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Moringa oleifera as a Source of Economic Empowerment for Farmers in Kaduna State: a Case Study of Bomo Village, Sabon Gari Local Government Area

Olaifa, R. K.[1*], Famuyide O. O.[2], Nwokedi C. I.[1] and Adio A. F.[2]
[1]Savanna Forestry Research Station, Zaria, Forestry Research Institute of Nigeria.
[2]Forestry Research Institute of Nigeria, Ibadan.
*Corresponding Author: olaifais@gmail.com (+234 805 234 2241)

ABSTRACT

The study investigated the use of *Moringa oleifera* as a source of economic empowerment for farmers in Bomo Village, Sabon Gari Local Government Area of Kaduna State. Twenty farmers whose previous knowledge of the tree was first investigated through oral discussion were randomly selected to participate in the study. Specifically, the study identified the farmers' socio economic characteristics, awareness level about the tree and their willingness to go into the commercial cultivation of Moringa.

Group discussion, oral interview as well as self administered structured questionnaires were used to obtain information from the farmers. Simple descriptive statistical techniques such as frequency counts and percentages were equally used to summarize the data collected. Gross margin analysis that was used indicated that for every hectare of Moringa plantation established, the farmer stands to realize an average income of two hundred and thirty seven thousand, four hundred naira (N237, 400) which is more profitable when compared to other arable crops being cultivated in the study area.

The study also revealed that most of the farmers were not aware of the modern ways of propagating *Moringa oleifera* and its uses while the vast majority representing 95% of the group indicated their readiness to go into the commercial cultivation of *Moringa oleifera* after being trained.

Key words: Moringa oleifera, economic empowerment.

INTRODUCTION

Moringa oleifera Lam*,* a tropical multipurpose tree is one of the world's most useful plants. It is a fast-growing tree and is grown throughout the tropics for human food, livestock forage, medicine, dye, and water purification among others (Palada and Chang, 2003).

Moringa is considered a "Miracle tree" because all its parts are used, especially for their pharmacological and nutritional properties. Leaves are eaten as vegetables and pressed; they are used in traditional pharmacology to treat many ailments. The fruits are mainly used in condiments or cooked as vegetables. Flowers produce nectar and have anti-inflammation properties. The wood provides a blue dye and is used as fuel (Singh, 1982).

Moringa oleifera is cultivated and has become naturalized well beyond its native range, including throughout South Asia, and in many countries of Southeast Asia, the Arabian Peninsula, tropical

Africa, Central America, the Caribbean and tropical South America (Francis and Liogier, 1991). The tree usually grows to 10 or 12 m in height, with a spreading, open crown of drooping, brittle branches, feathery foliage of tripinnate leaves, and thick, corky, deeply fissured whitish bark. It is valued mainly for its edible fruits, leaves, flowers, roots, and seed oil, and is used extensively in traditional medicine throughout its native and introduced ranges (Lahjie and Siebert, 1987).

Furthermore, the raw seeds are valuable because extracts have a flocculating protein that works as a coagulant of surface muddy and turbid water to tap-water in many African and Asian countries and Central America. Now that research and pilot scale tests have been carried out, consideration is being given to the production and use of the Moringa as coagulants at national and international levels. In Tanzania, a Franco- Swiss company has started large-scale production of Moringa seeds to that end. The oil extracted from the seeds is not only comparable in terms of quality to olive oil as oil for human consumption, but is also a raw material used by the cosmetic industry (Abdulkarim *et al*., 2005).

Moringa oleifera is also a food-producing plant. In India, it is cultivated for the production of its fruit while in the Sahelian zones of Africa; its leaves are eaten as a vegetable. The exceptional content in proteins, starch, minerals and vitamins of Moringa leaves have led to it being used as a food supplement in programmes to combat malnutrition and related diseases (Rebecca *et al*, 2006).

Research is also being carried out into the powers of the powder extracted from its leaves to boost the immune system, in particular with regard to HIV patients. *Moringa oleifera* is also of interest for cancer research because of its production of compounds with antibiotic activity such as the glucosinolate 4 alpha-Lrhamnosyloxy benzyl isothiocyanate (Fahey, 2005).

Studies from around the World illustrate how wild resources often form an integral part of livelihood. Wild resources provide materials for utensils and construction, and contribute to improved diets and health, food security, income generation, and genetic experimentation. These resources are typically associated with hunting and gathering societies where they often have special cultural significance, but they also play important roles in intensive or specialized agricultural systems (Scoones *et al*., 1992).

In the tropics, *Moringa oleifera* is used as foliage for livestock. It is an exceptionally nutritious vegetable tree with a variety of potential uses. The relative ease with which it propagates through both sexual and asexual means and its low demand for soil nutrients and water after being planted makes its production and management easy. Introduction of this plant into a farm which has a bio-diverse environment can be beneficial to both the owner of the farm and the surrounding eco-system (Foidl *et al*., 2001).

Uses of Moringa

All of the parts of the tree can be used in a variety of ways. They are as follows:

- human nutrition and natural medicines;
- animal fodder;
- nater purification;
- animal nutrition;

- environmental uses;
- agroforestry;
- fertilizer/Plant growth hormone;
- oil;
- fuel wood;
- biogas production and
- apiculture.

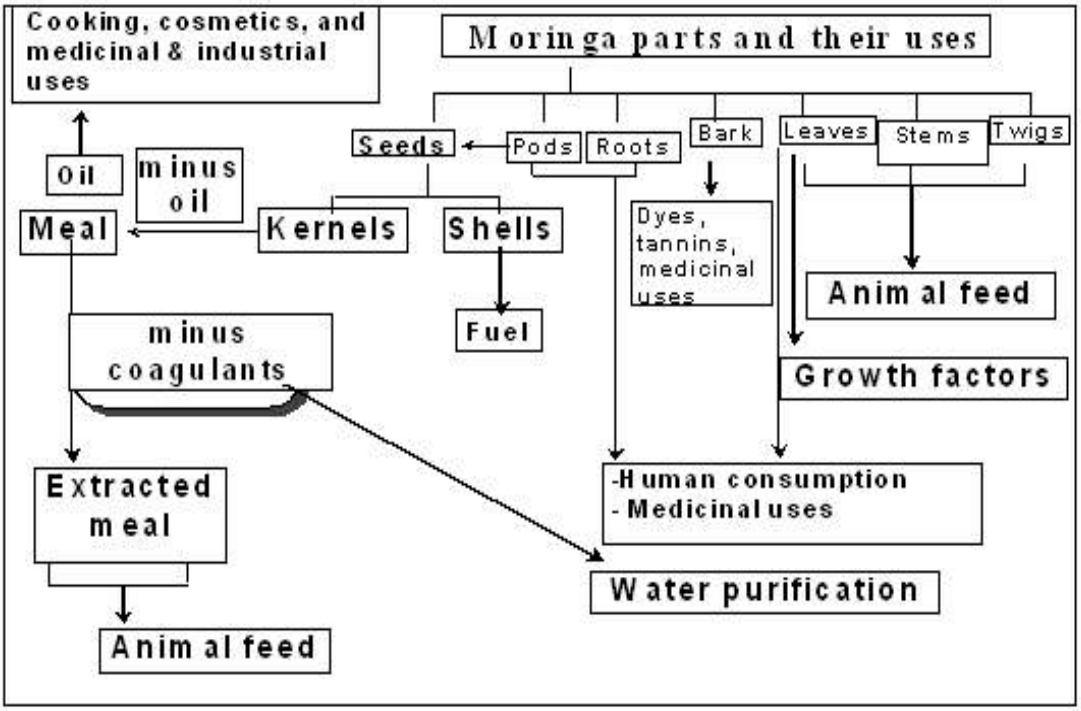

Figure 1: Uses of different parts of Moringa

Source: (Foidl *et al*., 2001).

Objectives of the Study

The general aim of this study is to promote the use of Moringa oleifera as a source of economic empowerment for farmers in Bomo village, Sabon Gari Local Government of Kaduna State.

The specific objectives of this study are to:

A. describe the socio-economic characteristics of Moringa farmers in Bomo Village;
b. investigate the knowledge of farmers about Moringa tree;
c. assess the willingness of farmers to engage in Moringa cultivation and
d. determine the gross margin analysis for the commercial cultivation of Moringa

MATERIALS AND METHODS

Study Area

Bomo village is located in` Sabon Gari Local Government Area of Kaduna State in Nigeria and lies between latitude $11^0$4 North and longitude $7^0$4 East which is in the northern Guinea Savanna agro-ecological zone of Nigeria. It is located along the Funtua-Sokoto road and very close to Samaru in Zaria, Kaduna State. The village is located 8km North West of the Ahmadu Bello University, Zaria. The village which is under traditional supervision of the farming Zazzau Emirate is a largely agrarian community as the main occupation of the inhabitants is arable farming while a few are into fishing and trading.

Sampling Procedure

A reconnaissance survey was first carried out to assess the prevalent nature of *Moringa oleifera* on individual farms after which a list of possible farmers that will be sampled were made. As a result of the reconnaissance survey, a total number of twenty (20) willing farmers that cut across the nooks and crannies of the village were selected to participate in the study. For ease of management, a leader was selected among the farmers to facilitate the smooth conduct of the training and awareness programme. The following criteria are used in selecting the participating farmers. They were farmers who:

- were already into Moringa propagation for commercial purposes;
- have Moringa trees on their farms either as hedge plants or in scattered formation;
- inherited the trees on their farms and
- do not have Moringa trees on their farms but showed willingness to go into its cultivation.

Method of Data Collection

For the purpose of this study, focus group discussion, oral interview and the use of structured questionnaires were employed. By making use of the focus group discussion, participating farmers felt at ease during the interactions and contributed positively to the success of this study.

Table 1: Summary of Socio- economic characteristics of respondents

Variables	Frequency	Percentage (%)
Age		
23-35	4	20
36-45	3	15
46-55	8	40
56-65	4	20
66-75	1	5
Marital Status		
Married	15	75
Single	2	10
Widowed	1	5
Divorced	2	10
Education		
Non formal	5	25
Primary education	6	30
Secondary education	9	45
Land Size		
1-2 ha	2	10
2-3 ha	10	50
3-4 ha	4	20
4-5 ha	4	20

Source: Field Study, 2010

Table 2: Respondents other Variables

Variables	Frequency	Percentage (%)
Source of Moringa trees		
Planted	5	25
Inherited	9	45
From wildlings	6	30
Aware	2	10
Not aware	18	90
Willingness to embark on Commercial cultivation of Moringa		
Willing	19	95
Not willing	1	5

Source: Field Study, 2010.

ANALYTICAL TECHNIQUES

The tools used in analyzing the data were descriptive statistics, farm income and expenditure based on farm budgeting. The descriptive tools included tabulations, percentages (%) and farm profit through Gross Margin and Net Farm Income. The Gross Margin Analysis is particularly used as it measures cost and benefit of farm enterprises. Gross Margin is the difference between Gross Farm Income (GFI) and Total Variable Cost (TVC) expressed as GM = GFI TVC (Olukosi *et al*; 1988).

Table 3: TOTAL VARIABLE COST

Cost of Production for One hectare (1 ha) of *Moringa oleifera* Plantation at 3 X 3m

Operation/Activity	Quantity	Unit Cost (₦)	Total Amount (₦)
Land clearing	Lump sum		6, 500
Demarcation and Pegging	Lump sum		2, 500
Seedlings	1000	30/seedling	30, 000
Organic fertilizer	4 bags	3, 500	14, 000
Planting	Lump sum		1, 500
Weeding	Lump sum		2, 500
Cost of harvesting	Lump sum		1, 500
Cost of Processing	Lump sum		3, 500
Empty bags	10	60/bag	600
Transport			1, 500
Logistics			3, 500
Total			67, 600

Source: Field Study, 2010.
Total Variable Cost (TVC) = ₦67, 600

Total Revenue

A Moringa Leaf Production

- 1 ha of *Moringa oleifera* plantation planted @ 3 × 3m apart = 1, 000 trees
- 1 *Moringa oleifera* tree yielded 4.5kg of fresh leaves
- 1,000 trees yielded 4,500kg of fresh leaves
- After drying, a 100kg standard bag containing 240kg of fresh Moringa leaves yielded 12kg of dry leaves.
- Therefore, 4, 500kg ÷ 240 = 18.75bags

- 18.75 × 12kg = 225kg
- At the current market price of ₦1,000/kg of dried leaves;

  225 × 1,000 = ₦225, 000

B Moringa Seed Production

- 1 ha of Moringa plantation yielded 10kg of processed Moringa seeds (@ year 1)
- At the current market price of N8,000/Kg of Moringa seeds;

  8,000 x 10 = N80, 000

  Total Revenue (TR) = N225, 000 + 80, 000

  TR = ₦305, 000

Gross Margin Analysis

GM = TR TVC

Where;

GM =Gross Margin

TR = Total Revenue

TVC = Total Variable Cost

GM = N305, 000 N67, 600

GM = ₦237, 400

RESULTS AND DISCUSSION

Table 1 shows that majority of the sampled farmers fall within the age bracket of 46-55 years representing 40 % of the respondents while 50 % of the farmers possess 2-3 ha of land for farming activities.

Table 2 also revealed that many of the sampled farmers were not aware of the multipurpose uses of the tree except for the traditional use of Moringa leaves as food and its tree for fencing. Most of the respondents also inherited the few Moringa trees found on their farms and homes and have not been introduced to the commercial cultivation of Moringa tree. The table equally shows that majority of the farmers indicated their willingness to embark on the commercial cultivation of Moringa tree after the study.

Table 3 revealed that the projected Gross Income of two hundred and thirty seven thousand, four hundred naira (N237, 400) per hectare was very encouraging going by the discussion held with the farmers who observed that the profit margin is attractive enough for them to venture into the commercial cultivation of *Moringa oleifera*.

CONCLUSION

The commercial cultivation of Moringa oleifera still remains unpopular among Nigerian farmers despite its acclaimed economic value and importance and this is due largely to lack of adequate information on the part of the farmers on the tremendous benefits derivable from its commercial cultivation.

This project led to the formation of a group comprising 20 farmers whose previous knowledge of the Moringa tree were examined and were subsequently trained on the modern and improved silvicultural practices of the tree as well as its management, processing and utilization.

In view of the above conclusion, it is therefore recommended that:

- the government, extension administrators, policy makers and the media should intensify efforts in the area of massive public awareness on the massive economic importance derivable from *Moringa oleifera;*
- State Ministries of Agriculture, ADPs and Local government Councils should embark on training programmes for farmers on new technologies in the cultivation of Moringa on commercial scales; and
- efforts should be geared up towards capacity building for farmers in the areas of Moringa leaf processing, packaging and sales which will yield more income and better their lives.

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