



## THE IMPACT OF GREEN REVOLUTION ON GROWTH RATE OF FINGER MILLETS IN INDIA

**R. Sunandhini**

*Assistant Professor (Agrl. Economics), Imayam Institute of Agriculture and Technology (Affiliated to Tamil Nadu Agricultural University) Thuraiyur, Thiruchirappalli – 621206  
E-mail: [suna.agecon@gmail.com](mailto:suna.agecon@gmail.com)*

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**Abstract:** The present study was carried out to estimate the growth rate of area to measure the contribution of different components to the growth rate of finger millet in India during the last six decades i.e. from 1950-51 to 2011-17. Area under finger millet registered positive growth during 1950-51 to 1980-81 and negative growth subsequently. This is due to Green Revolution which was initiated in 1960s by introducing high yielding varieties of rice and wheat to increase food production in order to alleviate hunger and poverty. The production of wheat and rice increased due to the government initiatives after Green Revolution which created an impact on the production of indigenous millet.

**Key words:** Finger Millet, Green Revolution, Trend, CAGR

### INTRODUCTION

Millets are important cereals which play a significant role in the food and nutrition security of developing countries in the semi-arid tropics of Asia and Africa, especially in India, Nigeria and Niger. They are grown on soils which typically are too poor to support any other crop. They have a higher tolerance for drought, low nutrient application, and fluctuations in temperature than other cereal crops and also unique due to their short growing season. They can withstand higher temperatures, making them the perfect choice as 'climate-smart' cereals. As against the requirement of 5,000 litres of water to grow one kilogram of rice, millets need hardly 250-300 litres. As urban consumers cope with a range of lifestyle-related disorders, these grains are gradually gaining in popularity. Millets are grown in about 21 States. There is a major impetus in Karnataka, Andhra Pradesh, Tamil Nadu, Kerala, Telangana, Uttarakhand, Jharkhand, Madhya

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Pradesh and Haryana. In 2016-17, the area under millets stood at 14.72 million hectares, down from 37 million ha in 1965-66, prior to the pre-Green Revolution era. Important millet crops grown in India are Sorghum (Great millet), Bajra (Pearl millet), Ragi (Finger millet) and small millets *viz.*, Korra (Foxtail millet), Little millet, Kodo millet, Proso millet and Barnyard millet. These are often referred to as coarse cereals, but realizing the nutrient richness of the grains they are now considered as nutriceals. Millets are rich in minerals like iron, magnesium, phosphorous and potassium. Finger millet is the richest in calcium content, about 10 times that of rice or wheat. In this fashion, nutrient to nutrient, every single millet is extraordinarily superior to rice and wheat and therefore is the solution for the malnutrition that affects a vast majority of the Indian population.

In India, millets are cultivated in an area of 15.48 million hectare producing 17.2 million tonnes with a yield of 1111 kg/ha (Directorate of Economics and Statistics, 2015). Maharashtra, Rajasthan and Karnataka are the top most states of millets cultivation in India. Contribution of millets in total foodgrain production of India reduced from 22.17 % to 6.94 % over the last six decades from 1950-51 to 2011-12. In spite of all the extraordinary qualities and capacities of millet farming systems, the area under millet production has been shrinking over the last five decades and rapidly, since the Green Revolution period due to relentless promotion of other crops such as rice and wheat for intensive farming in select few resource rich areas under irrigated conditions (MINI). Another major threat that millets facing in the country in the form of an unnatural promotion of maize, which is resulting in maize invasion in various parts of the country owing to the corporate-induced demand for bio-fuels and poultry feed (Michaelraj and Shanmugam, 2013).

### **Green Revolution**

The word "Green Revolution" was coined by William S. Gaud of United States Agency for International Development (USAID) in 1968. Many high-yielding varieties (HYVs) were introduced as part of the Green Revolution into increase agricultural productivity. The programs such as Grow More Food campaign, Intensive Agriculture Development Programme and Intensive Agriculture Area Programme were implemented to improve sector and to increase the cereal grain production during 1947-60. These policies could not meet out the requisite of demand and tonnes of food grains were imported and agriculture was on the brink of collapse. "Green Revolution" was pre-eminent to prevent famine and food scarcity in the agricultural sector. The improvement programs in wheat, paddy, maize was initiated by Indian Council of Agricultural Research (ICAR) at Indian

Agricultural Research Institute (IRRI) to release High Yielding Varieties (HYV). This has led to enormous production in the last 40 years. Accordingly, the global production of cereals increased by 174% between 1950 and 1990 while the global population increased by 110%. The increased production of cereals enabled the nations to feed their growing population and averting the Malthusian scenario predicted in the 1960s. The major ecological and societal impacts of the Green Revolution can be summarized as follows: (1) loss of landraces that were indigenous to our country, (2) the loss of soil nutrients making it unproductive, (3) excessive use of pesticides increases the presence of its residues in foods and environment (4) the farmers shift to unsustainable practices to obtain more yield, (5) increased rates of suicide among farmers, (6) unable to withstand the increasing expenses for farming and debts small farmers sold their lands to large commercial farmers, and (7) unable to withstand the food inflation and economic crisis the farmers left farming resorting to other occupation.

## 2. METHODOLOGY

The study was based on the secondary data. The secondary data on area of Finger Millet was collected for the years 1988 to 2017. The data was collected from the Food and Agricultural Organization. Keeping in view the objectives the following analytical techniques were employed in the present study.

### 2.1. Trend analysis

The trend in area of finger millet was computed for the series data of 1985-86 to 2016-17. To trace the path of process liner parametric trend model as given below is used.

$$Y = b_0 + b_1t$$

#### 2.1.1. Growth rate analysis

The growth rates were used to measure the past performance of the economic variables. Compound growth rate was analysed by using exponential growth function as given below

$$Y = ab^t$$

Where, Y=Area/Production/Productivity; t=Time variable; b = Regression coefficient; a=Intercept

The compound growth rates 'r' was computed by using the formula

$$CGR (r) = [\text{Antilog} (\log b) - 1] * 100$$

Where, r = Compound growth rate

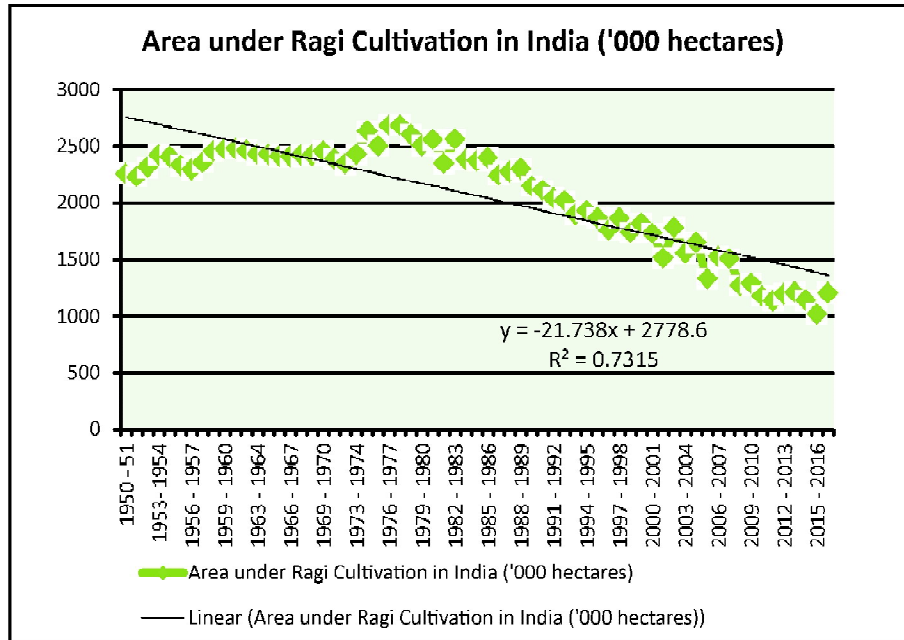


Figure 1: Trend Analysis of Area under Finger Millet in India (1950 – 2017)

### 3. RESULTS AND DISCUSSIONS

The trend analysis was fitted into a linear equation and assessed. It could be seen that the area under finger millet was in increasing trend till 1980s and then started to decline as in Fig1. The compound growth rate of area was evaluated. The results revealed that annual growth rate of area was negatively significant -16.71 per cent per annum at one per cent level. The results of the study on the trend analysis and annual growth rate have shown the negative and significant values indicating that the area under finger millets has been decreasing drastically.

#### Conclusion

The decline in area under millets was largely due to change in dietary habits (induced by a cultural bias against millets post-Green Revolution), low-yield of millets, and conversion of irrigated area towards rice and wheat. Millet awareness is catching up fast in the urban centres such as Kolkata, Mumbai and Delhi among others. Millets are gluten-free and have a low glycaemic index. Their micro-nutrients composition is also better as compared to rice or wheat. As urban consumers cope with a range of lifestyle-related disorders, these grains are gradually gaining in popularity now-a-days which will have upward trend in the upcoming days.

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