

Inappropriate Cropping System: The Root Cause of the Poverty of Farmers in Shevgaon Tehsil of Ahmednagar District, Maharashtra.

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Abstract:

Agriculture has been practised in human society for 10,000 years. In order to ensure that there is sufficient food production to suit the needs of the human population, farmers have been pushed to utilise "modernised" agricultural practises. All of these advancements are intended to produce crops that are more resilient to environmental hazards, larger, mature more quickly, and are profitable. We are now able to produce more on a given piece of land in less time because to the modern methods.

Farmers in the study region, which is largely semi-arid, have recently adopted income crops like sorghum and millet due to the lack of land and water for cotton and onions. How farmers should implement their agricultural strategy in light of the local terrain is the main focus of the current study. Basically, effective cropping, low cost of production and organic agriculture system are the major options if one wants to better their financial situation.

According to analysis, we should choose 30% cash crops, 20% food grains, 20% pulses, 20% oilseed crops, and 10% fodder crops based on climatic condition and water availability. By maintaining their area-wise ratio, we can lower production costs and prevent the oversaturation of one crop in a significant area.

Key Words: *Inappropriate, poverty, Crop concentration, Crop Diversification, Profitability, Raising risk, Risk mitigation.*

Introduction:

In the agricultural nation of India, according to our elders, there was once gold smoke. If anything is to blame for the high number of farmer suicides in this same agricultural country, it is the farmers' improper cropping techniques. You inquire what the best cropping method is. The correct climatic cropping system, which differs in each climatic zone, is the solution, and it was on the basis of this system that our forefathers made agricultural advancements. The widespread use of chemical fertilisers for higher productivity, new experiments in challenging climate areas, and farmers' embrace of new technologies in their ambition to get wealthy rapidly are the main causes of farmers' poverty in today's dynamic world.

Today, the financial stability of farmers has been destroyed by rising human requirements, rising input demand, unspectacular cropping practises, and rising production costs. The cropping pattern in India is influenced by a variety of factors, including rainfall, climate, temperature, soil type, technology, and the socioeconomic status of the farmers. Although equipment and technology are not as readily available as we may think, growing modernization was primarily responsible for these crop pattern changes.

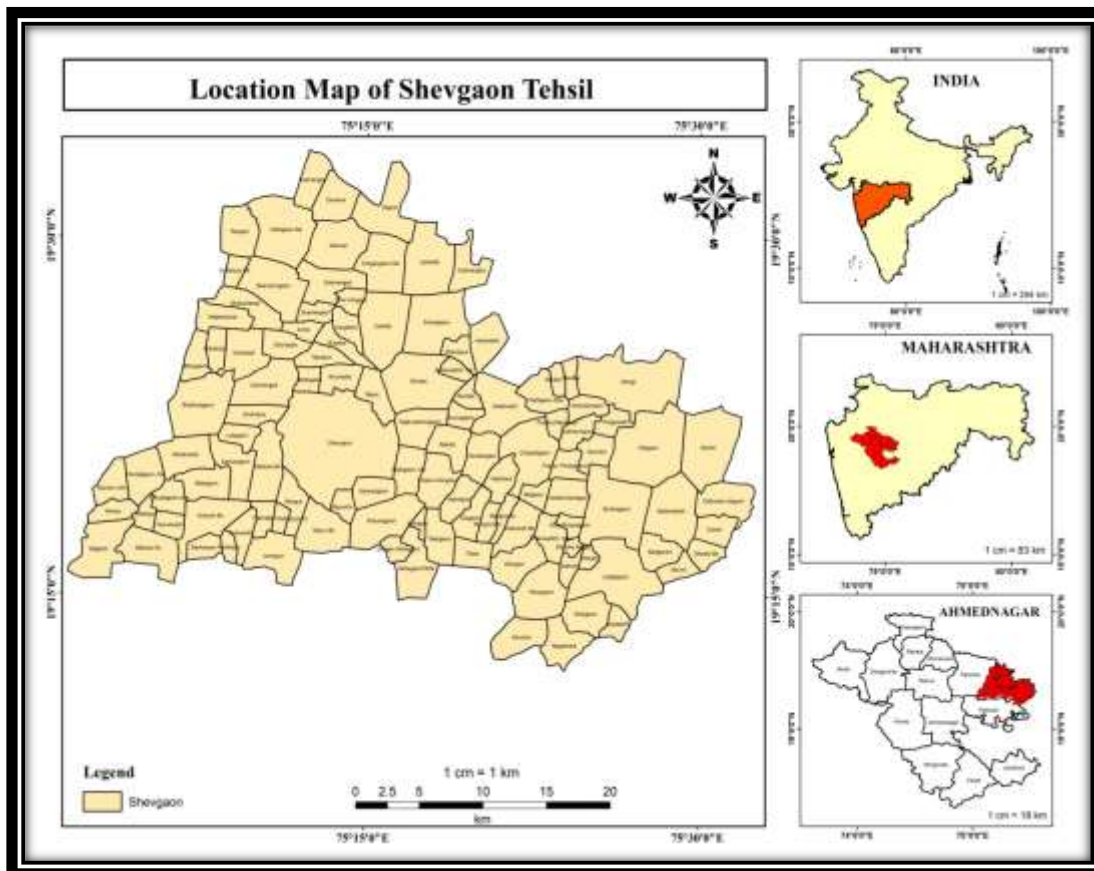
As a result of globalisation, farming methods have altered, and farmers now place a greater emphasis on commercial crops. As a result, farmers in arid climates start employing new farming methods, and the productivity of the land increases. All of these factors result in high production costs, low productivity, and a debt-ridden agricultural sector. Shevgaon Tehsil largely consists of a geographical region with a climate that is favourable for the cultivation of sorghum and millet crops, recent land and water availability for a cash crop, and an acceptable cropping method for cotton and onions. The failures of a single cash crop management approach, however, to control pest's drives up the cost of insecticide application and reduce net profit.

The main topic of the current study is how farmers should carry out their agricultural plans in light of the regional topography. Basically, the main possibilities if one wishes to improve their economic position are low costs of production, efficient cropping, and an organic agriculture system. If nothing changes soon, farming and farmers may soon become extinct as a result of escalating production costs. According to the literature review and present study emphasis, you must select cash crops, food grains, pulses, oilseed crops, and fodder crops depending on climate and water availability and compute their area-wise ratio.

Selection of Area;

Why, despite having access to both fresh and existing resources, is the region, which has profited from traditional farming for thirty years, lagging behind in terms of economic development? The core issue still exists, notwithstanding political adjustments made in the name of a development strategy. Why, despite the use of chemical fertilisers increasing over the previous ten years has production not increased? Why do most new business endeavours fail? What is the current state of the interim period plan? Why does a farmer with a limited education who is desperate for money reject the fundamental principles of the Department of Agriculture and Meteorology? The Shevgaon Tehsil has been chosen for investigation in order to find out the answers to these and other issues.

Shevgaon Tahsil may be found in the southern part of the district between 19°13'18" and 19°33'57" North Latitude and between 75°01'48" and 75°32'44" East Longitude. There are 112 villages in the tahsil as a whole. Tahsil has a total size of 1031.85 sq. km. 913.19 sq km (88.5%) of the area is used for agriculture, 11.57 sq km (1.12%) for forest, and 107.09 sq km (10.38%) for other purposes. The Shevgaon tahsil receives 501.7 mm of rainfall on average.



Objectives:

1. To study the present status of the agriculture setup in the study area.
2. To suggest ways and means to change the agricultural bias with farmers by adopting a sustainable approach.

Methodology:

- A. **Crop concentration (Bhatia's method):** The fluctuations in any crop's density in a certain area or region at any particular period are referred to as crop concentration. The concentration of a crop in a location is significantly influenced by its topography, climate, humidity, and soil properties (Bhatia, 1965). Every culture has a preferred, maximum, and lowest temperature range. Planners and geographers can better understand the areas of speciality of different crops growing in a place at a certain time by using the location quotient technique to delineate crop concentration.

Crop Concentration Index is calculated as $(a/b) / (A/B)$

- 'a' represents the n crop's area in the component area unit,
- 'b' represents the total area of the crops in the component area;

- A is the total area under crop 'a' in the area,
- B is the total area covered by crops in the area.

This approach states that high index values indicate higher levels of crop concentration and low index values indicate lower levels of crop concentration.

B. Crop Diversification Index:

Crop diversification is fundamentally related to agricultural land use planning. Farmers attempt to plant more than one crop on their farm during a farming year all over the world, especially in developing nations (Husain 1996). Gibbs and Martin's Diversification Index, which offers a valuable alternative index to quantify the degree of diversification in the cropping pattern in an area, is used in India to track Crop Diversity Index with reference to district-wise circles (Gangai, 2011).

$$\text{Crop Diversification Index (CDI)} = 1 - \frac{\sum x^2}{(\sum x)^2}$$

In this case, the crop's share of the overall cropped area is shown by the letter "x."

Crop diversification, according to this method, ranges from 0.1 to 0.9. In general, higher index values mean greater diversification and lower index values mean less diversification. If the index approached 1, it would indicate greater diversification.

Concept:

When it comes to inappropriate cropping systems, poor management practises include using crops that aren't appropriate, mishandling animal feeding operations, overgrazing, ploughing, fertiliser, and using pesticides improperly, excessively, or at the wrong time. Ineffective farming techniques cause soil and water pollution. The natural composition of nutrients in the soil has been altered by the increased use of chemicals like pesticides and fertilisers. Most farmers today use these products excessively. Soil erosion is caused by humans using improper farming techniques. This causes soil erosion by creating channels for water to move quickly through.

Over the past 20 years, commercial crops have mostly replaced traditional mixed farming, favoring monoculture in study area. This monogamous system leads to an increase in insect activity, which causes a number of economic issues. Rotations also help to create a more sustainable production system and lower financial risk. The range of products produced by crop rotation might lower risk since bad weather or poor market prices are less likely to damage all crops at once. Crop diseases can increase farmers' output costs in a number of ways: Pesticides and Fungicides: Farmers may need to employ pricey pesticides and fungicides to manage the infections. This may result in higher production costs and decreased net profits.

Analysis and Results:

Table No. 1 Crop Concentration Index of Two Decade (2000-2020)

Sr. No.	Crops	Agriculture Year 2000				Agriculture Year 2020			
		Crop Concentration Index				Crop Concentration Index			
		SH	CH	BD	DH	SH	CH	BD	DH
1	Sugarcane	1.07	1.07	0.78	0.92	1.13	1.66	0.67	0.73
2	Cereals Crops	0.90	1.09	1.02	1.02	1.00	0.96	0.92	1.04
3	Cotton	0.80	0.63	1.32	1.04	0.80	0.87	1.33	1.10
4	Fodder Crop	1.33	0.66	1.00	0.66	1.33	0.67	0.33	0.90
5	Onion	1.58	0.75	0.50	0.10	1.54	0.82	0.45	1.09
6	Vegetable	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
7	fruit Crop	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10

* SH- Shevgaon, CH- Chapadgaon, BD- Bodhegaon, DH- Dhorjalgaon

Source: Calculated by Author

Given that it is grown in every block, Table 1 clearly demonstrates that cotton is the most significant crop in Shevgaon Tehsil in the decade of 2000. In the Bodhegaon and Dhorjalgaon block, cotton is present in extremely high concentrations. The vegetable and fodder crop is found in all four blocks and has the lowest concentration, according to the low concentration index. The second-highest onion is discovered in Shevgaon block over the same time period, followed by the cereal crops in Chapadgaon block.

If you look ahead to the decade of 2020 the cotton is again leading crop. The area planted with cotton in 2020 will be the same as it was in 2000, but changes have been made to the areas planted with cereal and sugarcane. The Chapadgaon block has switched from cereal to sugarcane as its primary crop. The second change is in cereal crops, which converted less of their land into income crops.

Table No. 1 Crop Diversification Index of Two Decade (2000-2020)

Sr. No.	Crops	Crop Diversification Index (2000)	Crop Diversification Index (2020)
1	Sugarcane	0.067	0.661
2	Cereal Crops	0.665	0.194
3	Cotton	0.215	0.684
4	Fodder Crops	0.003	0.003
5	Onion	0.049	0.041
6	Vegetable	0.001	0.003
7	fruit Crops	0.001	0.003

Source: Calculated by Author

As seen in Table 2, Cereal crops had a higher crop diversity index value than cotton crops in 2000, which changed to a higher index for sugarcane crops in 2020. In 2000, cereals were the main crop; by 2020, cotton and sugarcane will have taken their place. It finds that, farmers are switching from low value, low producing crops to high value, high yielding crops in order to reap the benefits of agricultural diversification in last 20 year. Thus, crop diversity has a good chance of accomplishing the objectives of dietary security, income growth, food security, employment creation, and the development of sustainable agriculture.

The crop substitution finds to the replacement of cotton crop that is increasingly becoming a monoculture crop or showing signs of specialisation. In this developing region, the aforementioned may be significant, but an unforeseen shift in crop variety can have negative economic and environmental effects. Similar overt changes are seen in the research area, leading to issues such erosion, low yields, pest infestation, and soil texture.

Findings of root Cause for Poverty:

- Mismanagement of water supply:** The management of irrigation water entails meeting the water needs of crops while controlling timing and water application to avoid wasting any water, soil, plant nutrients, or energy. In the research area, flood irrigation is predominating, which leads to water shortages during lean times. Due to this, every last drop of water is lost, the crop is destroyed, and there are significant financial losses.
- Increasing influence of Pest and disease:** Monocultures lack other plant and animal species that limit the spread of disease and manage pests through predation, therefore raising a single crop raises the danger of disease and pest outbreaks. Furthermore, the intensity, development, and geographic distribution of diseases can all be impacted by climate change, as well as the population size, survival rate, and dispersion of pests which lead to increasing cost of production.
- Raising risk and decreasing profitability:** The three biggest risks facing farmers today are seed quality, chemical fertilizer, and climate change. If an unanticipated disaster strikes during harvest, this will reduce profitability.
- Decreased in Employment:** Increased unemployment results from unstable agricultural productivity since it first reduces the demand for agricultural labor and then its supply. Apart from a lack of institutional finance and insufficient public investment in rural development, regular droughts and floods are to blame for the downward trend in employment.
- Raising production costs and unstable Market prize:** The result of each of the aforementioned underlying issues is an increase in production costs and a decrease in market value, both of which are unfavorable to the farmer's financial situation. He puts in a lot of effort, but even after a year, he still does not make enough money to pay the bills. The study indicated that in areas with unfavorable climates and low water supplies, changes in native cropping patterns lead to poor crop selection, which in turn leads to excessive production costs.

Suggestion:

The type of costs that make up the agriculture industry must also be understood because costs can take many different forms. In order to practise sustainable agriculture, less external energy must be used, and renewable energy sources must take its place. It's crucial to cut production costs because doing so can boost earnings and profitability. We must concentrate on the following factors while choosing a proper cropping method in order to solve such issues: 1. is the crop or cropping system appropriate for the local soil, 2. how is the soil's pH and fertility, 3. Do you have a sufficient supply of water, such as tanks, wells, dams, etc. 4. Do you get enough rainfall, 5. Can the designated crops be grown given the rainfall patterns?

1. **Encourage small-scale landowners:** The bulk of rural residents live in these households. Increased output of recent crops may not be sufficient to increase their revenues due to their limited operating base. Therefore, the best way to increase the income of small and marginal farmers is to vary the agricultural system in accordance with the availability of resources.
2. **Control of pests and diseases:** One of the most economical ways to fight pests and disease is through crop diversification, which favors species combinations over monocultures. This strategy has received a lot of attention recently.
3. **Risk mitigation in agriculture:** Expanding locally adapted or introducing novel varieties and related production systems will help resource-poor farmers improve their food security and income generation while also protecting the environment. Appropriate combination of crop is very responsive to climatic and biotic vagaries, particularly in fragile ecosystems.
4. **Employment growth in the agricultural sector:** Numerous studies indicate that there is a significant issue with seasonal unemployment in various parts of our nation, which causes seasonal migration of laborers and farmers to neighboring cities and towns in search of contract job. A good cropping system gives rural households more chances to find full-time work.
5. **Reducing production costs:** Maintaining and increasing profitability depend on maintaining and reducing costs. Cost reduction is a genuine, long-lasting reduction in nature that doesn't compromise quality. Either cost can be decreased or output can be increased. The straightforward solution in this case is to lower the cost of production, which may be achieved by lowering the additional expenses required for agriculture, pesticides, labor, and transportation costs, as well as by implementing some classic and some new ways.

Conclusion:

Taking into account everything mentioned above, it is determined that agriculture is a game of chance. Numerous crises come up out of nowhere, causing situations to be decided at the time of planting and develop at the time of harvest. Adopting a sustainable agricultural strategy is essential for this. Our analysis reveals that the primary issue is the cost of audio production. The timing is threatened by the planting strategy chosen in opposition to the climate and soil texture.

Here are some suggestions we can make to help somewhat with this issue: Based on the climate and water availability, we should plant 30% cash crops, 20% food grains, 20% pulses, 20% oilseed crops, and 10% fodder crops. We can reduce production expenses and avoid the oversaturation of one crop in a sizable area by preserving their area-wise ratio.

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