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## A study on economic viability of Moringa in dryland regions of Maharashtra: With special reference to value addition and export aspects

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### Abstract

India is the largest producer of a drumstick (*Moringa*); several benefits can be derived from all parts of *Moringa*. *Moringa* is coming into view as future crop considering its wider adoptability and tolerance to the severe drought conditions. The present work was taken up to investigate the economic viability of the production and local as well as global demand of *Moringa*, its value addition and export aspects. More than 80% of the *Moringa* products demand is fulfilled by India. It is essential to develop a roadmap to engage its potential for the well-being of humankind. The global *Moringa* Products market estimated to be over US\$ 4.6 billion is highly dependent on India. With the unification of *Moringa* farming, *Moringa* processing, *Moringa* value addition and export, incomes and livelihoods of dryland people will be supported because *Moringa* cultivation is economically viable and it gives multifold income with low cost of investment. Hence, *Moringa* Agriculture fosters the sustainable growth and in future may provide opportunities for new green revolution.

**Keywords:** *Moringa*, drylands, processing, value addition, sustainable growth

### Introduction

The success of *Moringa oleifera* of the family Moringaceae, also known as *Moringa* or drumstick, an Indian origin plant has attracted the advertency of researcher's across the globe for its miraculous properties and its distinguishing quality. India is the largest producer of the drumstick which contributes (41%) of the global production followed by other tropical parts of the world like western Africa (33%), Malesia and Philippines (12%), China (8%) and Venezuela (6%). Hence, countries like Ethiopia, the Philippines and the Sudan, tropical Asia, East, West and South Africa, the Caribbean, Latin America, the Pacific Islands and Florida are the enormous producers of *Moringa* across the world. Among Indian states, Andhra Pradesh leads in area and production followed by Karnataka, Tamil Nadu and Maharashtra. According to IMD, out of its average normal rainfall, every year Maharashtra receives more than 55% rainfall deficit. Especially Marathwada has been always badly affected by drought and other regions falls under rain fed area. Farmers from that regions are totally depends upon rainfall for their livelihood, hence they have only one option either to grow selected cereal crops (Jowar, Bajra etc.) or to keep their land fallow in summer and rabbi. Hence there is need of diversification of cropping pattern for the farmers of respective dryland regions with looking forward to the magical tree like drumstick. Several benefits can be derived from all parts of *Moringa*; each and every part of this tree is being utilized by humans for consumption and other medicinal needs too. *Moringa* is coming into view as future crop considering its wider adoptability and tolerance to the severe drought conditions. Several benefits can be derived from all parts of *Moringa* tree, hence there is no doubt while saying, "Drumstick is like kalpvriksha of dryland regions".

### Objectives

1. To study the economic viability of drumstick cultivation and major markets for drumstick.
2. To know about the value addition and export related aspects of the *Moringa*.

### Methodology

#### Study area

Present study was carried out in marathwada region of Maharashtra state. 10 farmers each from the eight districts (Jalna, Aurangabad, Parbhani, Hingoli, Nanded, Latur, Osmanabad and Beed) which comes under Marathwada region and farmers who are growing *Moringa* from past few years are purposively selected. Hence total sample size is 80.

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**Nature and sources of data**

Both primary as well as secondary data were used in the present study. Primary data was collected from the farmers with the help of well-structured questionnaire through personal interview method. Secondary data collection was done by using various website like MSAMB, APEDA, EXIM etc. newspapers as well as reports on outcomes of global Moringa meets (Jaipur, Rajasthan).

**Analytical tools**

To know the economic viability of Moringa cultivation Cost benefit ratio is determined by dividing current value of benefit by the current value of cost of production.

$$\text{Cost-Benefit Ratio} = \frac{\text{Total Returns}}{\text{Total cost of Production}}$$

Tabular analysis was done for the value addition and export related aspects

**Results and Discussion**

**Table 1:** Cost Benefit ratio of Drumstick Cultivation

S.No	Particulars	Cost(Rs/Acre)
1	Seeds	1250
2	Preparation of land	1700
3	Labours	3100
4	Plant protection Measure and fertilizer Application	11000
5	Intercultural operations	4200
6	Watering ,Harvesting Marketing	5800
7	Total Cost Of the Production	27050
8	Yield: 08-09tonnes/acre*Rs.09/kg Of Price	81000
9	Benefit-Cost Ratio	1:2.99

**Table 2:** State wise major markets and average prices of drumstick in India

State	Major Markets	Price(Rs/Qtl)
Andhra Pradesh	Anantpur, Karnool, Guntur, Nellore	2000-5000
Telangana	Bowenpally,Gudimalakapur,L.B.Nagar	5000-10000
Karnataka	Binny Mill (F&V) Bangalore, Mysore (Bandipalya), Gulbarga, Bagalkote, Davangere	2000-4000
Maharashtra	Mumbai, Kalyan, Karad, Satara, Aurangabad Ahemadnagar, Parbhani, Kolhapur,Pune,Nashik	3000-8000
Kerala	Pampady,kanjangadu,Alappuzha, Aluva, Chanthroor, Chelakkara, Chengannur, Kollam, Kothamangalam,	5000-21000
Orrisa	Jajpur, Mottagaon, Parlakhemundi	10000-12000
Gujarat	Ahmedabad, Vadodara, Dahod (veg.Market), Sayajipura, padre	3000-6000

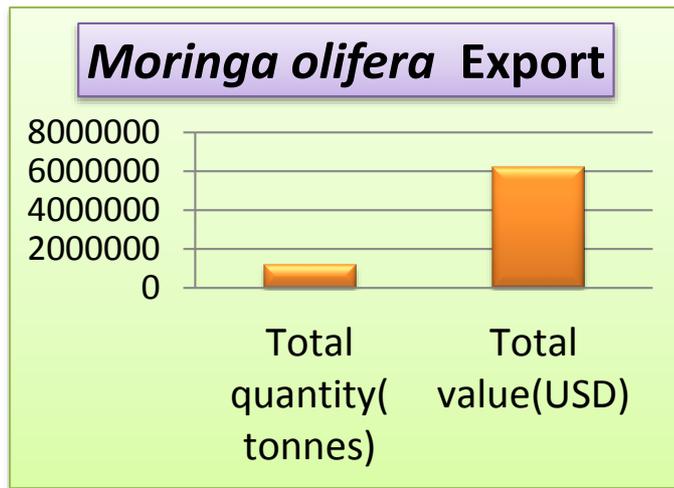
**Table 3:** Total Export of Moringa olifera from India in 2017

Total quantity( tonnes)	Total value(USD)
1181468	6249658

**Table 4:** Value added Moringa products and their export destinations

Products	Destination
Moringa Seed oil	United States
Moringa Oil	Germany
oil &Capsules	South Korea
Leaves, Capsules, Tea	Japan
Dry leaves, Capsules, Powder	Thailand
Leaves, Capsules, Oil	France
Oil, Organic Moringa	Switzerland
Moringa Seeds, Powder	China, Hong Kong

**Fig 1:** Total Export of *Moringa oleifera* from India



**Fig 2:** Value added products of *Moringa oleifera*



It was observed that, the cost benefit ratio of drumstick cultivation was worked out. It is observed from the Table 1, the Moringa farms incurred the expenditure of one rupee could get the benefit of rupees 2.99. Hence, with low cost of investment and with returns in same year of cultivation, drumstick is an economic viable one. Table 2 shows that Bowenpally in Telangana, Pampady and Kanajangadu markets in Kerala, Mumbai, Pune, Nashik markets in Maharashtra, Jajpur market from Orrisa, Vadodara and padre market in Gujarat are major markets of India where drumstick is traded. Kerala and Telangana there is ample market for drumstick throughout the year because it is an essential ingredient of the south Indian recipes, hence provides highest average price per quintal of Moringa. Due to migration of people to urban areas and more number of Dosa corners and Udupi restaurants, drumstick is in higher demand as well as

fetching better average prices than other vegetables. Various value added products can be prepared from Moringa such as leaf powder, Moringa oil, Moringa health drinks, Moringa chocolate and cakes, Moringa tea(with pomegranate, Mint, Masala etc. flavors),Moringa soap and Moringa honey. Due to its distinguishing quality and highly nutritious value, there is extensive demand for Moringa products like Moringa leaves, capsules, oil etc. Table 3 shows that total export of *Moringa oleifera* from India was 11, 81,468 tonnes and received value for it as 62, 49, 658 USD. India is dominating country in global market of Moringa leaf powder. United States, Germany, South Korea, Japan, Thailand, France, and Switzerland are major export destinations for the value added Moringa products. Global Moringa product market is expected to grow by 10% annually up to 2020 and expected to reach over 4.6 billion US\$ which is highly dependent on India.

### Conclusions

Each and every part of drumstick tree is useful for the wellness revolution of mankind. It is most suitable crop for dryland regions because it requires less water compared to other crops and it is economically viable as well as gives multifold income with low cost of investment. With unification of Moringa farming, Moringa processing and value addition, incomes and livelihoods of dryland people will be supported. Hence there is need of awareness among the farmers for Moringa cultivation, major markets of Moringa products, export specification and procedures with the intervention of state agricultural universities, research stations, NGO's and SHGs in drought affecting areas. Hence Moringa agriculture will foster the sustainable growth and in future may provide opportunities for new green revolution.

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