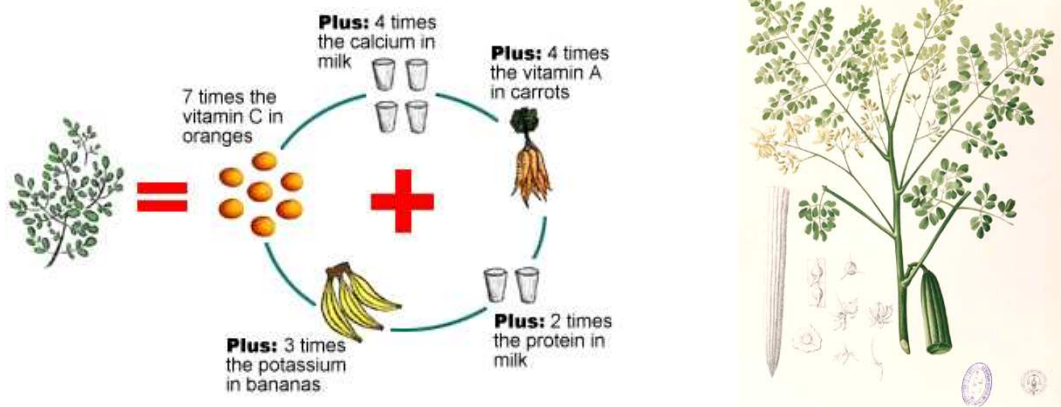


# Moringa Oleifera a Multipurpose Tree: Amandla Resources

## 1.0 Introduction:



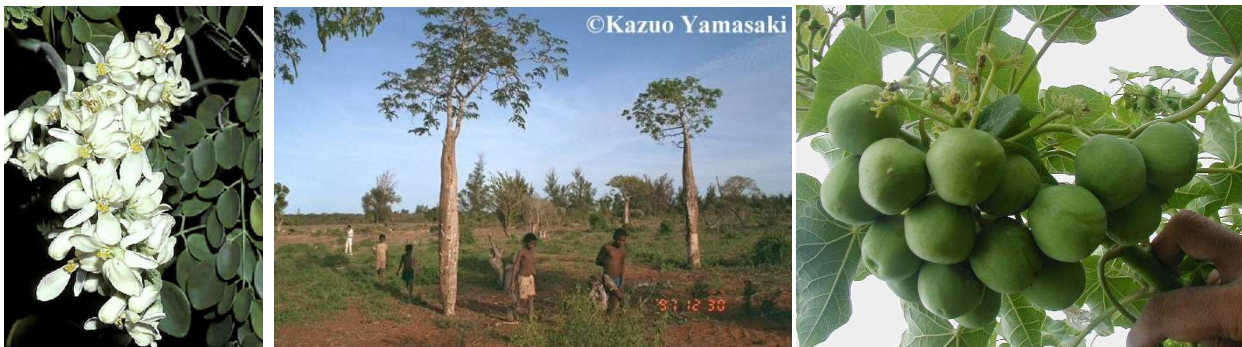
- 1.1 **Moringa Oleifera** belongs to the onogeneric family of shrubs and trees and originated south of the Himalayas in Northern India.
- 1.2 It is a fast growing tree having been known to grow 6 to 7 meters in a year in areas with less than 400 mm of rainfall. It is also known for its resistance to drought and disease.
- 1.3 The plant possesses many valuable properties which make it of great socio economic interest.

These include:-

- 1.3.1 High protein content of leaves, twigs and stems
  - 1.3.2 High protein and oil content of the seeds
  - 1.3.3 The large number of unique polypeptides in the seeds that can bind to many moieties.
  - 1.3.4 The presence of growth factors in the leaves
  - 1.3.5 High sugar and starch content of the whole plant
  - 1.3.6 Few parts of the tree contain any toxins that might decrease its potential as a source of food for animals and humans.
- 1.4 Environmentally it has a low demand for soil nutrients and water, production and management is easy. In any bio diverse environment it can be beneficial for both land owners and the surrounding eco systems. (Fordl N; Makhar H.P.S and Becker K.).

## 2.0 Characteristics of Moringa:

### Moringa Flowers & Fruit:



- 2.1 Moringa is a fast growing perennial tree which can reach a height of 7 to 12 m and a diameter of 20 to 40 cm.
- 2.2 Experiments have been conducted with various plant densities from 95 000 to 16 million per ha and the optimal spacing was found to be 1 m plants per ha. At this level a trial was observed over a 4 year period during which time 9 cuttings per year were harvested.
- 2.3 This high level of cuttings was made possible because of a strict regime of adequate fertilization and irrigation.
- 2.4 Even with regular irrigation throughout the year the yield per cutting varied from 45 tons in the dry season to 115 tons per ha in the rainy season.
- 2.5 If the goal is solely to maximize biomass output including roots then the higher seeding densities using hydroponic technologies could yield as much as 1000 tons per ha per year.
- 2.6 The productivity of Moringa in industrial plantations is higher than that of any other plant.
- 2.7 Further trial would be needed to determine in the longer term how this level of productivity can be sustained and at what costs.
- 2.8 Large amounts of minerals will be needed per ha per year to maintain productivity at the suggested plantation density of 1 m per ha. A systematic evaluation of fertilizer requirements under local conditions is necessary.

## 3.0 Moringa Plants & Uses:

### 3.1 Human Consumption

- 3.1.1 Young leaves are edible and are commonly cooked and eaten as spinach or in soups and used in salads. They contain vitamins A, B and C and minerals particularly iron.

- 3.1.2 Young green pods are very tasty and can be eaten as like green beans.
- 3.1.3 Flowers can be eaten as a tasty addition to salads
- 3.1.4 Dry seeds can be ground to powder as a seasoning sauce.
- 3.1.5 Roots can be dried and ground to powder as a seasoning base with a flavor similar to horse radish. (Moringa has also been referred to as the Horse Radish tree in some areas)
- 3.1.6 The resin from the tree trunk is also useful for thickening sauces. (Delaveau & Boiteau, 1980).

### **3.2 Industrial & Other Uses:**

- 3.2.1 The oil content of the de husked seed (kernel) is approximately 42% and is a brilliant yellow. The oil
  - 3.2.1.1 Is used as a lubricant for fine machinery such as watches because it has little tendency to deteriorate and become rancid or sticky.
  - 3.2.1.2 Is useful as vegetable cooking oil.
  - 3.2.1.3 Because of its capacity to absorb and retain volatile substances it is valuable in the perfume industry for stabilizing scents.
  - 3.2.1.4 "Moringa Milk & Body Lotion" is marketed internationally by The Body Shop as Moringa seed oil.
- 3.2.2 Water Purification. The press cake obtained as a by-product of the oil extraction contains a very high level of protein. This protein can be used as a non toxic natural poly peptide for sedimenting mineral particles and organics in the purification of drinking water.
- 3.2.3 This characteristic additionally allows the press cake to be used for cleaning vegetable oil or for sedimenting fibers in the juice and beer industries. It thus works as a primary coagulant. In contrast industrial coagulants such as alumina can be toxic.
- 3.2.4 Plant Growth Enhancers. The extract obtained from the leaves of the Moringa, in 80% ethanol, contains growth enhancing principles. The extract can be used in the form of a foliar spray to accelerate the growth of young plants. This causes the plants to be firmer, more resistant to pests and disease and produce more and larger fruit.

### **3.3 Moringa as a Biogas Source:**

- 3.3.1 Approximately 30 day old plants were milled together with water. Fibers were separated and the liquid fraction produce was then added to a biogas reactor. With an average feed of 5, 7 g of solids the gas production was 580 liters per kg of volatile solids.
- 3.3.2 The average methane content was 81%.

### **3.4 Moringa as a Forage Plant for Livestock:**

- 3.4.1 The nutritional characteristics of the Moringa tree are excellent as fresh forage for cattle.
- 3.4.2 Leaves are rich in protein, carotene, iron and ascorbic acid and the pod is rich in amino acid lysine. (CSIR, India; Chawia et al., 1998; Dogra et al., 1975).
- 3.4.3 Experiments have shown that both the extracted and un extracted are a good source of protein for livestock (Makkar & Becker, 1996).

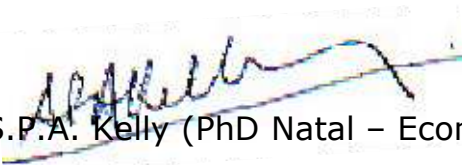
## **4.0 Potential Areas for Moringa Cultivation:**

- 4.1** Large scale cultivation of Moringa has been initiated in Malawi, Kenya, India, Tanzania and Nicaragua suggesting similar climates elsewhere should be suitable for Moringa cultivation.
- 4.2** In South Africa one of the areas which would be suitable is Northern KZN. This area stretches between Swaziland and the Indian Ocean and lies immediately south of Mozambique and north of Lake St Lucia. This area's geography may be broadly described as follows :-
  - 4.2.1 Altitude. Most of the area is flat and below 200m.
  - 4.2.2 Topography. Being flat the area lends itself to cultivation of perennial species that can be irrigated where water is available.
  - 4.2.3 Soil. The soil is sandy and has comparatively few alternative economic uses. Moringa would need a fertilizer regime to suite the area.

- 4.2.4 Rainfall. Rain is between 800 and 1100 mm a year and Moringa requires only 400 mm for normal dry land cultivation.
- 4.2.5 Vegetation. This is typical sand veldt with scattered bush veldt acacia and Lala palms.
- 4.2.6 Temperature. During summer months as high as 40 degrees C and in winter under 20 C.

## 5.0 Acknowledgements.

Fordl N., Makkar H.P.S. and Becker K. "The Potential for Moringa Oleifera for Agricultural and Industrial Uses" 2001. Dar-es-Salaam.



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