

CHAPTER 1

Introduction

Moringa (*Moringa oleifera* Lamk) is considered to be one of the most useful plants on the earth, as a nature's gift to the mankind, because every part of the plant can be used, as food, feed, medicine and industrial raw material. It is indigenous to lower sub-himalayas extending from Afghanistan through Pakistan, India and Nepal (Fig. 1.1) (Fahey, 2005). Moringa belongs to the genus "*Moringa*" of family *Moringaceae*. The genus '*Moringa*' has 13 species, which are native to Indian subcontinent and Africa. Out of the 13 species, *Moringa oleifera* Lamk is well known and widely cultivated throughout the world compared to other species. Besides *M.oleifera*, *M.stenopetela* and *M.concanensis* are found in Indian sub-continent.

The name "Moringa" has derived from a Tamil word "Murangai". It is commonly known by several names in different languages and different regions of moringa growing. Other names of *Moringa oleifera* include drumstick (because of the typical shape of its fruit as drumstick used for beating the drum), horse radish tree (because of the typical flavour of roots that of horse radish roots), ben-oil tree (after the seed oil extracted from the seeds), miracle tree (as it provides nutritional, medicinal and industrial benefits), never die tree (since it survives even under harsh situation), mothers' best friend (as it increases the milk quantity of nursing (lactating) mothers), tree of life (as it provides several nutrients, vitamins, antioxidants and cures malnutrition in infants and young children). Moringa has a long history dating back to pre-Christian era and is known to Egyptians, Greeks, Romans and Indians (see history of moringa). Moringa is well known in India, as evident of its mention in ancient medical books/systems of medicine like Ayurveda, Charaka Samhita etc.

However, moringa has disappeared in the medieval period, but it was confined to rural areas. During the mid-20th century it was rediscovered and gained importance gradually not only in India, but also in other countries notably in Africa, where it is primarily cultivated for fodder and for combating malnutrition in children. According to

Fuglie (2001) moringa has gained popularity as a source of nutrition that can feed the needy and save lives as well. In recent times *M.oleifera* has gained a lot of popularity due to recent discovery of its usefulness to mankind with regard to nutrition and health of humans. Further, its wide ecological adaptability, low demand for soil nutrients, and water and relative ease with which it propagates through both sexual (seed) and asexual (cuttings) means, make its production and management easy, which was also considered as a reason for its popularity and spread of cultivation.

Interest in moringa in recent times is skewed towards its medicinal, pharmaceutical and nutraceutical attributes, hence much research has gone into these aspects as evidenced from volume of literature published. Moringa gained importance due to its multiferous uses. It has significant economic importance because of its several industrial uses. Moringa is a boon to the farmers which gives income particularly in poor and marginal lands. It satisfies the demand in alleviation of malnutrition. Moringa seed oil is a much sought commodity in the formulation of skin care products and delicate machinery and making biodiesel and has great demand in international markets.

Moringa is a store house of nutrients, vitamins, minerals, amino acids and antioxidants. Each and every part of the plant is edible and useful with its own nutrition, flavour and taste. It is one of the most incredible plant endowed by the divine as its nutritional and medicinal properties have immense potential to manage malnutrition, prevent and heal many human maladies numbering 300.

Moringa provides multiple uses, due to its nutrient rich parts with medicinal properties etc. It has several uses and utilization. According to Fuglie (1999) the many uses of moringa include both for humans and animals, medicinal and industrial. It is useful in agro-forestry, agri-horti-silvi programmes, in checking soil erosion, thereby conserving soil, in reclamation of mined areas and improving soil fertility through its leaf litter. The most useful contribution of moringa plant is combating malnutrition of infants in developing countries.

In view of its richness in nutrients and medicinal properties, there is great demand for moringa products and by products, which is ascending along with time. Great demand exists for its pods throughout India followed by its leaves. The demand for leaves both for human and animal consumption exists in Africa and Philippines. In Europe there is

much demand for byproducts of moringa as nutrient supplements and cosmetics. Of late, the demand for seed risen much for its oil, useful in delicate machinery, and making of biodiesel and seed powder for water purification and seed cake as manure. There is much demand for seed for raising new plantations of moringa. The demand for products and by products of moringa is increasing by leaps and bounds year by year, as evidenced by the volume of trade and income out of such demand.

Several benefits have been noticed due to cultivation of moringa. It can be grown throughout the year at minimum cost. Ratooning of the crop is a boon for the moringa farmer as it avoids establishment of the crop every year like other vegetable crops. Moringa promotes environmentally sound economic development of a region. It alleviates poverty, malnutrition and nutritional deficiencies. The crop provides a life to the drought prone areas, with scanty rainfall and helps in providing beneficial land use and nutrition to humans and animals. It has a vital role in providing food security throughout the year at cheap cost.

Cultivation of moringa has great prospects because of the increasing awareness of its nutritional and medicinal values and thereof. Further, its cultivation has proven more remunerative at less cost of production. Moringa being perennial offers long life for more than 15-20 years in the same field, hence investment is comparatively less and non-recurring. People in drought prone areas are much benefited because of high returns from drumstick cultivation (see success stories). Contract farming is also possible in moringa. It is a versatile crop that can be grown as a solitary tree for vegetable purpose (pods) and seed purpose, as a perennial crop and under intensive cultivation for fodder. It is a potential crop for dryland horticulture and can be successfully grown on marginal, cultivable waste lands, degraded soils and mined areas. Moringa is a climate change adaptable crop and hence is suitable to mitigate climate change (Ndubuaku et al., 2014). Hence, its introduction into different agricultural land use systems can be beneficial to both the farmer and surrounding ecosystems (Foidl et al., 2001). It can be grown in areas with high temperature and low water availability and scant rainfall, where it is difficult to grow other agricultural / horticultural crops.

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In view of the above, cultivation of moringa has bright prospects provided the Government encourages farmers, particularly in drought prone areas to start moringa cultivation by creating awareness among the farmers about its high returns, nutritional, medicinal and industrial value, through extension programmes.

However, the cultivation of moringa is beset with some problems which can be solved through research by establishing a 'Moringa Board' on the line of 'Tea Board' and 'Coffee Board'.