

## **The Debate on Farm Size and Productivity in Indian Economics**

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### ***Abstract***

In the 1960s statistics about farm size and productivity of farms were collected and studied by world famous Indian economist Dr. A.K. Sen. After these studies Sen reached the conclusion that the relation between farm size and productivity is inverse in India. He pointed out that there is no other source of employment for poor villagers. So they prefer to cultivate their own land which is small in size. When villagers cultivate their own land they put in all their efforts and life into it. But that is not the case with large farms. Large farm owners are rich. They have many other sources of earning. So they appoint outside people to cultivate their own land. These outside people do not cultivate those lands by putting in all their efforts because they will get the wages at the same rate irrespective of the productivity. So Sen suggested that this led to large farms having low productivity and small farms having high productivity in India. Sen's proposition was supported by a group of Indian economists like Professor Dipak Majumdar, Professor A.K. Khusro, Professor C.H. Hanumantha Rao and Professor G.R. Saini. However, soon came the period of green revolution that revolutionized Indian agriculture. Sen, while commenting on the relationship between farm size and productivity assumed that labor is the most important investment in agriculture. But after green revolution technology, HYV seeds, chemical fertilizers and sophisticated machineries started to be used in Indian agriculture. There was a tectonic shift in Indian agriculture. From being labor intensive, it became capital intensive. Thus, Sen's proposition lost its importance and validity.

Today most economists around the world prefer to believe that in Indian agriculture may be there was a time when there was an inverse relation between farm size and productivity, but today there is no such relationship.

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***Key Words:*** Farm size, productivity, small farms, large farms and green revolution.

A.

**B. Introduction:**

It was the 1960s. It was a very critical phase of the Indian economy.

India had gained independence in 1947. In 1950 the Constitution was readied and India for the first time in her history became a sovereign socialist secular democratic republic. At this time the Indian economy had broadly two wings. One was agriculture and the other was industry. Thoughts and plans were being framed by the Government of India to put emphasis on the development of both these two wings.

In the Second Five Year Plan (1956 -61), more emphasis was being given to industrial development. But what is very interesting to note is that it was a very critical phase of the Indian economy because at this time India could not neglect the agriculture sector also. With an ever rising population graph India was forced to take agriculture seriously at this period. It was a massive challenge for the young nation. It was at such a critical juncture that a debate was started among the Indian economists.

Legendary Indian economist and philosopher, Dr. A.K. Sen made a serious effort to study the statistics relating to farm size and productivity of farms in this country. Sen after studying these statistics came up with a unique conclusion. He remarked that as per the data available with the Economic Survey of India, there was an inverse relationship between farm size and productivity. In other words, it can be said that Sen concluded that smaller farms had higher productivity and bigger farms had lower productivity. Sen was not alone who interpreted the available data this way. He had a group of famous Indian economists with him. Dr. Dipak Majumdar, Dr. C.H. Hanumantha Rao, Dr. G.R. Saini and Dr. A.K. Khusro also thought and reached the same conclusion about farm size and productivity. Thus, this debate, in economics which is better known as “The Farm Size and Productivity Debate” gained importance and opened doors for research about Indian agriculture.

**C. Literature Review:**

**a) Gatherings from Policy Research Working Paper of World Bank:**

Sara Savastano and Pasquale L. Scandizzo prepared a paper titled ‘Farm Size and Productivity A “Direct – Inverse – Direct” Relationship’ in June, 2017. Two rounds of Ethiopian Rural Household Survey and including an earlier work on five countries in sub Saharan Africa, the paper reached the conclusions that the relation between farm size and productivity are neither monotonous nor univocal. The researchers found that less productive farmers exhibited an U – shape relation between productivity and farm size while more productive farmers show a U – shape relation that reverses the productivity.

**b) Evidence from Ghana:**

Charles Ackah, Michael Tuffour, Francis Dompae and Fred Dzanku prepared a research paper titled “On the Farm Size and Returns to productivity Relationship: Evidence from Ghana”. This paper takes into consideration the empirical evidence about the inverse relation between farm size and productivity that has been removed by green revolution. Green revolution while erasing the inverse relation between farm size and productivity also erased the superiority of small farms in productivity. Differences arise in empirical studies on the farm size-productivity relationship due to variations in crop, technology and market structures shaping agricultural systems in different countries. This research aimed to study the relation between farm size and productivity in the context of Ghana. Ghana Living Standard Survey Round 6 data, collected from a nationally representative sample of households was used. The said relationship proved positive with respect to all the models, crops and regressions. The study therefore called for three main actions. One, a review in Ghana’s land use for agriculture policy, two, the use of sustained and improved technologies for agriculture and three, a review of the IR debate by considering input use intensity, credit market dynamics and soil quality in Ghana.

**c) Farm Size and Productivity Debate in India: Contributions of Dr. Pranoy Roy**

Pranoy Roy (1980) divided the entire debate into three phases –

**i. Phase 1 (1961 – 67):**

This was the period of theoretical formulation of the debate.

**ii. Phase 2 (1967 -77):**

This was the period of empirical verification of the inverse relation.

**iii. Phase 3 (1978 – 80):**

It was a period of synthesis between empirical results and theoretical formulations.

**D. Analysis & Interpretation:**

An analysis and interpretation of the points raised by the economists involved in the farm size and productivity debate have been summed up in this article. The arguments in favor of small farms having high productivity are as follows:

a. **Engagement of family members led to high productivity in small farms:**

The farm size and productivity debate commenced among the leading Indian economists in the 1960s. At that time India was a developing economy. So nature of agriculture in this country was mostly labor intensive. This factor was considered by Dr. A.K. Sen while reaching conclusions about the relationship between farm size and productivity. Dr. Sen analyzed the available statistics from Farm Management Studies carried out by Government of India (GOI) in different districts and reached the conclusion that due to lack of job opportunities family members of small farm owners engaged themselves in cultivation of the land. As in many cases the land was their family property so the family members were emotionally attached to the land. The agricultural crops grown in these lands were the only source of food crops to them. So they used to cultivate this land with very high levels of sincerity and integrity. This resulted in a high productivity of small farms. But in case of big farms, the owner of the farm was rich. He had many other sources of income. So it was not possible for him to cultivate the land by himself. Instead he used to appoint labors from outside. These labors were mostly professional labors. So they did not have their emotions attached to the land or the farm. They used to work keeping into consideration the monetary benefits only. Hence, their level of sincerity and integrity was lower than those who were cultivating their own land. That is why; big farms had small productivity.

b. **Deeper impact of labor intensive technology:**

India gained freedom in 1947. It was almost after two hundred years of dependence that India gained this freedom. At that time India was a developing economy with very limited access to capital intensive technology in both agriculture and industry. Looking at the robust size of the economy of India today, it is very difficult to understand the condition of the Indian economy from 1947 to the 1960s. In that period India was finding it very difficult to grow food crops to suffice her internal demand.

There were no funds available in Indian agriculture for the purchasing of capital intensive technology. Secondly, usage of capital intensive technology would have indicated that a large section of the Indian population would have become unemployed in the agriculture sector. And, it was also not possible to employ them in some other sector as these human resources were mostly uneducated and unskilled to perform any other activity. Hence, in such a situation India experienced a vicious circle as designed by British economist Professor Nurkse. India was using labor intensive technology, so remained a developing economy.

And, because India was a developing economy she could never collect funds to shift from labor intensive technology to capital intensive technology.

According to Dr. A.K. Sen this had a devastating impact on Indian agriculture. Small farms had a small cultivable land. So labor intensive technology was suitable for them. The laborers could cultivate all the parts of the land properly. Hence productivity was very high in small farms. But in case of big farms that had a big cultivable land the laborers could not make optimum use of it due to fatigue, tiredness, excessive job load etc. This led to low utilization of resources resulting into low productivity in big farms.

**c. Role of irrigation:**

In the 1960s Indian agriculture was not professionally managed. It was an effort of individuals that was the driving force behind it. These individuals did not have other opportunities. So they were forced to carry on with this work.

Due to lack of professionalism and applied research, all aspects of Indian agriculture in this era were suffering from a casual approach. So irrigation which is one of the most significant factors associated with agriculture was also done manually. That is why; in this era irrigation was better in small farms than in big farms. This may have also contributed towards small farms having higher productivity and big farms having lower productivity.

**d. Proposition of Professor Dipak Majumdar:**

Dr. Dipak Majumdar was one of the leading Indian economists of this era. He fully supported Dr. A.K. Sen. In a special number of Economic Weekly he pointed out that to a small farm owner; the farm was the only source of income. So he not only applied more labor but also applied more of other factors of production. That resulted into higher per acre productivity of small farms in India.

Economists were however, not unanimous with the conclusions reached by Dr. A.K. Sen and Dr. Dipak Majumdar. Some of them also spoke against it. The arguments against the proposition of Dr. Sen are as follows:

**a. India's economic development and its impact on agriculture:**

The time when this debate started in the early 1960s India was a nascent nation trying to reach the height of self-sufficiency. At that time the propositions of Dr. A.K. Sen and Dr. Dipak Majumdar may have been true that mostly family members used to work in small farms. Because of their (family members) high levels of dedication and integrity at work small farms had high productivity in

terms of production of food crops per acre of land. But soon the situation started to change.

Green revolution commenced in the mid-1960s. As a result of these volumes of production increased by leaps and bounds in Indian agriculture. This had a direct impact on the Indian economy as a whole. With the help of green revolution, India attained self-sufficiency in food crop production for the first time since independence in 1947. There was a growth in India's national income and GDP. Thus, India was on the path of economic development. This opened new avenues of jobs in many rural areas also. So, family members of small farm owners could find lucrative jobs for themselves. They did not have to depend on the small farm only for their source of income and food crops. Hence, this proposition of Dr. A.K. Sen that family member contributed towards the high productivity of small farms stood tarnished immediately after the commencement of green revolution.

**b. Shift from labor intensive technology to capital intensive technology:**

Green revolution brought in a tectonic change in Indian agriculture. Previously in Indian agriculture the main inputs were land and labor. But in the post green revolution period, India for the first time experienced the wide scale usage of sophisticated machineries like tractors, tillers, threshers, chemical fertilizers and High Yielding Variety (HYV) seeds. Thus, in the pre green revolution period all the activities that were done manually, started to be performed by modern machineries in the post green revolution period. Hence, optimum utilization of resources was ensured. This had a direct impact on irrigation also. Irrigating big farms was no more a problem as this started to be done with advance quality pumps and generator sets.

All these could be done because Indian agriculture saw the introduction of capital intensive technology. Labor intensive technology gradually became forbidden. Thus, the proposition that labor intensive technology was not helping laborers to cultivate the big land in big farms leading to small productivity, stood discarded.

**E. Conclusions & Recommendations:**

Studies were done by many Indian economists to explore the relationship between farm size and productivity and judge the validity of the proposition of Dr. A.K. Sen that small farms had higher productivity. Among the foremost of these economists were Professor Ashok Rudra, Professor A.P. Rao and Professor Krishna Bharadwaj.

Professor Rudra who joined the debate in 1968 clearly stated that the inverse relationship between farm size and productivity may have been true in some parts of the country but it cannot be accepted as a general rule. He pointed out that labor was the most important

factor of production in the 1950s. But the circumstances changed during the period of economic planning of the 1960s. With the wide scale use of HYV seeds, chemical fertilizers and modern machineries, agricultural production was influenced in India. Professor A.P. Rao and Professor Bharadwaj also reached similar conclusions.

However, in the 1980s the two main “rivals” in the debate Dr. A.K. Sen and Professor Rudra framed synthesis of their views that said -

- I. The inverse relation is not a universal phenomenon in Indian agriculture.
- II. In various parts of India this phenomenon is more frequently rejected than accepted.

Today it is believed by economists around the world that there is no relation between farm size and productivity in Indian agriculture. It may have existed at some point of time but it does not exist now.

This also has to be pointed out that a very important question was raised as a result of this debate. If a small sized farm is more economically viable, then the model farm will be small and not large as it is in the developed countries. In India the land area may be limited but there is pressure on land. So the small farm model would be highly acceptable from that viewpoint. But from here arises the question of marketable surplus. As the size of the farm becomes bigger, the volume of marketable surplus becomes bigger. If India had to follow the small farm model then the marketable surplus would have remained small. The question was that could India afford to accept the small farm model which produced a small marketable surplus. Secondly, green revolution disproved the inverse relation between farm size and productivity. But in order to reap the advantages of green revolution a farmer needed to invest a huge amount of fund in HYV seeds, chemical fertilizers and sophisticated machineries. Availing bank finance for application of the above was also not easy for small farms due to lack of securities. So, only big farms could reap the advantages of green revolution. Hence, could Indian agriculture afford to take up the model of small farms and fritter away green revolution? During the phase when this debate was going on, India was a developing economy. So the answer to these questions raised by this debate was in the negative.

The most important conclusion of this debate was that it proved that India could not afford to take up the small farm model. It was time for India to take up the advantages of agricultural research and move towards the big farm model in order to fast the speed of her transformation from a developing economy to a developed economy.

#### **F. Future Scope of Research:**

The farm size and productivity debate revolutionized the study of agriculture in Indian economics. It sparked off the thought process of the Indian economists to think about the factors on which productivity is dependent. Soon after this debate Indian agriculture went

through a gigantic change. Green revolution was introduced in this country. As a result of green revolution productivity of farms of all sizes increased significantly. This made India a self-sufficient nation in food crop production. Thus, grew the importance of Indian agriculture in the global platforms. It is believed by many historians that the farm size and productivity debate had catalyzed the introduction of green revolution in this country. Green revolution was the result of extensive research in Indian agriculture. The background for those research works were set up by this debate.

The farm size and productivity debate also opened doors for further research in the following areas:

- i. Study of factors on which productivity of farms were dependent during and after green revolution.
- ii. Did farm size play any role in deterring productivity during and after green revolution?
- iii. At present is there any relation between farm size and productivity?
- iv. In the landscape of the 1960s if bigger farms had low productivity, then what were the ways to increase their productivity?

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