

# UNLOCKING AGRICULTURAL POTENTIAL: AN ECONOMIC ANALYSIS OF TRANSFORMING BARRAN LAND INTO LEAFY GREENS PRODUCTIVE ASSETS

## ABSTRACT

Amaranthus, commonly known as amaranth it is incredibly nourishing, abundant in calcium, iron, magnesium and potassium as well as vitamins (A, C and folate), fiber, protein and minerals. It is a significant supplement to diets because it offers a balanced array of critical nutrients, particularly in areas where malnutrition is common. Amaranth has a high nutritional content and is therefore very beneficial to health. It might improve heart health by lowering inflammation, cholesterol, and blood pressure. Its high fiber content also helps to maintain digestive health and may help with weight management. This research study is made about calculating the benefit cost ratio of greens cultivated in a barren land of total area about 22 cents in which five types of greens were cultivated. The benefit cost ratio of this study is 1:1.44 which denoted that the production resulted as beneficial and profitable. We summarize the chemical makeup of spinach, its health benefits, its relative safety, and its suggested dietary inclusion in this review article, which is based on data compiled from our labs and those of other researchers.

**Keywords:** Greens, Nutrition, Spinach, Net income, Gross income.

## INTRODUCTION

Amaranth is a member of the *Amaranthus* genus, which is part of the *Amarantaceae* family and has 70 species spread throughout tropical and subtropical regions. It is a C<sub>4</sub> photosynthetic plant species that is very productive, has a high genetic diversity and can adapt to a variety of soil and weather conditions, particularly dry soils and high temperatures. Amaranth species, including *Amaranthus viridis*, *A. d ubius* and *A. tricolor* have been extensively researched for their nutritional value in seeds and vegetables. There is a global need to find more affordable and easily obtainable food options in order to enhance the nutritional status of the populace (Beattie, James Herbert, 1948). In particular, there is a need to find new and high-quality protein sources that are not derived from animals or conventional grains. The selected greens are mainly consumed for its leaf and stem part. These greens can be made in to different kinds of sabzis and can be consumed along with dal, rice, roti etc., Apart from these it can also be consumed as salads. The average cooking time for greens is about 3 – 4 minutes. In this instance, the main objective of this study is to find out the yield of different Amaranth species cultivated in a 22 cent of land which is located in a semi-arid region of Virudhunagar district. In biological systems, spinach leaves, which have a number of active ingredients, including flavonoids, have antioxidative, antiproliferative, and anti-inflammatory effects. Numerous positive effects, including anticancer and antiaging properties as well as protection of the central nervous system and chemotherapy, have been shown for spinach extracts (Lomnitski, L et al., 2003). In India, Maharashtra, West Bengal, Gujarat, Andhra Pradesh, Telangana, Kerala, Tamil Nadu, Karnataka, and Uttar Pradesh are the states that produce the most spinach.

## METHODOLOGY

Related to Swiss chard and beets, spinach is a vegetable for cool weather. During the mild spring and fall temperatures, this quickly spreading plant produces a large number of leaves in a short period of time. It's important to extend the life of spinach plants when growing them, particularly in

the spring when longer days cause them to wither. The varieties which have been cultivated in the selected 22 cents of area are Indian spinach, greenamaranth, Chineseamaranth, Spinach and Sessile joyweed.

These are the varieties which have been selected according to the environmental and climatic conditions of the area chosen. These are easily grown and low-cost maintenance varieties.

## Result and Discussion

**Table 1. Nutritional value of selected greens**

S. No.	Botanical name	Family	Common name	Local name	Nutrition value
1	<i>Amaranthus dubius</i>	Amaranthaceae	Indian spinach	Araikeerai	Provides proteins, fibers, calcium, iron, riboflavin, niacin and vitamin C and is an excellent source of lysin.
2	<i>Amaranthus viridis</i>	Amaranthaceae	Greenamaranth	Thandukeerai	A decoction of the entire plant is used to stop dysentery and inflammations and also to purify the blood.
3	<i>Amaranthus tricolor</i>	Amaranthaceae	Chinese spinach	Sigapputhandukeerai	The roots of red spinach are used as a remedy for dysentery. It is highly recommended for consumption by patients with colon cancer, diabetes mellitus, high blood cholesterol
4	<i>Spinacia oleracea</i>	Amaranthaceae	Spinach	Palakkeerai	It can help support immune function, aid the digestive system, may even have anticancer properties.
5	<i>Alternanthera sessilis</i>	Amaranthaceae	Sessile joyweed	Ponnangannikeerai	To treat hepatitis, tight chest, bronchitis, asthma and other lung troubles.

(Priyanka, T., et al., 2021)

The land measurement is taken for 22 cents and the total area is 890.12 sq.m and for each variety of greens different plot of land were divided. The primary tillage practice of ploughing has been undergone 2 times with rotavator for the fine tilth of soil along with 250 kg of FYM and plots were divided for sowing. All spinach is direct seeded except for sessile joy weed which is planted using cuttings and for all other greens broadcasting of seeds in 1:10 ratio of seeds and sand was mixed. The sessile joy weed cuttings were planted with a spacing of 12 x 15 cm. After sowing and plantation immediate life irrigation was given and then irrigation was done in weekly intervals. Since spinach's roots are comparatively shallow, it benefits from frequent, brief irrigations that keep the soil consistently moist for optimal leaf formation. Nonetheless, it's important to avoid overwatering spinach because it might become overly saturated, especially in areas with dense soil.

**Table 2. Details on selected greens seed rate, duration and harvesting time**

S. No.	Particulars	Indianspinach	Greenamaranth	Chinesespinach	Spinach	Sessilejoyweed
1	Scientificname	<i>Amaranthus dubius</i>	<i>Amaranthusviridis</i>	<i>Amaranthustricolor</i>	<i>Spinacaoleraca</i>	<i>Alternantherasessilis</i>
2	Seedrate	50g	50g	50g	50g	80cuttings
3	Propagation	Seed	Seed	Seed	Seed	Cuttings
4	Harvest	25-30DAS	20-45DAS	30DAS	45DAS	35-40DAS

(Waseem.,etal.,2001)

### Harvestingandhandling

Selected5varietiesofgreenshavebeenharvestedindifferentintervalsotime.

Theplantismanually chopped off just below the crown, knotted into bunches of eight to twelve, and packed twenty-fourof these bunches or a minimum of twenty per gunny bag. These bags are weighed and are marketed in localretail shops. Harvesting in proper interval of time is very important because if the harvesting gets delayed itmayresult in flowering and which leads to yield loss.Longer growing seasons are given to spinach, resulting in noticeably larger and thicker leaves. After a field has been trimmed, the plants grow again and may be harvested a second or thirddtime.

**Table 3. Cost of Cultivation of selected greens**

S. No.	Particulars	Unit	Quantity	Rates (Rs.)	Amount (Rs.)
1	Seed	Rs./Kg	50g	250	750/-
2	Landpreparation	Rs./hr	1hr	1000/-	1000/-
3	Basalapplication (FYM)	Rs./Kg	50kg	10/-	500/-
4	Sowingand Transplantation charge	Rs.	5Labours	200/-	1000/-
5	Fertilizer(Urea)	Rs./Kg	13kg	242/-	242/-
YIELD					
7	Indianspinach	Rs./Kg	100	15	1,500/-
8	Greenamaranth	Rs./kg	100	15	1,500/-
9	Chinesespinach	Rs.	120	15	1,800/-
10	Spinach	Rs.	150	15	2,250/-
11	Sessilejoyweed	Rs./Kg	100	15	1,500/-
	Totalyield	Rs./Kg	570	-	8,550/-
	<b>Costofcultivation</b>	-	-	-	<b>3,492/-</b>
	<b>Grossincome</b>	-	-	-	<b>8,550/-</b>
	<b>Netincome</b>	-	-	-	<b>5,058/-</b>

That the gross returns obtained in 22 cent was Rs.8,550/- based on yield of good quality marketableleaves. With respect to net returns, it was Rs.3,492/-. Thus, cultivation of green leafy vegetables in the studyarea was found to be profitable as revealed by the net returns. The analysis of

returns and cost were used to compute the benefit cost ratio and it resulted into a profitable benefit cost ratio in respect of all the greens. The magnitude of B:C ratio was 1:1.44 there by indicated higher returns for every rupee invested in the greens production in the study area. The average yield is 570kg and the gross income is Rs.8,550/- for the total area of 22cents. This study reveals that low amount of investment is convenient for a good amount of profit in less than 1acre of land.

**Table4. Cost and Returns of Greens**

S.No.	PARTICULARS	Unit (Rs)
1	Cost of cultivation	3,492/-
2	Average yield	570kg
3	Gross returns	8,550/-
4	Net returns	3,492/-
Benefit cost ratio		1.44

Greens offer notable socioeconomic advantages, particularly in tropical and subtropical areas where women predominantly cultivate and harvest green leafy vegetables to boost household income. In rural regions, traditional leafy vegetables serve as a vital source of nutrition, being available year-round and offering an affordable supply of vitamins and micronutrients to address deficiencies. These vegetables also provide a variety of phytochemicals like rutin and is quercitrin, which have substantial applications in daily diets and industries, as well as the medical field.

## CONCLUSION

Greens hold significant potential as a sustainable crop that can enhance household food security and boost farmers' income. In arid areas where commercial crops like maize, beans and rice struggle to grow, greens cultivation can play a key role in achieving the first Millennium Development Goal of reducing hunger and poverty. Thus, greens cultivation presents a promising avenue for supporting economic development and food sustainability. The total yield is 570kg and the total income is Rs.8,550/-, the benefit cost ratio is 1:1.44 since the BC ratio is greater than 1 the production is considered to be beneficial and profitable.

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