

# ‘NuTree’: Integration von Ernährungs- und Gesundheitsaspekten in Agroforstprojekte der Entwicklungszusammenarbeit in Subsahara-Afrika: eine Machbarkeitsanalyse

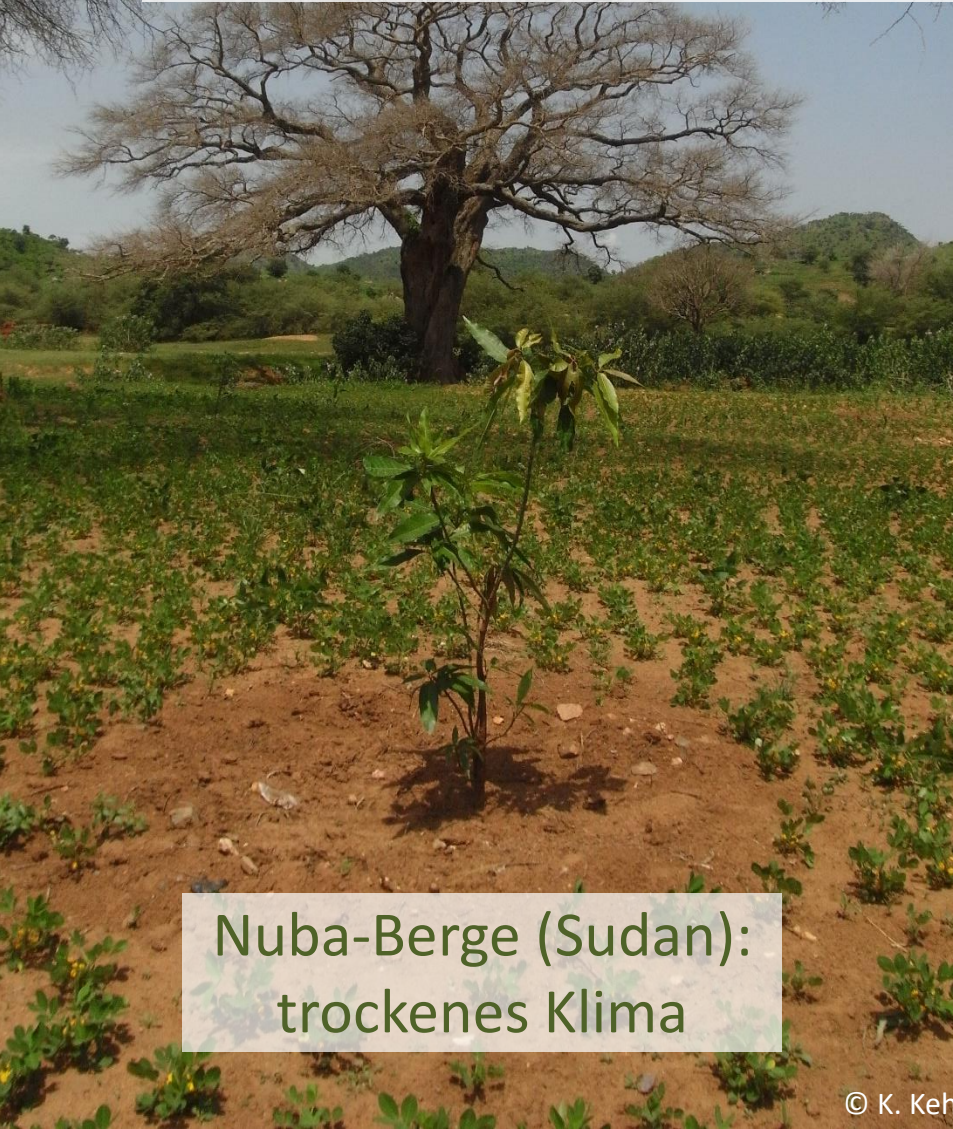
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**Agroforst** = Kombination von Gehölzen (Bäume, Sträucher) mit Ackerkulturen und/oder Tierhaltung auf einer Fläche (räumlich oder zeitlich)



Nuba-Berge (Sudan):  
trockenes Klima

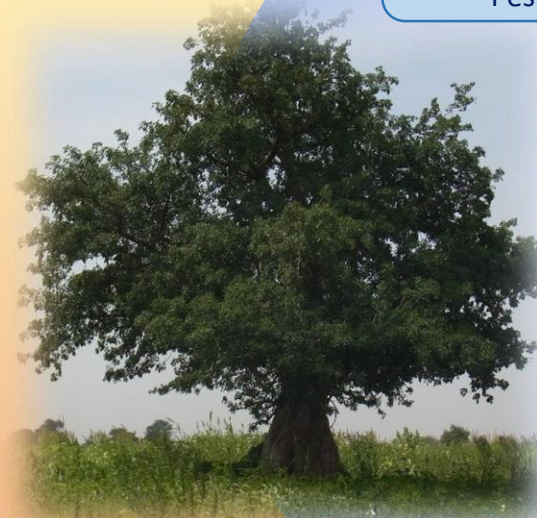


West-Kenia:  
feuchtes Klima

# Leistungen von Bäumen in Agroforstsystemen für 'Planetary Health'

Mensch

Umwelt



Sauberes Wasser  
(z.B. weniger Nitrat,  
Pestizide)

CO<sub>2</sub>-Bindung

global

Klima-  
stabilisierung

lokal

Verbesserte Boden-  
fruchtbarkeit

Saubere  
Luft

Schatten für  
Menschen, Tiere,  
Nutzpflanzen

Erosions-  
schutz

abiotisch

biotisch

Habitate  
(z.B. für Bestäuber,  
Nützlinge)

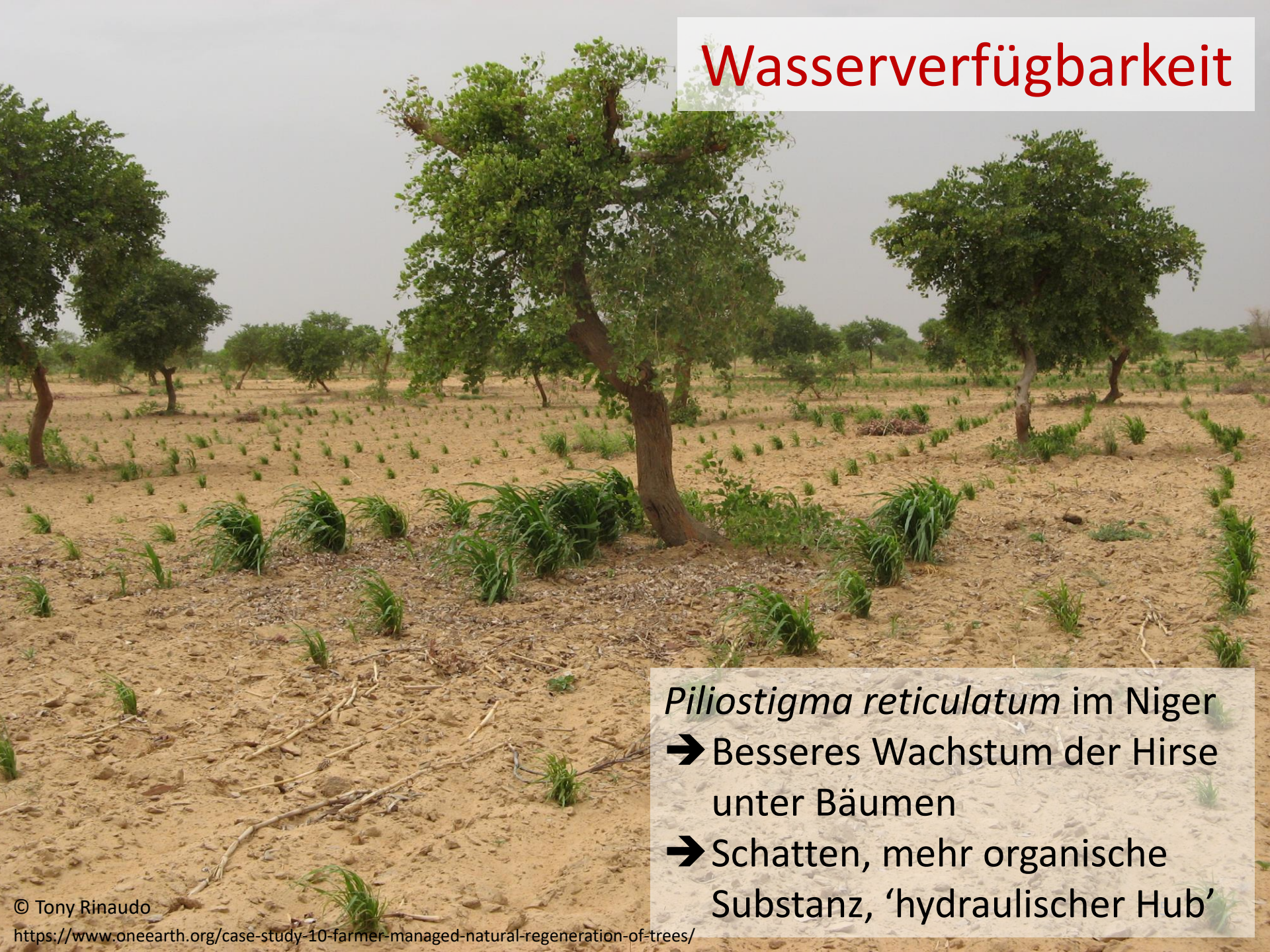
Erhalt der  
Biodiversität

Schutz verbliebener  
Naturwälder

# Verbessertes Mikroklima

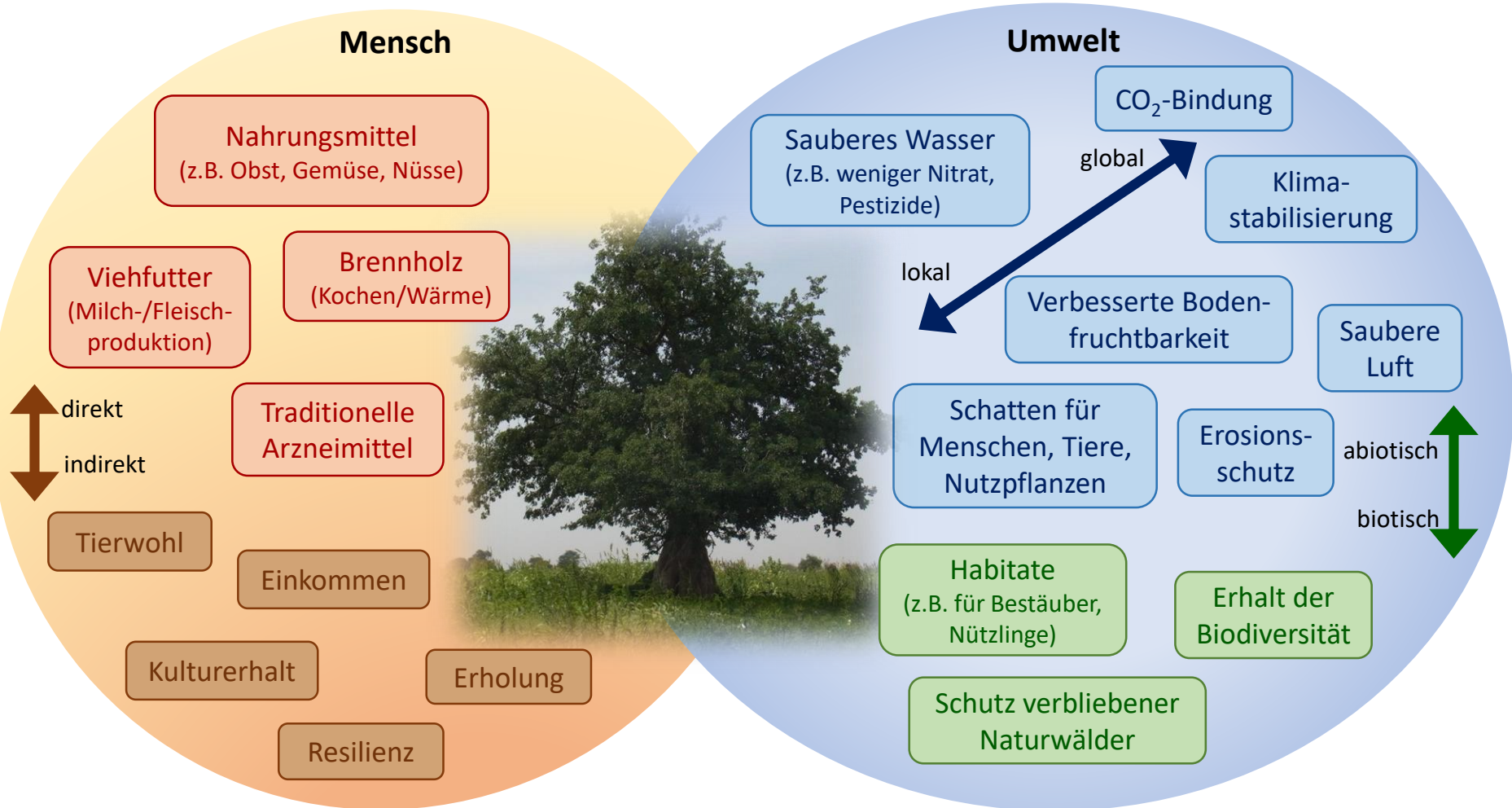
Anbau von Gemüse und  
Kräutern im Schatten eines  
Baobabs, Nuba-Berge, Sudan

# Wasserverfügbarkeit



*Piliostigma reticulatum* im Niger  
→ Besseres Wachstum der Hirse  
unter Bäumen  
→ Schatten, mehr organische  
Substanz, 'hydraulischer Hub'

# Leistungen von Bäumen in Agroforstsystemen für 'Planetary Health'



# Grundnahrungsmittel

**Mais unter *Faidherbia* Bäumen**

➔ Höhere Maiserträge

➔ Verbesserte Bodenqualität

Maize farming in a *Faidherbia* agroforest in Mbarali District, Southern Highlands, Tanzania. 2008

Photo: Saldi Mkomwa

# Obst und Gemüse



Obstbäume (Mango, Papaya, Orange)  
in einem Feld mit Kürbissen und  
Bohnen, Machakos County, Kenia



Resilienz: geringeres  
Risiko eines totalen  
Ernteausfalles

→ Gute Mango-  
Erträge bei totalem  
Ausfall der  
Maisernte durch  
Dürre in Ost-Kenia

# Brennholz

*Combretum glutinosum* in einem  
Hirsefeld, Niger

- ➔ Bäume zur Brennholzgewinnung
- ➔ Aufwuchs aus Baumstümpfen

# NuTree-Projekt

**Zeitraumen:** April 2022-März 2024

**Ziel:** Ernährungs- und Gesundheitsaspekte von Agroforstprogrammen in Subsahara-Afrika in das Bewusstsein von Akteuren bringen

**Zielgruppen:**

- Lokale, regionale und globale Akteure aus Forschung und Praxis, Gesellschaft, Wirtschaft, Politik, ...
- Multi- und transdisziplinär: Land/Forstwirtschaft, Umwelt, Gesundheit, Ernährung, Ökonomie, Soziales, ...
- Beispiele: GIZ, internationale Hilfsorganisationen (WHH...), Universitäten, Forschungsinstitute (ICRAF...), lokale/regionale NGOs, Ministerien, Geldgeber, bäuerliche Vereinigungen/Genossenschaften, Umweltgruppen...

# NuTree Forschungsfragen

1. In wieweit spielen Ernährungs-/Gesundheitsaspekte in vergangenen + laufenden Agroforstprojekten eine Rolle?
2. Was braucht es, um diese Aspekte besser in zukünftige Agroforstprojekte zu integrieren?
3. Wie können die Implementierer dieser Agroforstprogramme die Wirkung ihrer Aktivitäten auf Ernährung und Gesundheit evaluieren?
  - Konzepte, Projektdesign, Methoden zur Erfassung und zum Monitoring...



# NuTree-Projekt: Produkte

1. Übersicht über Einbindung von Ernährungs- und Gesundheitsaspekten in vergangenen/laufenden Agroforstprogrammen (review paper)

## Erste Ergebnisse:

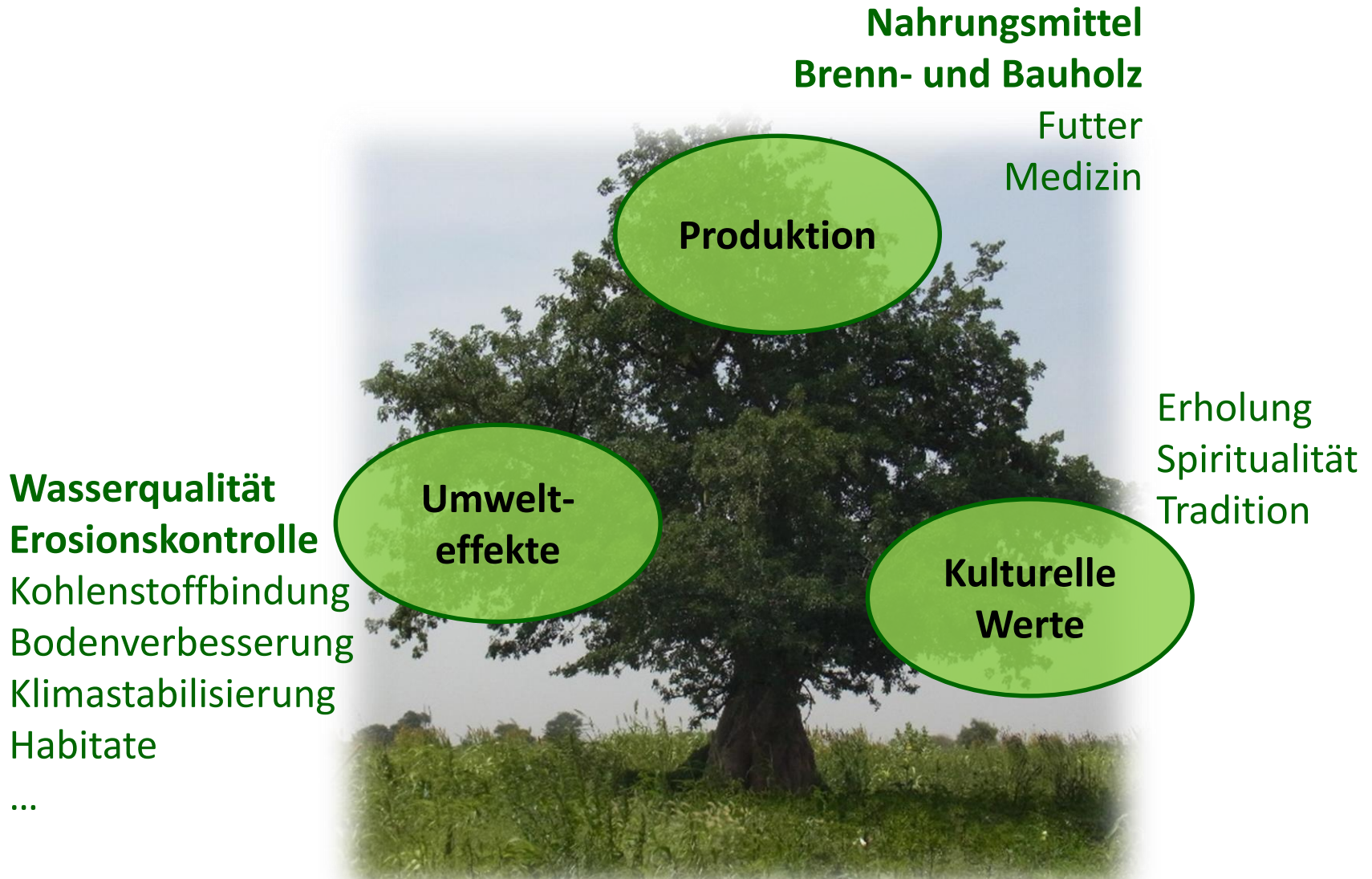
- Wenige wissenschaftliche Publikationen basieren auf quantitativen Daten, oft nur **qualitative Methoden** oder generelle Aussagen
- Mehr Publikationen zu **indirekten Effekten** der Bäume, z.B. Ertragssteigerungen bei Getreide, Futterproduktion, Bodenfruchtbarkeit oder Einkommensschaffung
- Wenig zu **direkten Effekten** wie verbesserte Ernährung oder Produktion von Arzneimitteln

# NuTree-Projekt: Produkte

1. Übersicht über Einbindung von Ernährungs- und Gesundheitsaspekten in vergangenen/laufenden Agroforstprogrammen (review paper)
2. Berichte über zwei Praxis-Workshops mit relevanten Interessengruppen (Programmträger, lokale/regionale Akteure) → Beiträge aktueller Agroforstprogramme zu Ernährung + Gesundheit; Ideen/Innovationen zu Verbesserungen und deren Erfassung; Netzwerke...
3. Konzeptioneller Rahmen und Fahrplan für bessere Integration und Evaluierung von Ernährungs- und Gesundheitsaspekten in zukünftige Agroforstprogramme

→ **Win-win-Situation:** bessere Nutzung von Agroforstprogrammen für Planetary & Human Health

# Agroforst und der Water-Energy-Food-Nexus



# Vielen Dank für Ihre Aufmerksamkeit!

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***Table 1 Direct impacts in paper that have been analysed so far (18)***

Number of references	Nutrition	Medicine from plants	Mental health	Microclimate	Air quality	Infectious diseases
With reference	12	6	2	5		4
Without reference	2	2	3	3	1	1

***Table 2 Indirect impacts in paper that have been analysed so far (18)***

Number of references	Crop yields	Fodder for livestock	Fuel wood supply	Income	Recreation	Resilience	Environmental conditions
With reference	12	10	10	12	3	12	13
Without reference	4	3	6	4		3	4

# NuTree activities and outputs

1. Review and synthesize existing evidence of the links between agroforestry and nutrition/health in past and ongoing projects (including scientific and grey literature, interviews) → output: MSc thesis/review paper
2. Network and bring together key stakeholders in two workshops: discuss review results, collect knowledge, identify barriers regarding nutrition/health within agroforestry projects → output: workshop reports
3. Combine outputs from 1. and 2. in a participatory way to develop (and disseminate) a conceptual framework and roadmap to guide incorporation (and evaluation) of health/nutrition aspects in future agroforestry projects → output: two documents

# Trees for food and nutrition security

- Fruits provide an easily available source of **micronutrients**
- High potential for **income** generation from sales of fresh and processed fruits, particularly for women
- Fruit trees more tolerant against droughts than annual crops  
→ food security, resilience, **climate change adaptation**
- Harvest of different fruits possible **year-round** due to high species diversity → filling the 'hunger gap' before harvest of staples



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# Direct and indirect benefits from trees

Food  
Fodder  
Fuelwood & Timber  
Medicine

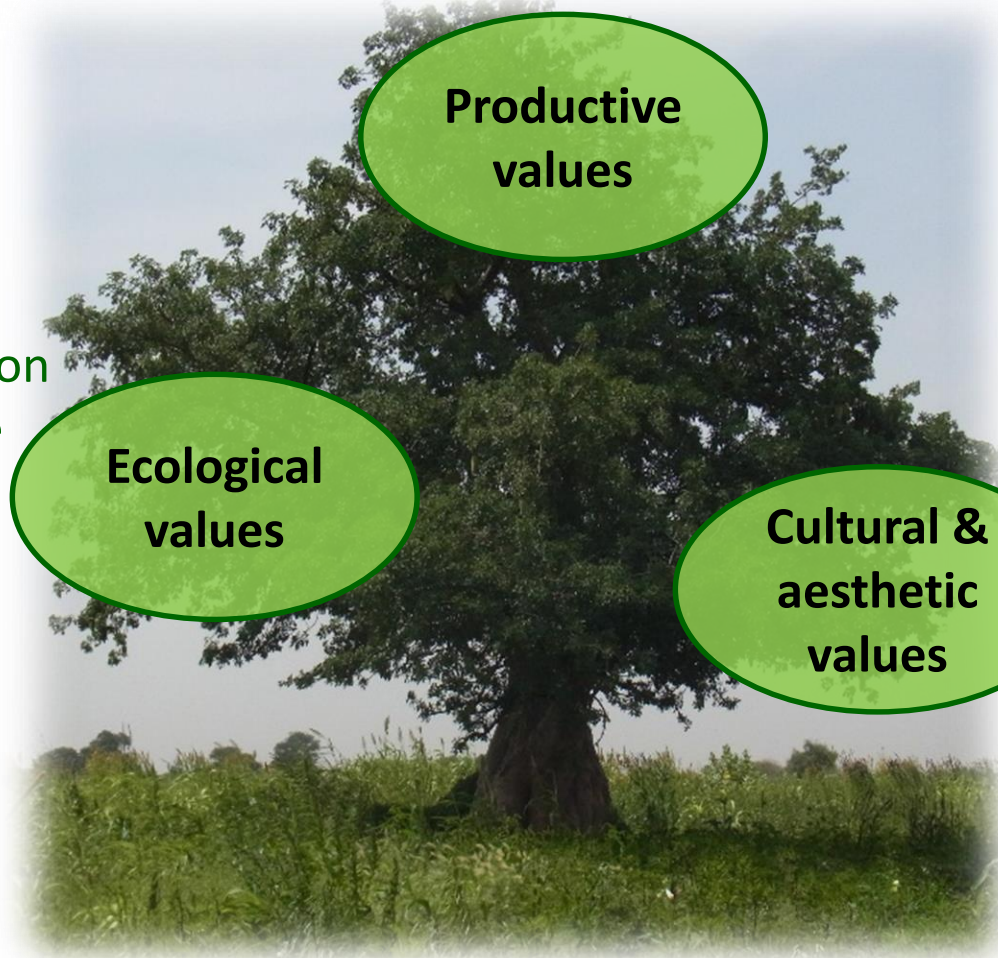
**Productive values**

Carbon sequestration  
Soil & microclimate improvement  
Water protection  
Habitat provision

**Ecological values**

Recreation  
Religion  
Tradition

**Cultural & aesthetic values**



# Food trees in urban gardens in Bamako:



Tamarind (fruit + vegetable)



Mango (fruit)



Moringa (vegetable)

© K. Kehlenbeck



Baobab (vegetable)

# AGROFORESTRY'S IMPACT

## ON THE ENVIRONMENT & HUMAN HEALTH IN SUB-SAHARAN AFRICA

Agroforestry systems mimic nature by intentionally combining trees, woody shrubs, crops and/or livestock on landscapes, in varied spatial and temporal sequences. Agroforestry trees alter microclimates, water cycles, soil health and biodiversity, with cascading effects on human health outcomes such as food security, diseases, and migration. Impacts are most often positive and negative.



### FOOD & NUTRITION SECURITY

Roughly 237 million people in Sub-Saharan Africa are food-insecure and around 20% of the population on the continent suffers from malnutrition. Agroforestry has potential to help increase food production, via increased crop production and availability of micronutrient-rich fruits, leafy vegetables, and nuts, but also indirectly, via provision of protein-rich diets for livestock. Tree diversity can address food seasonality and ensure food stability through the year, while increased income from the selling of tree products can be a mechanism for improved household access to more diversified, healthy foods.



### MIGRATION

Where agroforestry helps to mitigate environment change such as soil degradation and increase household resilience to random climate shocks (floods, droughts, etc.), reduced migration may occur. But the opposite may also happen. Modest increases in income such as that provided by agroforestry products, especially when they represent wild harvesting on communal lands as opposed to investment in the land itself, may provide the money required to migrate versus the incentive to remain in place.



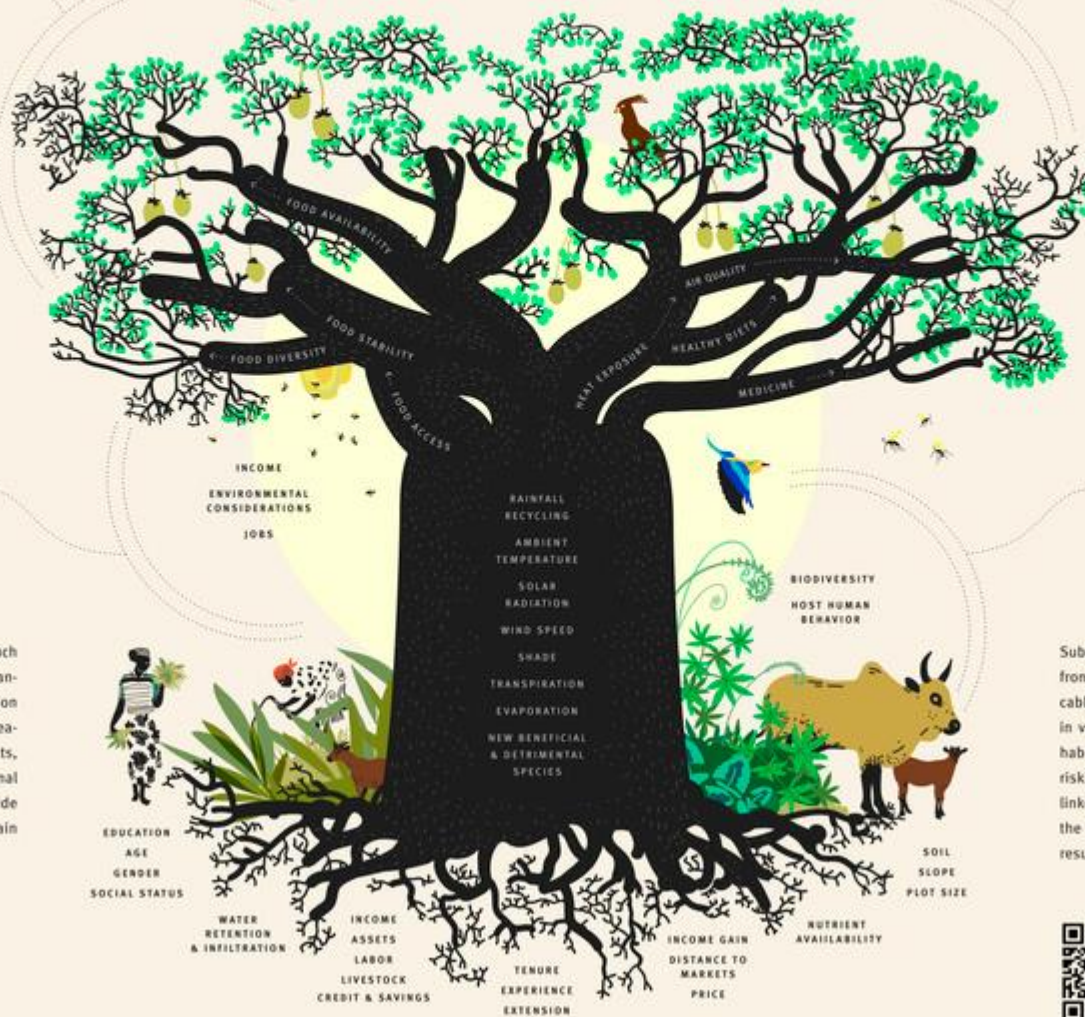
### NONCOMMUNICABLE DISEASE

The prevalence of non-communicable diseases such as cardiovascular disease, cancer, chronic respiratory diseases, hypertension, diabetes, and mental illness is increasing rapidly in Sub-Saharan Africa. Agroforestry may also help mitigate the threat posed by the rise in incidence of such diseases. Agroforestry provides fruits, nuts and leaves that can contribute to healthy diets, reduces heat stress and ensures farm workers by providing shade, mitigates air pollution especially the movement of dust, and is a principle source of medicines from tree fruits, and bark.



### INFECTIOUS DISEASE

Sub-Saharan Africa is the only region globally where the risk from infectious disease still exceeds those from non-communicable diseases. Agroforestry alters risks of infectious diseases in various ways. Tree-induced changes to microclimate and habitats change host, pathogen and vector prevalence and risks of transmission to humans. Such changes have also been linked to the spread of diseases such as Marburg and Ebola in the region. However, changes in populations do not always result in increased transmission (e.g., for malaria in Africa).



Based on: Rosenstock et al. «A Planetary Health Perspective on Agroforestry in Sub-Saharan Africa» (2019). *One Earth*, 10.1016/j.oneear.2019.10.017

Illustrations by: Sandra Riedel, ried.uno



# AGROFORESTRY

Food for helping people out of hunger and poverty

**FIREWOOD AND BUILDING MATERIAL**  
Trees provide firewood, timber and potential income >

**FOOD AND MEDICINE**  
Trees provide food, fruits and medicines >

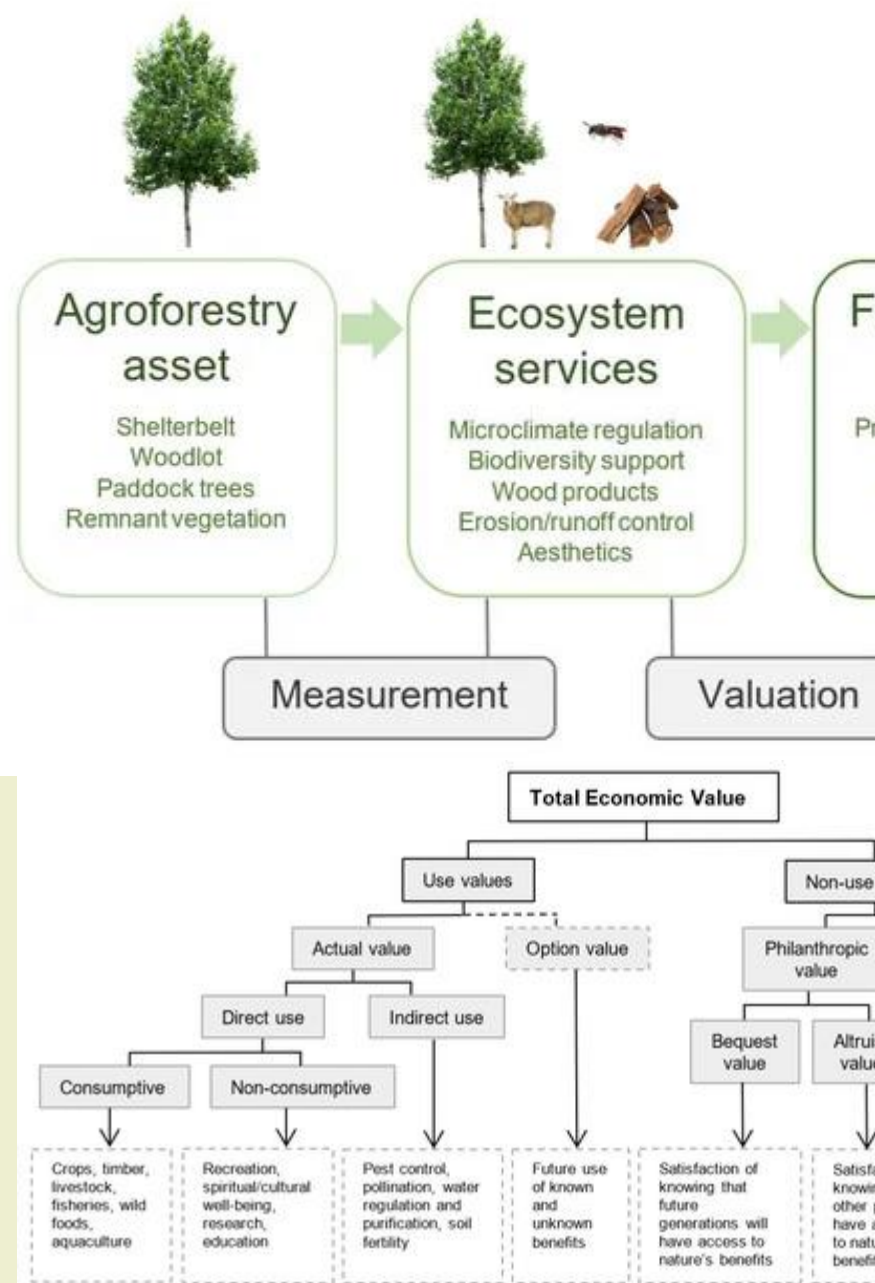
**SHADE**  
Trees provide shade for other plants, livestock and human beings >

**NITROGEN FIXING**  
Trees can fix nitrogen in the soil, providing more favourable conditions for crops >

**ANIMAL FEED**  
Trees provide fodder for animals >

**PROTECTION AGAINST SOIL EROSION**  
Trees help to stabilize the ground and reduce erosion

<https://www.agroforestry.org/what-we-do/agroforestry/>



<https://www.mdpi.com/1999-4907/10/11/>