



**PLANTING THE FUTURE  
WITH MORINGA**



# THE TEAM

**Sibylle Barta** / Occupational therapist, many years of experience with Moringa and the African culture and mentality.

**Claus Barta** / Diplom Betriebswirt (FH), Moringa expert, part of a scientific network and author of books on the subject of Moringa and healthy nutrition.

**Prof. Dr. Becker** / Agricultural scientist, former head of the "Institute for Tropical Agricultural Sciences" (University of Hohenheim), one of the most cited researchers in the field of cultivation and use of Moringa.

**Dr. George Francis** / Natural scientist, breeder of Moringa seeds, EU expert, many years of experience in Moringa cultivation.

**Arne Rohlfs** / Business economist and over ten years of operational experience in the management of Moringa projects, diverse contacts with international producers and decision-makers in politics and business.

**Christof Ruhmich** / Graduate economist and development worker, high level of expertise in the Moringa value chain, cultivation and processing in growing countries.

## The goals

### Establishment of a sustainable moringa value chain

- Ecological
- Economical
- Social
- With education and research

### Training levels:

- Moringa cultivation
- Moringa sales on the local market
- Moringa sales on the international market
- Scientific activity



# WHY MORINGA?







**We cannot buy a new  
buy a new world**

**However, the cultivation of Moringa provides ideal conditions for an ethical and sustainable development process and at the same time it is an excellent means of strengthening health.**



# OUR MORINGA MISSION



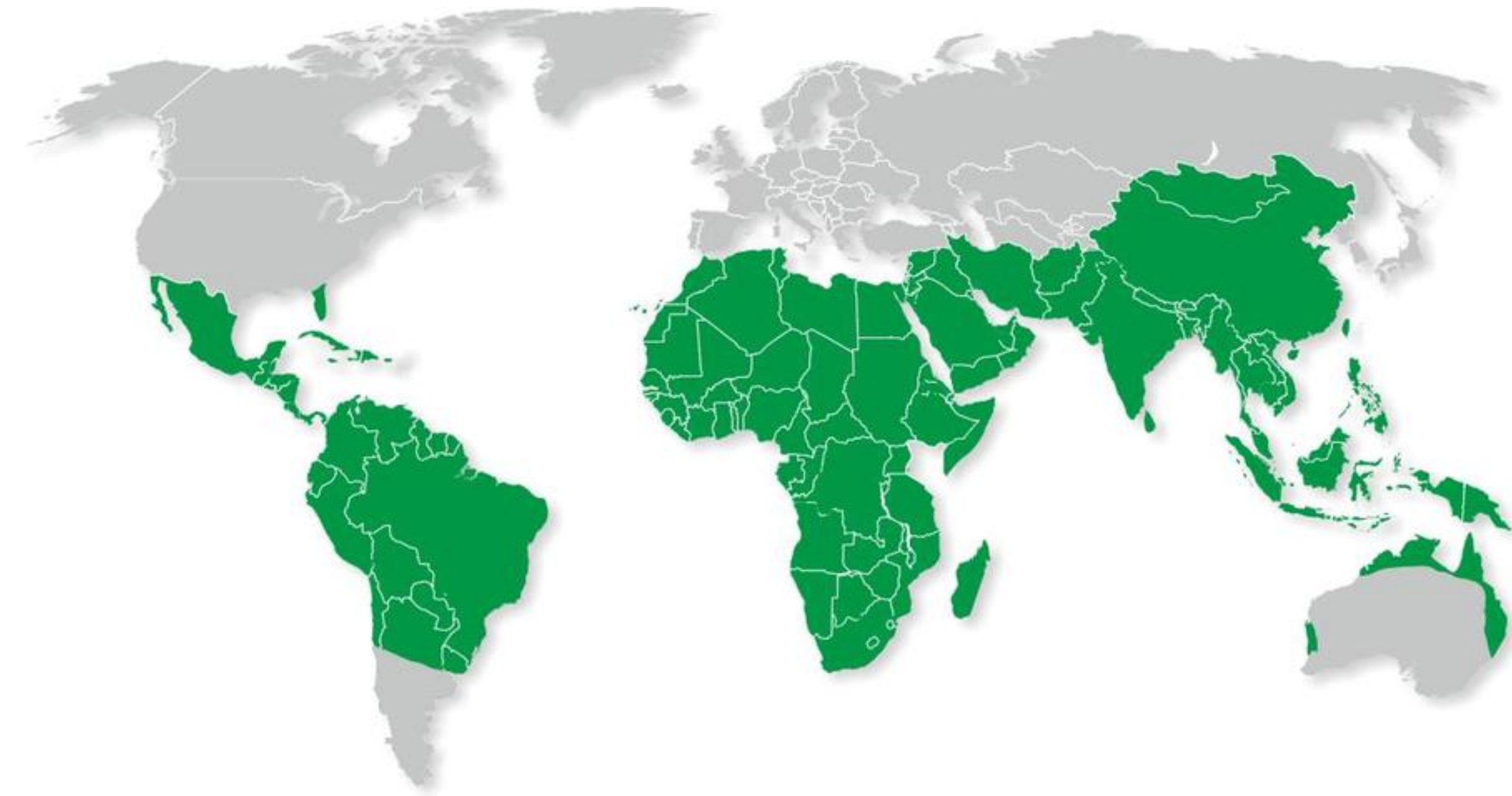
The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future.

**Moringa cultivation can make a significant contribution to achieving these goals in the shortest possible time.**

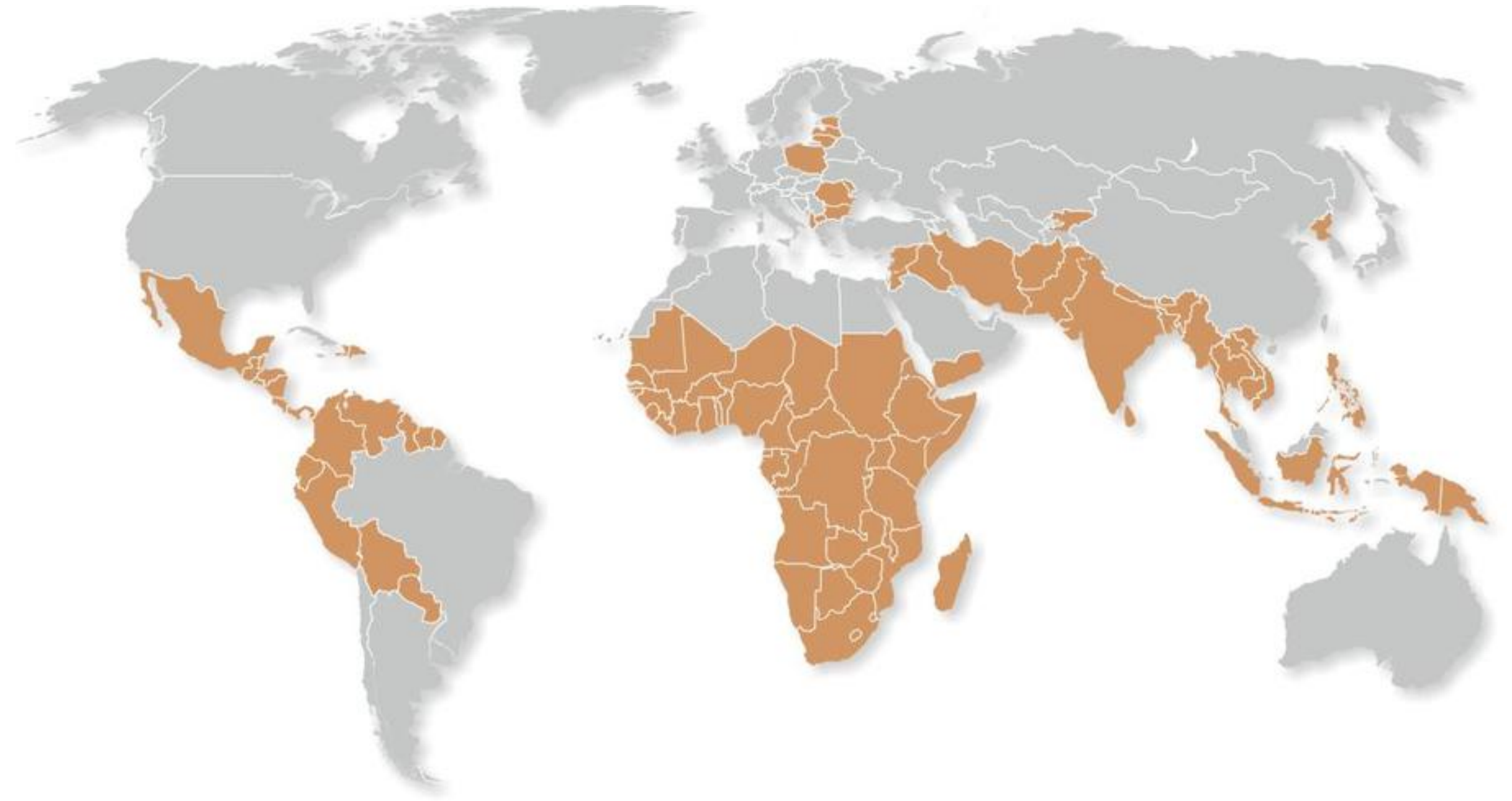


# Moringa as a central building block for the fulfilment of the SDGs

Countries where *Moringa oleifera* can be grown  
(including with projects in very barren areas)



Countries in which a share of at least 5% of the  
population suffers from hunger



*Although few Westerners have ever heard of it, moringa is potentially one of the planet's most valuable plants, at least in humanitarian terms. Throughout Africa, moringa could be immediately incorporated into programs tackling the misery of malnutrition. Arguably, this multi-tasking species is the most exciting tropical resource still awaiting widespread application. And it is a supreme poor-person's plant with promise for benefiting much of rural Africa.*

National Academies of Sciences, Lost Crops of Africa: Volume II: Vegetables. Washington, DC: The National Academies Press





# THE FAO OF THE UNITED NATIONS ABOUT MORINGA

## Special qualities

- Leaves are rich in protein, vitamins A, B and C, and minerals – highly recommended for pregnant and nursing mothers as well as young children.
- Plant produces leaves during the dry season and during times of drought, and is an excellent source of green vegetable when little other food is available.
- It is fast growing and drought tolerant (does not tolerate water-logging).
- Moringa products have antibiotic, antitrypanosomal, hypotensive, antispasmodic, antiulcer, antiinflammatory, hypo-cholesterolemic, and hypoglycemic properties.

## Importance for smallscale farmers

- Source of maternal and child nutrition, medicine and household income Trees provide wind breaks and reduces soil erosion.



Source: The Food and Agriculture Organization of the United Nations, <https://www.fao.org/>



# MORINGA – MUCH MORE THAN JUST FOOD

## Cultivation and ecology of Moringa

- Tolerates a variety of soil conditions
- Is relatively resistant to disease and insects
- Is able to withstand light frost and heat up to 48 °C
- Is fire resistant even in extreme drought conditions
- Tolerates anywhere from 250 to 3000 mm precipitation per year
- Grows very quickly (1–2 metres in the first three months)
- Combating desertification and can be used for reforestation
- Needs no chemical fertilisers to grow and can be used as food, natural fertiliser, biomass and animal feed
- Binds CO<sub>2</sub> in the roots and has a low water consumption
- Increase in biodiversity through “living middle forest”



## Social

- Overcoming poverty and hunger
- Work and education instead of rural exodus
- Economic growth in the producing countries

## Economical

- High yield even on degraded land
- High demand due to the health value
- Offers good national and international market opportunities for the fruit, seed and leaf products



# WHAT IS MORINGA?

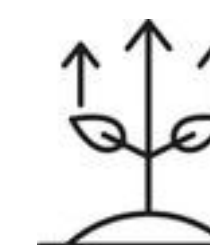




# VALUE ADDED TREE



- **Poverty reduction:** Grows in areas where it is urgently needed as a source of income and food.
- **Frugal:** Moringa also thrives on sandy and poor quality soils. Due to its deep and thickened storage roots, it has a low water requirement and can therefore withstand longer periods of heat and drought.
- **Nutritional security:** The seeds have a very high protein and fat content of 30-35% each. The leaves are the most nutritious parts of the plant in the world. Nevertheless, they can be harvested in the first year and then several times a year - a great advantage for yield and food security.
- **Climate protection:** Just one year after sowing, the tree reaches a height of three meters and absorbs a lot of CO<sub>2</sub>.





# MORINGA - THE USE OF LEAVES AS A SHRUB



- With an average **length of 1-2 cm** and a width of 0.6-1.0 cm, the leaves are relatively small.
- Once the plant cuttings have reached a **height of 1-2 m**, they can be harvested from the **cut branches several times a year**.
- In total, this produces a very high biomass of up to **10-40 tons per hectare**.



# THE POSSIBLE USES OF THE LEAVES



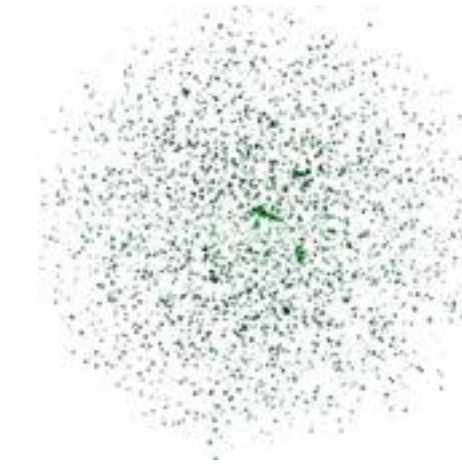
## Leaves, leaf powder

- Food to combat hunger and malnutrition
- Food supplement
- Spices
- Tea
- Fermented products



## Protein-Powder

- Food industry
- Fitness industry
- Nutritional supplements
- Pet food industry



## Ultrafine powder

- Suspension for the food industry
- Beverages
- Soups
- Body care
- Food supplement



## Extracts and essential oils

- Food industry
- Tea extract
- Spice extract
- Personal hygiene
- Cleaningsupplies
- Phytotherapy
- Plant protection products
- Plant Growth Spray



## Recycling of waste

- Production of biomass and biogas
- Biochar
- Animal feed
- Humus, green manure
- Paper

● Healthy eating

● Environment and eco-friendly products

● Personal care, cosmetics

● Phytotherapy

● Plant care and cultivation

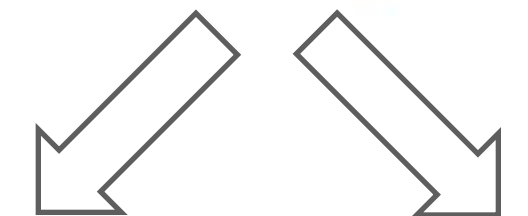
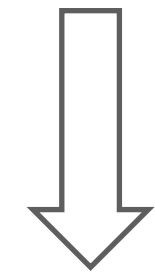
● Cleaning supplies



# MORINGA - THE USE OF FRUITS AND SEEDS



Young fruits are edible as vegetables



The ripe seeds, can be recognized by their brown color.  
Inside are the kernels.

They are particularly interesting for the food sector as they combine three advantages:

High protein content ! → Protein-containing products

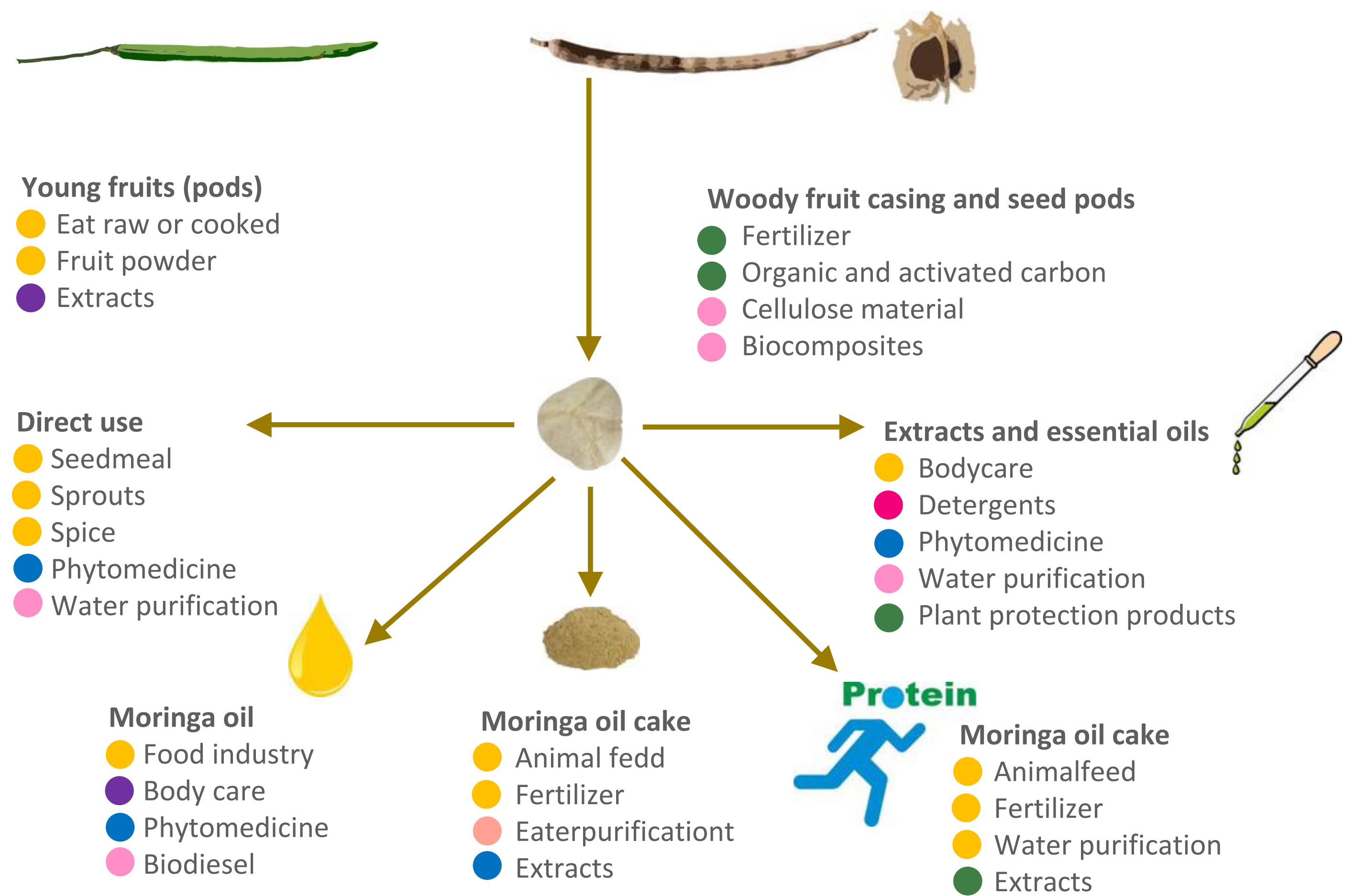
High fat content ! → Care and cooking oils

High active ingredient ! → Basis for durable and healthy products





# POSSIBLE USES OF THE FRUITS AND SEEDS



● Healthy eating	● Environment and eco-friendly products	● Personal care, cosmetics
● Phytotherapy	● Plant care and cultivation	● Cleaning supplies



# WHAT ARE THE BENEFITS OF THE MORINGA Oil?





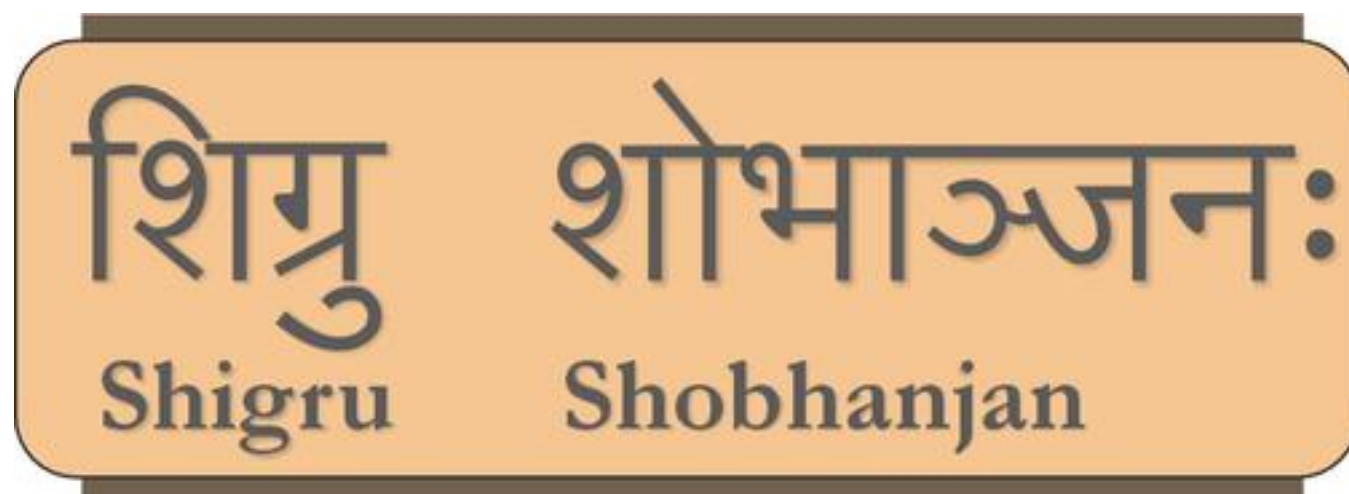
# MORINGA OIL HELPS EXTERNALLY AND INTERNALLY



The word Moringa oil (Ben oil) hieroglyphic script



The two names for Moringa in ancient Indian (Sanskrit)



## In general and as kitchen oil

- Highly valued since ancient times
- Similar fatty acid spectrum as olive oil (high omega-9 content)
- Very good omega-6 to omega-3 ratio
- Moringa oil is 4.5 times more oxidatively stable than olive oil in the Rancimat test
- Thus highest protection against spoilage and auto-oxidation (long-term storage for several years possible)
- High thermal stability (can even be heated up to around 200° C in cold-pressed form and can even be used for deep-frying)
- Moringa oil has a proven anti-inflammatory effect both externally and internally and reduces cell ageing (also protects against liver damage and neurological diseases).



# MORINGA OIL FOR THE SKIN AND SKIN DISEASES



- Wide range of different fatty acids with a skin-like lipid structure.
- Very high proportion of oxidation-stable fatty acids and vital substances (enrichment of the skin with anti-inflammatory and anti-microbial active ingredients).
- Maximum protection against spoilage and auto-oxidation (protective and nourishing effect with intact fatty acids).
- Moringa oil promotes natural lipid and moisture regulation, making the skin softer, more elastic and smoother.
- Can also be easily applied as a pure oil (simplifies application).
- Penetrates well into the deeper layers of the skin (prevents the skin pores from clogging due to "clogging").
- The good depth effect ensures that active ingredients can also penetrate into the deeper layers of the skin.
- Ideal carrier oil for fixing active ingredients and fragrances in cosmetic products.
- Binds unpleasant odor components of other cosmetic ingredients.
- **Can be used for:** Hand diseases such as neurodermatitis and psoriasis, for minor injuries, as an anti-ageing and massage oil and for daily skin care.




# WHAT ARE THE BENEFITS OF THE MORINGA LEAVES?





# MORINGA POWDER FOR VITAL SUBSTANCE OPTIMIZATION

 <b>Moringa compared to other "superfoods" (both in powder form)</b>						
Nutrient or vital substance	Moringa Matcha	Moringa Turmeric	Moringa Yam root	Moringa Baobab	Moringa Barley grass	Moringa Spirulina
Protein	↑	↑	↑	↑	↑	↑
Calcium	↑	↑	↑	↑	↑	↑
Magnesium	↑	↑	↑	↑	↑	↑
Iron	↑	↑	↑	↑	↑	↑
Phosphorus	↑	↑	↑	↑	↑	↑
Potassium	↑	↑	↑	↑	↑	↑
Copper	↑	↑	↑	↑	↑	↑
Zinc	↑	↑	↑	↑	↑	↑
Beta-Carotene	↑	↑	↑	↑	↑	↑
Thiamine (B1)	↑	↑	↑	↑	↑	↑
Riboflavin (B2)	↑	↑	↑	↑	↑	↑
Niacin (B3)	↑	↑	↑	↑	↑	↑
Pantothenic Ac. (B5)	↑	↑	↑	↑	↑	↑
Pyridoxine (B6)	↑	↑	↑	↑	↑	↑
Biotin (B7)	↑	↑	↑	↑	↑	↑
Folic Acid (B9)	↑	↑	↑	↑	↑	↑
Vitamin C	↑	↑	↑	↑	↑	↑
Vitamin E	↑	↑	↑	↑	↑	↑
<b>Higher Content</b>	<b>14 / 4</b>	<b>15 / 3</b>	<b>18 / 0</b>	<b>16 / 2</b>	<b>11 / 7</b>	<b>13 / 5</b>

*Multiple scientific investigations have demonstrated*

- *that Moringa oleifera is the most nutrient-dense plant ever identified,*
- *and the only plant on the earth to have 96 nutrients and 46 antioxidants.*

**Prof. Dr. Shivangi Srivastava**

Quelle: Srivastava, Shivangi, et al. "Dynamic bioactive properties of nutritional superfood Moringa oleifera: A comprehensive review." *Journal of Agriculture and Food Research* (2023): 100860.







# MORINGA LEAVES FOR MALNUTRITION AND HUNGER

Main component of Kenyan Ugali

Upgrading corn flour (100 g) with one teaspoon of moringa powder (2,5 g)



Nutrient or vital substance	Unit	100 g 	100 g 	2,5 g  Plus to ingredients substances
<b>Protein</b>				
Gesamtgehalt	g	27,2	8,0	2,5%
<b>Minerals</b>				
Calcium	mg	1944,5	18,0	270,1%
Magnesium	mg	451,4	470	24,0%
Iron	mg	27,8	2,4	29,0%
Phosphorus	mg	298,3	256,0	2,9%
Potassium	mg	1503,5	120,0	31,3%
Copper	mcg	860,0	180,0	11,9%
Zinc	mcg	2480,0	2500,0	2,5%
<b>Vitamins</b>				
Beta-Carotene	mcg	21267,0	300,0	177,2%
Thiamine (B1)	mcg	1720,0	440,0	9,8%
Riboflavin (B2)	mcg	7930,0	130,0	152,5%
Niacin (B3)	mcg	8270,0	1930,0	10,7%
Pantothenic Ac. (B5)	mcg	2590,0	550,0	11,8%
Pyridoxine (B6)	mcg	2050,0	60,0	85,4%
Biotin (B7)	mcg	92,9	6,6	35,2%
Folic Acid (B9)	mcg	788,5	8,0	246,4%
Vitamin C	mg	133,1	0,0	
Vitamin E	mg	90,0	1,5	150,0%

Sorghum as main components of Kenyan Ugali

Based on production volume,

- corn (1200 million tonnes),
- rice (513 million tonnes)
- wheat (784 million tonnes)
- Barley (143 million tonnes)

make up 92 % of the most cultivated grains worldwide (source: statista 2024).

**These and other foodstuffs actually contain enough calories, but eating the same food every day inevitably results in deficiencies.**

The main supplier of calories in many African countries, for example, is a plain mash made from ground maize or sorghum and water. When the economic situation is bad or the harvest poor, the mash is served with few or no vegetables added.

**This results in sickness caused by lack of nutrients and protein, because the staple food just doesn't offer enough nutrition.**

**And:** *The image of the hungry, emaciated child is not representative of the extent of the problem, according to Shawn Baker of the Helen Keller Foundation. Behind each hungry child stand ten, who, although not visible, are more or less malnourished, i.e. are affected by hidden hunger.*



# THE CONSEQUENCES OF CHRONIC MALNUTRITION

Concentration disorders, sleep disorders, irritability, infirmity, apathy, depressive mood swings

Sensory organ disorders

Reduction in heart muscle mass, torn muscle fibre, cardiac arrhythmia

Reduced pulmonary function, increased risk of pneumonia

Reduction in liver detoxification and immune defence

Muscular atrophy per week:  
20 % reduction in red muscle fibres

Reduced bone density by up to 15 %

Increase in skin inflammation, poor wound healing ability



Insufficient stomach acids, shrinkage of the intestinal villi, dysfunctional nutrient utilisation, damage to the intestinal flora, water retention (hunger edema)

**Moringa grows exactly where the plant is needed most to combat poverty and hunger**



# IN AFRICA, IT IS CALLED 'NEBEDAYE', WHICH MEANS 'NEVER DIES'



*Moringa is the true gold of the countries around the equator. Wherever we set up children's tables and distribute the nutritious moringa porridge to save the little ones, we also focus on training parents so that they can grow and harvest moringa themselves.*

Kerstin Rück-Schröder, Wiehl-Hilft e.V.

*The most workable seems to be utilizing a local, fairly widespread, yet underappreciated plant: the moringa tree. It is a that has all the properties needed to complement the nutritional value children receive without a huge expense.*

*From the data we have, tested in other African countries and verified by a number of universities, all a malnourished child needs to be treated is a teaspoonful of moringa powder every day for three months in order to regain strength and weight”.*

Vatican News, the information portal of the Holy See

*As a small tree that is resistant to drought, moringa could be an important helper in the fight against malnutrition. Its leaves are very rich in protein, calcium and potassium, as well as iron and vitamins A and C.*

CEAS – Centre Ecologique Albert Schweitzer

*Despite the profound metabolic disturbances caused by malnutrition and infections, Moringa oleifera provides good nutritional recovery in malnourished patients infected with HIV or not. No infection occurred in children receiving Moringa.*

Urbain Zongo, Universität Ouagadougou Burkina Faso





# GROWING MORINGA



## BENEFITS FOR CHILDREN

- Strengthening physical, intellectual and social development.
- The cohesion of the children, carers and workers is promoted.
- Environmental awareness and appreciation of nature increases.
- Self-sufficiency with essential nutrients and vital substances.
- Better health increases energy and concentration for school.
- The responsibility strengthens self-esteem and makes the children proud of the project.
- Imparting agricultural knowledge and successful cooperation.
- Knowledge and entrepreneurial thinking increase the chances of a successful future.
- Moringa powder stimulates the milk flow of breastfeeding women by increasing prolactin levels and has a positive effect on the baby's sleep duration (Brar, Sumeer, et al. 2022, Sulistiawati, Yuni, et al. 2017).

*Education has improved too, with better attendance and higher grades, and students showing more interest in practical garden classes. Some students who previously had problems in class are responsible for the nursery and plants and are proud to be valued and to have information to share with other students.*

Source: MORINGA LEAVES, Trees for the Future (TREES) in: Biodiversity for Food and Nutrition Project





# THE CULTIVATION OF MORINGA AND TRAINING





## THE LEAVES

**First harvest the leaves:** 6-8 weeks after planting

**Next harvests:** with enough water every 6-8 weeks

**Pruning:** keeps the tree bushy and increases the number of leaves

## THE FRUITS

**First fruit harvest:** 8-10 months after planting

**Number of harvests per year:** 1-2 times

**Pruning:** keeps the tree small and increases the number of fruits





# MODULES FOR TRAINING





## Checking suitability

- Availability of agricultural land and workers 
- Climate 
- Vegetation 
- Soil quality 
- Contaminations 
- Supply of operating resources, water and energy 

## Breeding of Moringa

- Selection (wild seeds, cultivated seeds) 
- Pretreatment 
- Growing the seedlings
  - Nursery 
  - Sowing 
  - From Cuttings 

## Strategy and planning

- Planting density and mixed culture 
- Agricultural equipment and buildings 
- Required workers 
- Soil management 
- Microorganisms, Mycorrhiza 
- Use of biofertilizer 
- Cropping system 
- Pest control 
- Irrigation 
- Sowing period 
- Harvest time 
- Gentle harvesting 
- Weed management 
- Post harvest management

## Product manufacturing

- Hygiene and quality management 
- Separation 
- Type of drying and grinding 
- Packaging and storage 
- Quality of leaves and Products 
- Productions costs 
- Nutrition content 

## Sales and Marketing

- Certifications 
- Legal regulations, political stability 
- Product development 
- Marketing 
- Profit and competitive situation 
- Research and current information 
- Quality of employees and consultants 

## Good Manufacturing Practices (GMPs) and other optimisations

- In favour of high-yield, crisis-proof and environmentally friendly agriculture
- The basic required to produce safe foods
- For the manufacture of environmentally friendly products
- For job creation and economic growth
- The best long-term strategy for further investment and the future of agriculture in the tropics and subtropics



# TIMETABLE FOR THE IMPLEMENTATION



**Preparations**



**Building the Farm**



**Building a training center**



**Sales of own products**



**Research and Development**



**The goals:**

- Sustainable training projects
- Education and vocational training
- The creation of jobs and self-managed farms
- The expansion of production in the tropics and subtropics
- Partnerships and research for sustainable development

**With the world's most vital plant**



A young child is crouching in a field, carefully planting a small moringa tree sapling into the soil. The child is wearing a light-colored t-shirt and dark shorts. The background is a soft-focus landscape with rolling hills under a warm, golden sunset sky. In the top left corner, there is a graphic of a stack of colorful sticky notes with a red pushpin, and the words "Thank you!" are written in a purple cursive font on the top note.

*Thank  
you!*

**PLANTING THE  
FUTURE  
TOGETHER WITH  
MORINGA**