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SIZE OF FARM AND PRODUCTIVE EFFICIENCY : A REVIEW

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ABSTRACT

For more than a century mainstream economist in both capitalist and socialist countries have confidently and enthusiastically predicted the demise of the small, family farm. Small farms have time and again been labelled as backward, unproductive and inefficient—an obstacle to be overcome in the process of economic development. However, the researchers from different countries during the past two decades have challenge the conventional wisdom about small farms and assert that they are "multi-functional"— more productive, more efficient, and contribute more to economic development than large farms.

INTRODUCTION

Agriculture constitutes a significant sector of India's economy. The share of agriculture in the country‘s GDP constitutes about 18 percent. It is characterized by: a multitude of small scale farmers scattered over wide expanse of land area, with small holding ranging from 0.05 to 3.0 hectares per farm land. The farm size and productivity occupied a prominent position in the agriculture economics literature in late 1960s in India when it was observed that small farms had a higher yield per acre than large farms.

This paper examines the effect of farm size on the productive efficiency of smallholder farms in Indian as well as in global context. In particular, the study seeks to establish the relationship between farm size and three components of productive efficiency, namely technical, scale and allocative efficiency.

IMPORTANCE OF AGRICULTURE

Not only in Indian subcontinent, but the major parts of the globe, agriculture remains at the core of rural livelihoods and has a major influence on livelihood outcomes. Land is one of the most crucial inputs in the agricultural production process of majority of rural households. Thus, factors that reduce the rural households‘ access to land significantly affect agricultural productivity, thereby compromising the household’s livelihood.

WHAT IS AGRICULTURAL ECONOMICS?

Agricultural economics originally applied the principles of economics to the production of crops and livestock — a discipline known as agronomics. Agronomics was a branch of economics that specifically dealt with land usage.

It focused on maximizing the yield of crops while maintaining a good soil ecosystem. The subject matter of agricultural economics has both broadened and deepened in recent years.

WHAT IS SMALL FARM?

Studies have used different ways of defining small farms, such as the value of farm output, total farm assets, the ratio of farm income to total family income, the number of days worked off farm, etc[1].

ECONOMIC EFFICIENCY

Efficiency refers to the relationship between the value of the benefit relative to the costs incurred to obtain the benefit. An outcome is efficient if there is no other outcome that makes someone better off without making someone worse off.[2]

In economics, the term **economic efficiency** refers to the use of resources so as to maximize the production of goods and services.[3] An economic system is said to be *more efficient* than another (in relative terms) if it can provide more goods and services for society without using more resources. In absolute terms, a situation can be called **economically efficient** if:

- No one can be made better off without making someone else worse off (commonly referred to as **Pareto efficiency**).[4]
- No additional output can be obtained without increasing the amount of inputs.
- Production proceeds at the lowest possible per-unit cost.

Allocative efficiency: is achieved when resources are distributed among alternative uses such that the goods and services produces are those most highly valued by consumers. The condition for allocative efficiency is that _price = marginal cost.´ If this price of marginal is higher than the good is likely to be under consumed. When the marginal cost of the good is lower than the price then the good may be underpriced and over-consumed.

Productive efficiency: refers to a firms average total cost of production. It is achieved when the output is achieved at minimum average total cost. The productively efficient output occurs when all the potential scale economies have been utilized (minimum efficient scale).

[1] Gebremedhin and Christy, 1996; Hinson, 1996
[2] http://essay.ua-referat.com/Competition_And_Economic_Efficiency
[3] Sullivan, Arthur; Steven M. Sheffrin (2003). *Economics: Principles in action*. Upper Saddle River, New Jersey 07458: Pearson Prentice Hall. pp. 15. ISBN 0-13-063085-3
[4] Vilfredo Pareto(1896)

FACTORS INFLUENCING UNIT COSTS IN AGRICULTURE

There are various factors which can influence unit costs in agriculture:

1. The size of the farm.
2. The Quality of the land.
3. Management of crop-related activities
4. The contribution of the farm dwelling to output.
5. The impact off-farm employment on output and production costs.

Today's on-going process of liberalization in international agricultural trade—now being taken a step further in the Millennium Round of World Trade Organization (WTO) negotiations— is widely recognized to have dramatically negative effects on small farmers various countries.

This puts the small farm issue—called *The Agrarian Question* by renowned social scientist Karl Kautsky (1906) at the beginning of last century—squarely on the agenda for debate at the beginning of the millennium. If small farms are worth preserving—if indeed a small farm model of rural development makes more sense than does the large-scale, mechanized, chemical intensive, corporate dominated and socially excluding model toward which business-as-usual is carrying us—then now is the time to act.

We must value the multiple functions of farms in the Third World if we are to achieve a sustainable agriculture, according to the Food and Agriculture Organization (FAO) of the United Nations (1999):

"To face the current challenges of agriculture, we need to address agriculture and land in a broader context by integrating multiple roles (economic, food production, nature and land management, employment etc.). Sustainable agriculture and land use is not just a means to obtain more food and income, in socially acceptable ways which do not degrade the environment. Rather, it has an all-encompassing impact on communities, environments, and consumers. We must reach a consensus and common understanding of sustainable land use as an opportunity to improve the quality of the environment, including its physical (increased soil fertility, better quality air and water), biological (healthier and more diverse animal,plant, and human populations), and social, economic and institutional (greater social equity, cohesion, peace/stability, well-being) components…. Land is not just a resource to be exploited, but a crucial vehicle for the achievement of improved socioeconomic, biological and physical environments. Concretely, by paying attention to the multiple functions of agriculture and land use, all economic, social and environmental functions of agriculture, at multiple levels, are recognized and included in decision making in order to promote synergies between these functions and to reconcile different stakeholder objectives."

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ISSUES PERTINENT TO THE 'MEASUREMENT OF PRODUCTIVE EFFICIENCY

Measurement of productive efficiency draws on the seminal work of Farrell (1957) who suggested that the efficiency of a firm consists of two components: technical and allocative efficiency.

Technical efficiency is a measure of the ability of a firm to obtain maximum output from a bundle of inputs given the best available technology. Allocative efficiency, on the other hand, reflects the ability of a firm to use factors in proportions that maximise producer profits or minimize costs, given the prevailing input prices.

Two approaches are generally used to derive estimates of efficiency: parametric and non–parametric methods.[5]

The parametric approach involves specifying and estimating a parametric production function, which can be cost or profit function. On the other hand, the non–parametric approach is a measure directed to frontiers rather than central tendencies. It uses mathematical programming techniques and models to evaluate the performance of ‒best practice farmers‖ in terms of multiple inputs used and multiple outputs produced.

The two approaches have their strengths and weaknesses. While the parametric method provides a basis for hypothesis testing, it is more prone to misspecification error[6]. By contrast, the non–parametric method does not require a priori information of the functional relationship between the inputs and output, but the efficiency estimates can be confounded with effects of random noise, measurement error, and exogenous factors beyond the manager‘s control[7].

The choice between the two approaches depends on the type and quality of data available,and the underlying reasons for estimating productive efficiency. With good quality data, non–parametric measures can be adept at discovering relationships between inputs and output that are hidden to other methodologies[8].

Economic literature on productive efficiency identifies two non–parametric methods for obtaining efficiency estimates, namely data envelopment analysis (DEA) and total factor productivity indices (TFP). Technical efficiency scores can be obtained by running a constant return to scale (CRS) DEA model[9], or a variable return to scale (VRS) DEA model.

[5] vide Coelli et al., 1998 for an overview of the two approaches
[6] Coelli et al., 1998
[7] Fare et al., 1985; Lovell, 1993; Ray, 2004
[8] Cooper et al.,2004
[9] Charnes et al., 1978

FARM PRODUCTIVITY

How many times have we heard that large farms are more productive than small farms? Or that they are more efficient? And that we need to consolidate land holdings to take advantage of that greater productivity and efficiency? The actual data shows exactly the reverse for productivity: that smaller farms produce far more per unit area than larger farms. Part of the problem lies in the confusing language used to compare the performance of different farm sizes. As long as we use crop yield as the measure of productivity, we will be giving an unfair advantage to larger farms.

TOTAL OUTPUT VERSUS YIELD

If we are to fairly evaluate the relative productivity of small and large farms, we must discard "yield" as our measurement tool. Yield means the production per unit area of a single crop, like "metric tons of corn per hectare." One can often obtain the highest yield of a single crop by planting it alone on a field -- in a monoculture. But while a monoculture may allow for a high yield of one crop, it produces nothing else of use to the farmer. The bare ground between the crop rows -- empty "niche space" in ecological terms -- invites weed infestation. The presence of weeds makes the farmer invest labor in weeding or capital in herbicide.

Large farmers tend to plant monocultures because they are the simplest to manage with heavy machinery. Small farmers on the other hand, especially in the Third World, are much more likely to plant crop mixtures -- intercropping -- where the empty niche space that would otherwise produce weeds instead is occupied by other crops. They also tend to combine or rotate crops and livestock, with manure serving to replenish soil fertility.

Such integrated farming systems produce far more per unit area than do monocultures.Though the yield per unit area of one crop—corn, for example—may be lower on a small farm than on a large monoculture, the total output per unit area, often composed of more than a dozen crops and various animal products, can be far, far higher. Therefore, if we are to compare small and large farms we should use total output, rather than yield. Total output is the sum of everything a small farmer produces: various grains, fruits, vegetables, fodder, animal products, etc. While yield almost always biases the results toward larger farms, total output allows us to see the true productivity advantage of small farms.

FARM SIZE AND PRODUCTIVITY RELATIONSHIP (CASE STUDIES REVIEW)

Small farms play multiple key functions in rural economies, cultures and ecosystems worldwide. In this section I summarize some of the evidence for these claims.

To look at the production efficiencies of small and large farms observations for output and input prices of small and large crops are used. The data for inputs and outputs, and the explanatory variables used in various studies were obtained from the :

1. The data were collected through face–to–face interviewing of farm households using a structured questionnaire.

2. Farm Management Data Bank .

Surveying the data we indeed find that small farms almost always produce far more agricultural output per unit area than larger farms. This holds true whether we are talking about an industrial country like the United States, or any country in the Third World. This is now widely recognized by agricultural economists across the political spectrum, as the"inverse relationship between farm size and output" (Barret, 1993; Ellis,1993; Tomich et al., 1995; Berry and Cline, 1979; Feder, 1985; Prosterman and Riedinger, 1987; Cornia, 1985; to name a few).

Even leading development economists at the World Bank have come around to this view, to the point that they now accept that redistribution of land to small farmers would lead to greater overall productivity (Deininger, 1999; Binswanger et al., 1995), a view long since arrived at by others (vide Sobhan, 1993; Lappé et al., 1998).

Table 1 shows the relationship between farm size and output per acre in the United States. The smallest farms, those of 27 acres or less, have more than ten times greater dollar output per acre than larger farms. While this is in large part due to the fact that smaller farms tend to specialize in high value crops like vegetables and flowers, it also reflects relatively morelabor and inputs applied per unit area, and the use of more diverse farming systems (Strange, 1988).

Figure 1 graphically shows the relationship between farm size and total output for fifteen countries in the Third World. In all cases relatively smaller farm sizes are much more productive per unit area—2 to 10 time more productive—than are larger ones. We observe two general forms of the relationship, as shown in Figure 2. Curve I is found in countries where the smallest reported farm size category is the most productive per unit area. Curve IIis found where the most productive size category, while not the smallest, is still relatively small. All countries for which data is available fit one of these two types. The data presented in Table 1, from the U.S., clearly matches type I.

Table 1: Farm Size versus Output in the United States, 1992

Median Farm Size Category (Acres)	Average Gross Output ($/Acre)	Average Net Output ($/Acre)
4	7424	1400
27	1050	139
58	552	82
82	396	60
116	322	53
158	299	55
198	269	53
238	274	56
359	270	54
694	249	51
1364	191	39
6709	63	12

Source: U.S. Agricultural Census, vol. 1, part 51, pp. 89-96, 1992.

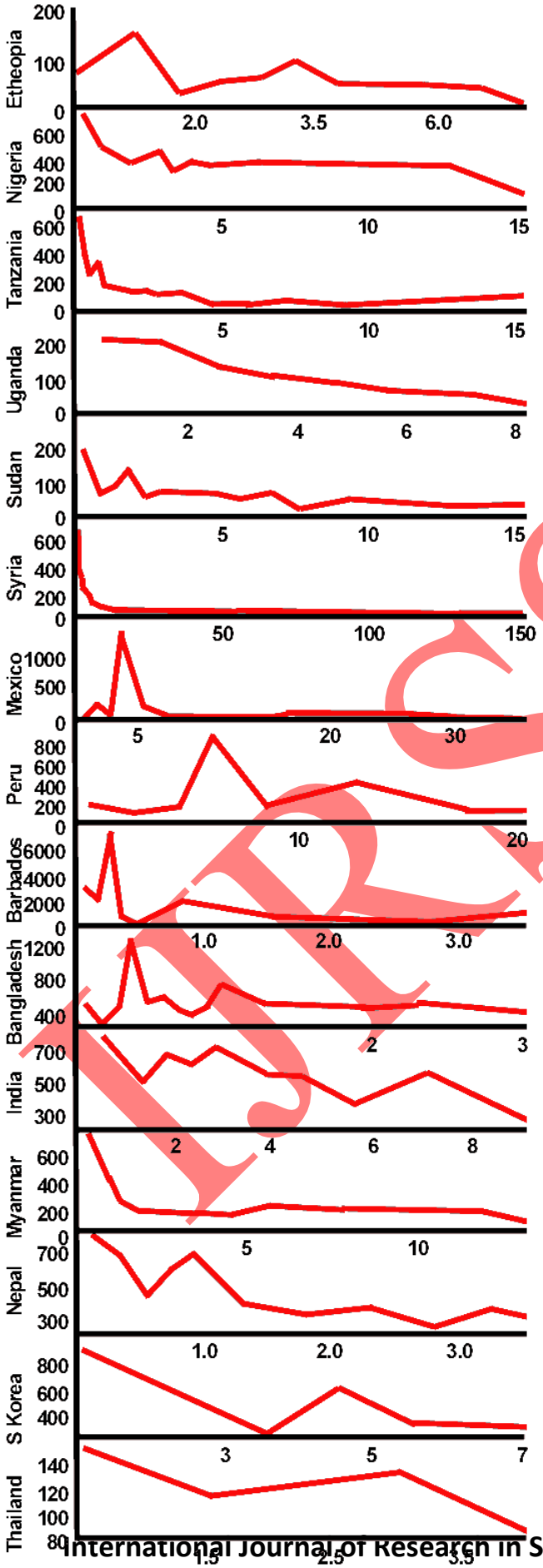
Etheopia
Nigeria
Tanzania
Uganda
Sudan
Syria
Mexico
Peru
Barbados
Bangladesh
India
Myanmar
Nepal
S Korea
Thailand
Farm Size Category (ha)

Fig - Figure 1 : The relationship between farm size and total output in different countries (after Cornia, 1985).

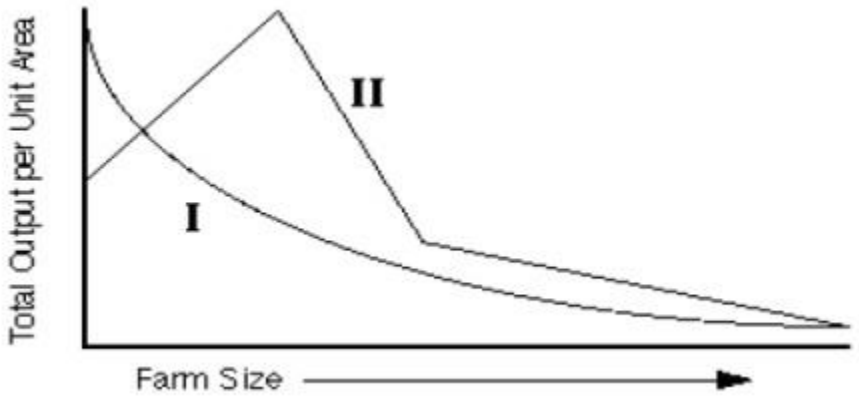

Fig 2. Typical forms of the relationship between farm size and total output. In Type I the smallest farm sizes produce the most total output per unit area. In Type II the most productive size class is not the smallest, but is still relatively small. These idealized types have been abstracted from the data presented graphically in Fig1

SMALL FARM EFFICIENCY

While small farms are clearly more productive than large farms in terms of output per unit area, claims are often made that large farms are still more efficient. To start with, this depends on the definition of efficiency that one chooses. Small farms make more efficient useof land. Large farms generally have higher labor productivity due to mechanization, so they might be considered to be more efficient in labor usage. The definition of efficiency most widely accepted by economists is that of "total factor productivity," a sort of averaging of the efficiency of use of all the different factors that go into production, including land, labor, inputs, capital, etc. Tomich et al. (1993, p.126) provide data from the 1960s, 70s and early 80s, which show small farms have greater total factor productivity than large farms in Sub- Saharan Africa, Asia, Mexico and Columbia. The curves follow the same patterns, Types I or II, shown in Figure 2 for farm size vs. output. More recently, the same pattern has been foundin Honduras (Gilligan, 1998).

In industrial countries like the U.S. the pattern is less clear. The consensus position isprobably that very small farms are inefficient because they can't make full use of expensive equipment, while very large farms are also inefficient because of management and labor problems inherent in large operations. Thus peak efficiency is likely achieved on mid-sized farms that have one or two hired laborers, giving the U.S. an efficiency curve like the Type II productivity curve, but with the peak more toward mid-size than small (Strange, 1988, pp. 80-81; see also Madden, 1967). In a recent, detailed analysis of true total factor productivity, corrected for a number of biases in the data, the author concludes that advantages to larger farm sizes found by some analysts "disappear, while there is evidence of diseconomies as farm size increases" (Peterson, 1997).

In other words, even in the United States, there is no reason to believe that large farms are more efficient, and very large farms may in fact be quite inefficient. But there is far more to the economic importance of small farms once we move outside the farm gate and askquestions about economic development.

FARM SIZE AND PRODUCTIVE EFFICIENCY: LESSONS FROM SMALLHOLDER FARMS IN KENYA

Oduol and Hotta et al (2006)[10] examines the effect of farm size on the productive efficiency of smallholder farms in a land–scarce Embu district of Kenya. They establish the relationship between farm size and three components of productive efficiency, namely technical, scale and allocative efficiency. The results suggest that gains from improving technical efficiency exist in all farm categories, although they appear to be much higher on large and on medium farms than on small farms. While small farms tend to use land more intensively in an attempt to alleviate land constraints, the study suggests that the relatively higher level of technical efficiency observed on small farms is largely attributable to the adoption of traditional land saving techniques rather than the use of modern land saving technologies. On the other hand, scale inefficiency is found to account for a larger share of technical inefficiency on small farms than on medium and on large farms, suggesting that increasing the scale of operation is necessary if the households have to improve technical efficiency. Likewise, small farms are found to be less allocatively efficient than medium and large farms. Nevertheless, gains from improving allocative efficiency exist in more than 90% of the sample households. Accordingly, measures aimed at reducing labour congestion on the farms, relaxing liquidity constraints, and improving the functioning of land rental markets can significantly improve productive efficiency.

LAND POLICY AND FARM EFFICIENCY:THE LESSONS OF MOLDOVA (EASTERN EUROPE)

Dragos Cimpoies & Zvi Lerman (2007)2 in a research paper presented their finding (Fig. 3) regarding "total factor productivity" for individual (small) and corporate farms (1990-2003) of Moldova (Israel). They concluded that individual farms are more efficient than corporate farms.

[10] Oduol, Judith Beatrice Auma; Hutta, Kazuhiko ; Shinka, Shoji and Tsuji, Masao J. Fac. Agr., Kyushu Univ., 51 (2), 449–458 (2006)

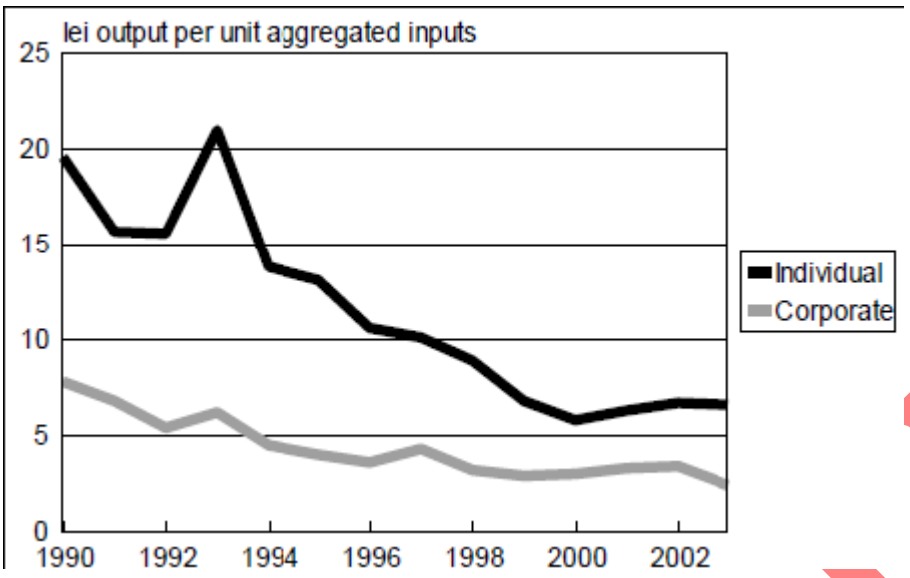

Figure 3: Total factor productivity for individual and corporate farms 1990-2003

THE RELATIONSHIP BETWEEN FARM SIZE AND PRODUCTIVITY IN CHINESE AGRICULTURE

Zhuo Chen et al (2005)[11] examines the relationship between farm size and productivity in China's agriculture. In developing agriculture where there is a broad range of farm sizes, farm size and productivity or output per unit of land are often found to be inversely related. InChina, where average farm size is small and the distribution of farm sizes is relatively compact, farm size and productivity are weakly inversely related. However, when theyutilized the egalitarian principle during land allocation in China and use imputed homogenousland area rather than actual land area in the regression, the inverse relationship between farm size and productivity disappeared.

Hence, the strong inverse relationship that some studies have found are undoubtedly due to a number of methodological problems, including the failure to account properly for land quality differences and the method of land distribution.[12]

The evidences from various countries demonstrate that small farms are "multi-functional"—more productive, more efficient, and contribute more to economic development than large farms. Small farmers can also make better stewards of natural resources, conserving biodiversity and safe-guarding the future sustainability of agricultural production.

[11] Dragos Cimpoies & Zvi Lerman (2007), "Land Policy and Farm Efficiency: The Lessons of Moldova (Israel)" Paper presented at the 104th joint EAAE-IAAE Seminar on Agricultural Economics and Transition: What was Expected, What We Observed, the Lessons Learned, Corvinus University, Budapest, Hungary, September 6-8, 2007. http://departments.agri.huji.ac.il/economics/indexe.html

[12] Zhuo Chen , Wallace E. Huffman, Scott Rozelle The relationship between Farm size and productivity in Chinese Agriculture Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Providence, Rohde Island, July 24-27, 2005

THE RELATIONSHIP BETWEEN FARM SIZE AND PRODUCTIVITY: CALCULATION METHOD

Benjamin (1995) and Heltberg (1998) considered a simple regression of logarithm of grain output on logarithm of sown area:

$$\ln q_i = a\ 0 + g \ln l_i + h_i \quad (1)$$

where q is the real value of grain output, l is land area in grain production, *h* is the random disturbance. Note that if *g* is equal to 1 in equation (1) then output per unit land is unrelated to the farm size. If *g* is less than one, then grain yield per unit land declines as land area increases.

Finally, if *g* is larger than one, then grain yield per unit of land increases with land area. Benjamin (1995) argued that using the actual area harvested rather than total farm size reduces measurement error, which otherwise could introduce a spurious inverse relationship.

FARM SIZE AND PRODUCTIVITY RELATIONSHIP: SOME EVIDENCES FROM INDIA

One of the early attempts to examine the relationship between farm size and productivity was the article published by A.K. Sen (1962) in which he stated by and large, productivity per acre decreased with increase in size of holding. The inverse relationship was derived based on size class data; and Sen himself was however, aware of the limitation of his conclusion since he was using only aggregated data. Sen (1964) subsequently gave three alternative linesof explanation for this phenomenon, (i) technique-based, (ii) labour-based, and (iii) fertility-based. According to Dipak Mazumdar (1965), Khusro (1968), Hanumantha Rao (1966), Saini (1971) –the inverse relationship between farm size and productivity is a confirmed phenomenon in Indian agriculture and its statistical validity is adequately established.

However, some doubts were expressed about the statistical validity of the _inverse relation', by A.P. Rao (1967) who, based on analysis of disaggregated data relating to individual holdings, came up with results contradicting the hypothesis that yield per acre falls as farm size increases. Rudra's (1968a) analysis of individual holding, in 20 villages strengthened this doubt. In another follow-up study, working with size-group data Rudra (1968b) challenged the validity of generalizing the inverse relation for the whole of India.

On the contrary, Usha Rani's (1971) studies in Intensive Agricultural Development Programme (IADP) districts using farm level observations showed that neither cropping pattern nor inputs intensity nor even yield per acre differs across farms of different sizes. Using aggregated data relating to individual districts for the period between 1954 and 1957, Krishna Bharadwaj (1974) investigated the relationship between productivity and size of farm and found that in the majority of cases, an inverse relationship existed; however, it was not statistically significant. Utsa Patnaik (1972) argue that –a very considerable difference is made to the farm variables with changing economic size of farms, depending on how we

measure this economic size. With acreage as a measure of economic size, i.e.; of the scale of production, we obtain one set of results; with an alternative index of the scale of production, we may obtain diametrically opposite results.

Further, in a situation of changing techniques, the grouping of farm data by acreage is likely to obscure some very important feature of the dynamics of agricultural change‖.

Yet, another study using statistical tests with data from sources other than FMS is that of Nirmal Chandra (1974). He carried out two different exercises. One was a three-way analysis of variance, where the three factors were different farm sizes, farms having different shares of family labour and farms having different proportions of leased in lands. His results from the two lines of analysis were however not consistent with each other.

Another important contribution to this debate is by Chadha (1978) who looked at farm level data for three agro-climatic regions in the Punjab for the year 1969-70. He found that the inverse relationship had ceased to hold in the more dynamic zones. A.K. Ghose (1979) re-examined the FMS data and argues that an essential pre-condition for the existence of the inverse relationship phenomenon is technical backwardness. Rudra and Sen (1980) attempted to review the main findings – both analytical as well as empirical– in the light of the original presentation of the issues. The general conclusion was the diversity of Indian agriculture with regard to the relationship between size and productivity: the negative relation may‖ Rudra (1983) concluded that: ‒there is no scope for propounding a general law (for an inverse relationship or even for a positive relationship).‖

Pol Barbier (1984) has questioned the very logic of establishing the relationship between farm size and productivity. He regarded the inverse relationship thesis as spurious andwithout any theoretical meaning.

Madhusudan Ghosh (1989) examined the changes in the agrarian structure of rural West Bengal during the seventies. He hypothesised that in a dualistic agrarian structure in which large farms under-utilized land due to shortage of family labour and small farms under-utilized family labour due to scarcity of land, a reduction in the degree of inequality in the distribution of operational land would favourably affect agricultural productivity.

In his attempt to develop a theory of optimum land reform for dualistic agriculture, Raj Krishna, after examining various Indian studies based on Farm Management data, came tothe conclusion that ‒a reduction in the size of holdings and land concentration brought out by land reform, will not be associated with a reduction in output per acre, after a new equilibrium is established. On the contrary the output per hectare and hence the total outputof a given area of land is likely to increase.‖ Vijayakrishna (1995).

A recent study by Chattopadhyay and Sengupta (1997), using farm level disaggregated data for 1989-90 for West Bengal, suggests that ‒the inverse relation between farm size and productivity becomes stronger in the agriculturally developed regions of West Bengal compared to the relatively less developed regions. This is possibly due to the effects of green

revolution on smaller size farms. However, to arrive at a comprehensive view of the phenomenon more studies using disaggregated farm level data for different States are required.‖ The conclusions of this study have however been questioned by Dyer (1998). On a critical examination of the data and methodology,

Dyer concludes that the study by Chattopadhyay and Sengupta is defective. He however suggests that more disaggregated farm level data analysis needs to be carried out, especially using larger sample sizes. –Further, a wider range of data need to be collected which relates centrally to peasant differentiation, technological dynamism and the development of capitalist form of agriculture.‖

To sum up, it is often pointed out that the difference in the size of farms is one of the reasons for the difference in yields. It is argued that small cultivators increase cropping intensity on their farms or have multiple crops and that family labour works intensively on such farms thereby increasing output per unit of land. However, studies carried out on the relation between size of farms and productivity show contradicting results. Studies based on aggregated data showed an inverse relationship, but studies based on disaggregated data failed to confirm this. The latter indicates that the inverse relationship exists in certain typesof farms, but the relation cannot be generalised. In addition, the relationship need not be therefor all size groups, for all regions, and for all crops. The debate thus remains inconclusive.

SMALL FARM VIRTUES

The developed as well as in the countries of the Third World, where policies promoting large farm, export agriculture have increasingly eroded the viability of small farms, despite the many benefits small scale production of food offers. The public value of small farms includes:

1. Diversity: Small farms embody a diversity of ownership, of cropping systems, of landscapes, of biological organization, culture and traditions. A varied farm structure contributes to biodiversity, a diverse and aesthetically pleasing rural landscape, and open space.

2. Environmental benefits: Responsible management of the natural resources of soil, water, and wildlife, produces significant environmental benefits for society. Investment in the viability of these operations will yield dividends in the stewardship of the nation's natural resources.

3. Empowerment and community responsibility: Decentralized land ownership produces more equitable economic opportunity for people in rural areas, as well as greater social capital. Land owners who rely on local businesses and services for their needs are more likelyto have a stake in the well-being of the community and the well-being of its citizens. In turn, local land owners are more likely to be held accountable for any negative actions that harm the community.

4. Places for families: Family farms can be nurturing places for children to grow up and acquire values. The skills of farming are passed from one generation to another under family ownership structures. When farm children do not continue to farm, farming knowledge, skills and experience are lost.

5. Personal connection to food: Most consumers have little connection to agriculture and food production. As a consequence, they have little connection with nature, and lack an appreciation for farming as cultivation of the earth for the production of food that sustains us. Through farmers' markets, community supported agriculture, and the direct marketing strategies of small farmers, consumers are beginning to connect with the people growing theirfood, and with food itself as a product of a farmer's cooperation with nature.

6. Economic foundations: Small farms are vital to the economy and central to maintaining community and to the sustainability of agricultural production. On the small farm, productive activities, labour mobilization, consumption patterns, ecological knowledge and common interests in long-term maintenance of the farm as a resource, contribute to a stable and lasting economic and family based enterprise. Family farmers regularly achieve higher and more dependable production from their land than do larger farms operating in similar environments. Labour intensive practices such as manuring, limited tillage, ridging, terracing,composting organic matter, and recycling plant products into the productive process, enhance soil conservation and fertility[13].

Small farmers have developed and use a variety of technologies, crops, and farming systems. Perhaps most important in an era of diminishing non-renewable resources, small farmers frequently produce with minimal recourse to expensive external inputs[14].

SUMMARY AND CONCLUSIONS

For more than a century mainstream economist in both capitalist and socialist countries have confidently and enthusiastically predicted the demise of the small, family farm. Small farms have time and again been labelled as backward, unproductive and inefficient—an obstacle to be overcome in the process of economic development. The American model of large scale, mechanized, corporate agriculture is held out as the best, if not the only way to efficiently feed the world's population. Small farmers—or "peasants"—have been expected to go theway of the dinosaurs, and rightly so, according to conventional wisdom.

However, the researchers from different countries during the past two decades have challenge the conventional wisdom about small farms and assert that they are "multi-functional"—more productive, more efficient, and contribute more to economic development than large farms. They argued that small farmers make better stewards of natural resources, conserving biodiversity and better safeguarding the sustainability of production. The evidence they

[13] Netting, 1993
[14] Ibid.

presented comes from both the Third World and from industrialized countries like the United States.

With more than one billion people, India is the world‘s second most populous country and the largest democracy. India‘s small-holder farmers (those owning less than 2.0 ha of farmland) comprise 78 percent of the country‘s farmers, but own only 33 percent of the total cultivated land; they nonetheless produce 41 percent of the country‘s food-grains. Their productivity is somewhat higher than that of medium- and large-size farms.

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