ISBN: 978-93-94570-71-9

10. Challenges of Sustainable Agriculture Development in Tamilnadu

S. Chandran

Research Scholar,
College of Management,
SRMIST, Chennai,
Tamilnadu, India.

Dr. T. Ramachandran

Professor,
College of Management,
SRMIST, Chennai,
Tamilnadu, India.

Abstract:

The goal of this study is to look into Tamilnadu Sustainable Agriculture Challenges. The contribution of the agriculture sector to the Gross Domestic Product and economic position of Tamilnadu may be noticed. This industry also contributes greatly to the country's long-term economic development. Any country's long-term agricultural success is dependent on a well-balanced use of its natural resources. Agriculture is the backbone of the Indian economy, despite rapid expansion in other sectors. This research seeks to investigate the question of agriculture's long-term sustainability in Tamilnadu. It also tries to compare the sustainable agriculture system in practice to the traditional and intensive agriculture systems in terms of ecological, economic, and social sustainability. It aims to provide long-term answers to the system's difficulties in order to encourage and practice sustainable behaviors. The study's findings indicate creative techniques for reaching growth.

Keyword*: Sustainable growth, Resources, Development, trends, Farmers economic status.*

10.1 Introduction:

The contribution of the agriculture industry to GDP (Gross Domestic Product) and employment in the Indian economy demonstrates its importance. This industry also contributes greatly to the country's long-term economic development. The sustainable agriculture development of any country depends upon the judicious mix of their available natural resources. In Tamil Nadu, two-thirds of the population lives in rural areas, and almost 90% of the population relies on agriculture-related jobs. Normal farming procedures were used in the Tamilnadu agriculture sector for the past four decades, yet the yield for the outputs was sufficient for the farmers' economic situation. However, present farmer situations make agriculture techniques unviable due to a lack of awareness about marketing channels among farmers. At the same time, the farmers' economic situation is unsustainable. The majority of farmers are uninterested in agriculture cultivation due to a lack of funds to

acquire fertilizers and begin the cultivation process. As a result, the vast majority of farmers intend to change careers. This condition should be continued depending on the findings. In Tamilnadu, there are unquestionably vast stretches of undeveloped land. When problems are resolved, a few agriculture scientists are chosen to advise farmers on how to proceed.

There are two strategies to boost productivity. To begin, increase output by making efficient use of available resources. Second, by varying input, you can increase output. In terms of productivity and long-term viability, the first option is superior. However, due to rising population, this strategy will not be able to give a long-term answer. As a result, we can opt for the second alternative, which has the potential to degrade the economy's environmental sustainability.

The main aim of any agricultural program must be to maintain sustainable growth in agricultural production for ensuring food security to the growing population and also to generate adequate surplus for exports. This seems like a daunting challenge to many. But it is feasible. The overarching motive for this report is to encourage people to act, despite the enormous challenges, or as John F. Kennedy said: "By defining our goal more clearly, by making it seem more manageable and less remote, we can help all people to see it, to draw hope from it, and to move irresistibly towards it.

Sustainable agricultural development seeks not only to preserve and maintain natural resources, but also to develop them because future generations would have much more demand for agricultural and food products both quantity-wise and quality-wise. It is predicted that by 2050, the world will have nine billion mouths to feed. The real challenges will be facing drought, floods and changing rainfall patterns, and dishing up enough servings to meet growing demand. India, the emerging economic superpower, paradoxically tops the global hunger chart with more than 27% of the world's undernourished population.

Agriculture occupies the most important position in Indian economy. The role of agricultural sector in Indian economy can be seen during its contribution to GDP (Gross domestic Product) and employment. In the state of Goa agriculture is one of the most important economic activities. However even though one fourth of the population is sustained by agriculture in Goa, it contributes to only 15-16% to the income of the state. Due to rapid urbanization the availability of agricultural land is reducing

10.2 Agriculture and Sustainable Development:

Agriculture plays important roles in sustainable development and in hunger and poverty eradication. The challenges faced by agriculture in sustainable development lies in working out ways of bringing about a society that is materially sufficient, socially equitable, and ecologically sustainable and one that is not obsessed by growth only, but motivated by satisfying human needs and equity in resource allocation and use. Primarily sustainable agriculture needs to protect the natural resource base. It should prevent the degradation of soil and water; conserve biodiversity; contribute to the economic and social well-being of all; ensure a safe and high-quality supply of agricultural products; and safeguard the livelihood and well-being of agricultural workers and their families. The main tools towards sustainable agriculture therefore are policy and agrarian reform, participation, income

diversification, land conservation and improved management of inputs. This policy framework could be an effort to identify the strategies, guidelines and practices that constitute the Indian concept of sustainable agriculture. This has to be done in order to clarify the research agenda and priorities thereof, as well as to suggest practical steps that may be appropriate for moving towards sustainable agriculture. Some tend to confuse sustainable agriculture with organic farming. But both are very different form each other. Organic farming is essentially a soil-building mechanism; to keep the soil 'alive', make the soil 'live' and sustain fertility. Building 'live' soil is the primary concern of all organic farming. In organic farming, soil - and not the crop - is fed. Sustainable agriculture means not only the withdrawal of synthetic chemicals, hybrid-genetically modified seeds and heavy agricultural implements (as in organic farming); it also tries to simulate the conditions found in nature. If this is followed then there is no reason why agriculture cannot be an economically viable activity in addition to being environmentally sustainable.

10.2.1 Air pollution, Ecosystems and Biodiversity:

Ecosystems are impacted by air pollution, particularly Sulphur and nitrogen emissions, and ground-level ozone as it affects their ability to function and grow. Emissions of both Sulphur dioxide and nitrogen oxides deposit in water, on vegetation and on soils as "acid rain", thereby increasing their acidity with adverse effects on flora and fauna. Ultimately, acidification affects the ability of ecosystems to provide "ecosystem services", such as for example nutrient cycling and carbon cycling, but also water provision, on which the planet and human life is dependent.

Increased ground-level ozone also causes damage to cell membranes on plants inhibiting key processes required for their growth and development. The loss of plant cover affects us all. Trees and other vegetation absorb pollutants such as excessive nitrogen dioxide, ozone and particulate matter, through their leaves and needles and thereby help to improve air quality. Less plant cover thus means less filtering capacity to clean our air. Eutrophication, the process of accumulation of nutrients, including nitrogen, in water bodies, often results from air pollution. Nutrient overloads in aquatic ecosystems can cause algae blooms and ultimately a loss of oxygen, and of life. As ecosystems are impacted, so is the biological diversity.

Land use Pattern:

Over-exploitation of land causes erosion, landslides, and flooding clogs irrigation channels and reduces the arability of the land. Sustainable agriculture avoids these problems by improving productivity, conserving the soil etc.

Climate:

Conventional agriculture contributes to the production of greenhouse gases in various ways like reducing the amount of carbon stored in the soil and in vegetation, through the production of Methane in irrigated field and production of artificial fertilizers etc. By adopting sustainable agriculture system, one can easily overcome this problem.

10.2.2 Ecological Sustainability:

Sustainable agriculture **gives equal weight to environmental, social, and economic concerns in agriculture**. Agricultural sustainability rests on the principle that we must meet the needs of the present without compromising the ability of future generations to meet their own needs.

Traditional production systems, intensive agriculture systems, and sustainable agriculture systems are three basic categories of farming systems that can be examined in terms of sustainable development. We can also compare them on three different levels: ecological, economic, and social sustainability.

Soil fertility decline:

Soil fertility decline occurs when the quantities of nutrients removed from the soil in harvested products exceed the quantities of nutrients being applied. In this situation, the nutrient requirements of the crop are met from soil reserves until these reserves cannot meet crop demands. This results in a reduction of plant growth and yield.

Contributing factors:

Nutrients may be removed from the soil by:

- Growing crops
- Soil erosion
- Leaching.

Nitrogen can also be lost from the soil as a gas by the process of denitrification. Organic matter plays a key role in maintaining soil fertility. It holds nitrogen and sulfur in organic forms and other essential nutrients such as potassium and calcium.

The loss of organic matter mainly occurs through continuous cropping with stubble removal or burning, and is accelerated by frequent tillage. In all agricultural systems, nutrients are removed over time in harvested products, such as grain. Off-site losses of nutrients can also occur through soil erosion, runoff, leaching and burning of crop residues.

Fertilizer use:

The usual management response to nutrient removal or loss is to apply fertilizer. Significant areas of cultivated land in Queensland are now unable to produce economic crop yields and high protein grains without the use of fertilizers.

Nutrient stratification:

In some rain-fed cropping systems such as grains, minimum/zero tillage with stubble retention has resulted in nutrient stratification (particularly phosphorus and potassium) in the surface soil (0–10cm).

Subsoil depletion:

Limited in-season rainfall often causes crops to meet their water (and nutrient) requirements from the subsoil. This has resulted in subsoil depletion of nutrients even though the surface soil may have adequate levels due to redistribution via crop residues.

10.2.3 Economic Sustainability:

Agriculture must really be economically viable in the long run to be sustainable. In the long term, conventional agriculture poses a large economic risk than sustainable agriculture. Governments are sometimes prone to prioritizing export-oriented production systems over domestic demand supply. This is not really correct. Focusing entirely on exports has hidden costs: transportation, ensuring local food security, and so on. Domestic demand, particularly food security, should be treated as equally essential as the visible balance of trade by policies.

It's a common misunderstanding that certain commodities ensure substantial economic returns. However, because markets are volatile and alter frequently, market production entails some risk. Cheap foreign food may flood the domestic market, leaving Indian farmers stranded. The Indian government is under pressure as a World Trade Organization signatory to liberalize and open its economy to the global market so that it can no longer shelter its farmers behind tariff walls.

Farming is the primary source of employment for rural residents. Specialization and mechanization may boost "efficiency" in a narrow sense, but they reduce employment on the land. When developing national agricultural assistance programs, the welfare costs of unemployment must be considered. Sustainable agriculture, which focuses on small-scale, labor-intensive activities, aids in the solution of these issues. Economic sustainability is an integrated part of sustainability and means that we must use, safeguard and sustain resources (human and material) to create long-term sustainable values by optimal use, recovery and recycling.

The average Indian farm family works 80 hours per week, and earns about $3000.00 in a year. His wife and children work with him in the field, whereas an American farmer earns $60000.00 in a year working 80 hours per week. At the firm level, economic sustainability means that **a** farm is managed in a way that ensures its long-term profitability. To be economically sustainable, a farm does not have to make profit every year.

10.2.4 Social sustainability:

Social sustainability is big challenges in Tamilnadu farmers. Because of even big and medium farmers cannot suffers, its can affected small land holding farmers. Its large land holding farmers can easily know the markets position then we can sell the products in markets. At same export products are easily influence the local markets. Many new technologies fail to become applicable in agriculture sector due to lack of acceptability by the local society. Farmers can divides more number based religious, caste, economic status, highest land holding status.

Recent farmers are ready to do the cultivation but sufficient labor forces are not ready, agricultural labors more numbers migrate some other industry, because all the days in a month not possible to assign work in agricultural labors. So agricultural labors are easily switch over some other jobs. So, farmers not possible for work force.

10.3 Tamilnadu Agriculture Sector:

Tamil Nadu agriculture is the most overriding sector in the economy of the state. Around 70 percent of the state's population is involved in agricultural activities as this is one of the major means of livelihood in Tamil Nadu. Tamil Nadu has occupied an area of 1.3 lakh sq. km with an overall area of around 63 L.

The total geographical area of Tamil Nadu is one crore 30 lakhs and 33 thousand hectares. Out of this only **one third** of land is used for agriculture (45, 44,000 hectare). 17% of the land is used for non-agricultural use. Nearly the same size (2125 thousand hectares) of land are forests.

The major crops sown in Tamil Nadu are **rice, jowar, ragi, bajra, maize, and pulses**. Few other crops that are highly cultivated in the regions of Tamil Nadu are cotton, sugarcane, tea, coffee, and coconut. Tamil Nadu has also gained a commendable status is the horticultural sector in its agricultural department. India is a vast country with variety of landforms, climate, geology, physiography, and vegetation. India is endowed with regional diversities for its uneven economic and agriculture development because of

- Agro-Climate Environment.
- Agro-Ecological Regions.
- Agro-Edaphic regions.
- Natural resource Development.
- Human Resource Development.
- Level of Investment.
- Technological Development.

10.4 Addressing Environmental Issues (Planet):

The availability and optimal utilization of land, water and biodiversity are central to development, food security and poverty reduction. The sustainable utilization of the natural resources is regarded as a prerequisite for development and needs to form the basis for policy interventions for people and area development. 8.2.1 Management of Soil Resources Effective soil management is needed to minimize and reverse significant soil structural degradation, as well as salinity or acidity problems that exist in many parts of India. It is also important to enhance the production capacity of soil by addressing the decline in soil organic matter through the promotion of conservation tillage practices, and combating nutrient depletion through appropriate inputs, best practice cultivation, and on farm training. Strategies: o Encourage implementation of land management plans that are based on sustainable use of renewable resources and on integrated assessments of socio-economic, infrastructural and environmental potential; o Develop and promote an integrated approach in land use planning and management to maintain the integrity of ecosystems; o Promote

the principles of ecological agriculture to help conserve ecological processes that support life by recycling essential elements, cleansing water, regenerating soils, etc.; o Ensure effective and efficient use of soil fertility improvement practices with minimal or no damage to the environment; Promote conservation tillage practices to address the decline in soil organic matter;

10.5 Suggestions:

The "farm Problem" of India is a huge mountain, but it is surmountable. To address the challenges just presented, a number of attempts have been made by various actors to define objectives or priority areas for action. These broadly include the following:

Increase agricultural productivity, close yield gaps, achieve maximum sustainable yield in farms and fisheries, and improve efficiency of resource use – e.g. more crop per kg of nutrients, more crop per drop of water, more crop per unit of energy, higher productivity per unit labour.

Reduce the workforce dependent on agriculture for the sake of increased incomes for agricultural households and decent, diversified rural employment opportunities. Nurture - healthy, sustainable and productive ecosystems and support integrated evidence-based planning and management of land and natural resources to reduce deforestation, land degradation, biodiversity loss, and the carbon footprint of agriculture and food systems.

Increase supply, nutritional value and safety, availability- and distribution of- food through support to diversified, gender and nutrition sensitive, human rights based. Increase value addition of primary- commodities and develop inclusive agri-food value chains, which reduce post-harvest losses and waste and ensure that agricultural commodity prices reflect social and environmental costs.

10.6 Conclusion:

The conditions for development of sustainable agriculture are becoming more and more favorable. New opportunities are opening the eyes of farmers, development workers; researchers and policy makers like agree related businesses, dairy farming, poultry farming castle farming and fisheries. Most farmers are open-minded for agribusiness and to be connected to the value chain of farm to fork. Government's recent initiatives like direct benefit transfer to the farmer-buyer are laudable. The Indian agricultural sector is facing a crisis.

Free trade has not been free from problems. Farming and farming community are waiting for a fair treatment even as many of them have lost interest or lives. The whole world knows what Indian farmers desired, deserved and derived from globalization. There can be no better time than now – the period of second-generation reforms – for a critical study of this vital sector of the Indian economy and for ensuring a second green revolution in the near future. A long-term vision is needed for inclusive growth of farming and farmers. We must develop Indian agriculture into a vibrant sector contributing substantially to the growth of New Age Indian economy and for its sustainable development.

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