food intake data)
- Few studies correlate woody plant species with dietary diversity/nutritional intake
- Almost no data found about the nutritional content of the food consumed or the nutritional status of the participants

➔ More specific, well designed **studies needed** to measure **direct impacts** of woody plants in agroforestry systems on human health and nutrition