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INCREASING NUMBER OF SMALL FARMS IN INDONESIA: CAUSES AND CONSEQUENCES

Tahlim Sudaryanto
Director, Indonesian Center for Agriculture Socio Economic and Policy Studies, Ministry of Agriculture, the Republic of Indonesia, Jl.A.Yani No.70, Bogor 16161, Indonesia, email: tahlim@indo.net.id

Sri Hery Susilowati
Agricultural Economist, Indonesian Center for Agriculture Socio Economic and Policy Studies, Ministry of Agriculture, the Republic of Indonesia, Jl.A.Yani No.70, Bogor, 16161, Indonesia, email: srihery@yahoo.com

Sumaryanto
Agricultural Economist, Indonesian Center for Agriculture Socio Economic and Policy Studies, Ministry of Agriculture, the Republic of Indonesia, Jl.A.Yani No.70, Bogor, 16161, Indonesia, email: sonysumaryanto@yahoo.com

Abstract

Acording to agricultural cencus data, the percentage of small farms (holding <0.5 ha) has increased from 48.5% in 1993 to 56.5% in 2003. Evidence from micro panel data is also inline with this observation. In rice farming region of Java, average farm size has declined from 0.49 ha in 1995 to 0.36 ha in 2007. In the off-Java region, average farm size declined from 1.49 ha in 1995 to 1.35 ha in 2007. The increasing trend of small farm is due to several factors, namely: high population presure coupled with limited non-farm employment, persistent trend of land conversion to non-farm use, and traditional practice of land inheritance. Due to small farm size, rural farm household have to diversify their income to meet their family needs. In Java, 51.7% of household income in 2007 is accounted for non-farm income. This observation implies that strategic policies to increase household income in rural areas are by increasing access to land resources coupled with promoting off-farm and non-farm employment.

Key words: small farm, land conversion, non-farm emplyment.

1. INTRODUCTION

Empirical evidence has shown that modernization along with economic transformation from agriculture to non-agriculture sector has increased competition on land use. Agricultural land faces the strong challenge and pressure, particularly competing use for industrial and residential purposes, which in turn destroy the existence of agriculture and food security. At a micro level, without sufficient effort to increase productivity, farmer's income and welfare will also decline. Various studies on land holding in developing countries have shown that economic transformation influence the trends on land transaction, but its impact to land holding structure and distribution are varied across countries (Bardhan, 1976; Khrisnaji, 1991).

The process of economic transformation implies that competion of land for non-agriculture use is unavoidable. This conclusion rest on the lower rate of land rent and economic rent of agriculture enterprises compared to that of non-agriculture sector. The ratio of agriculture land rent to industry is 1:500 and to that of housing sector is 1:622. As a consequence, we cannot totaly avoid land conversion from agriculture to non-agriculture use. Agriculture has to rely on marginal land with small average farm size at household level. So far, the government has launch many policies to promote larger farm size. This include, among other things, opening new land, transmigration program, agrarian reform, etc.

The purpose of this paper is to review the existence of small farms, its corresponding causes and consequnces in Indonesia. After introduction in the fisrt section, the second section present an overview of the increasing trend of small farms. The third section analyzes main causes of the small farms phenomenon, which is continued with outlining its consequences in terms of management of the farm and design of agricultural development. Finally, the last section offer some conclusion and implication.

2. INCREASING NUMBER OF SMALL FARMS

Different scientists have used different definition of small farmer. For instance, Sayogyo (1976) classified farmer into four different groups, namely: peasant with farm size <0.25 ha, small with farm size 0.25-1.0 ha, medium with farm size 1.0-2.0 ha, and large with farm size > 2.0 ha. This clasification is commonly used for food crops farming. For horticulture and estate crops farmer we use different concept, because the average size is usually larger, namely: small <2.0 ha, medium 2.0-5.0 ha, and large > 5.0 ha. On the other hand, Central Bureau of Statistic (CBS) considers small farmer as farmer with farm size <0.5 ha. Because the available national data is from the CBS, then in this paper we use a definition used by the CBS.

Agricultural Census data which is published by the CBS showed that the proportion of small farms has increased from 45.3% in 1993 to 56.4% in 2003. The structure of land ownership concentrates around the range of 0.10-0.49 ha. More specifically, the group of farmers with farm size <0.10 ha has increased even more significantly from 7.5% in 1993 to 17.2% in 2003. On the contrary, percentage of farmers with farm size >0.50 ha have declined from 54.7% in 1993 to 43.6% in 2003 (Table 1). This observation indicates that with increasing number of farmers, land holding has been more fragmented toward the group of <0.1 ha.

Table 1. Number of Farm Household by Farm Size, 1993 and 2003

Farm Size (ha)	Number of Farms	
	1993	2003
<0.10	1,594,375 (7.5)	4,269,044 (17.2)
0.10 – 0.49	7,986,510 (37.8)	9,795,545 (39.2)
0.50 – 0.99	4,373,203 (20.7)	4,578,053 (18.4)
1.00 – 1.99	4,422,493 (20.9)	3,460,406 (13.9)
>2.00	2,779,390 (13.1)	2,801,627 (11.3)
Total	21,155,971 (100)	24,868,675 (100)

Number in parentheses are percent of total number of farms.
Sources: Central Bureau of Statistic CBS), 1993 and 2003.

Data from village household survey in six provinces of Java and Off-Java also confirm this national trend. Number of small farms (<0.50 ha) in 2007 was accounted for 43.% of total samples, and percentage of farm cultivating <0.25 ha was around 27.4%. In Java with high population density, the number of small farms was accounted for 57.0%, whereas in the Off-Java region, the number of small farms was around 37.4%. Furthermore, percentage of landless household in Java was also higher (12.4%) compared to that in the Off-Java (7.1%). This information is presented in Table 2. Landless household access to land for farming is by way of sharecropping, leasehold, etc. In the Off-Java region, farm size structures is concentrated) at the small farm (<0.50 ha) and to a lesser extent at the larger group (>2.00 ha).

With increasing trend of small farms, average farm size also shows a declining pattern. In an irrigated areas of Java, average farm size declined from 0.49 ha in 1995 to 0.36 ha in 2007 (Table 3). Similar trend was also observed in dry land areas. In the Off-Java regions, average farm size was larger than that in Java, but also shows a declining trend in the last 10 years. Compared to some other Asian countries, average farm size in Indonesia is the smallest. In 1990, average farm size in some other Asian countries was as follows: 3.36 ha in Thailand, 1.55 ha in India, 1.37 ha in Japan, 1.23 ha in South Korea, and 0.43 ha in China (Fan and Chan-Kang, 2003).

Declining trend of farm size and increasing number of small farms is also followed by more skewed land distribution, particularly in the irrigated areas of Java, as shown by increased value of Gini Ratio (Table 4). More skewed land distribution is also observed in dry land areas with food crop and horticulture farms. On the contrary, in dry land areas of Java, land distribution tends to be more equalized.

Table 2. Distribution of Farm Household by Farm Size, 2007 (%)

Farm Size (ha)	Percentage of Farms		
	Java	Off-Java	Total
Landless	12.40	7.05	8.84
0-0.25	40.50	20.75	27.35
0.25-0.50	16.53	16.60	16.57
0.50-0.75	14.05	9.13	5.25
0.75-1.00	7.44	10.37	4.14
1.00-1.25	1.65	9.96	1.93
1.25-1.50	3.31	6.22	10.77
1.50-1.75	3.31	4.56	9.39
1.75-2.00	0.83	2.49	7.18
>2.00	0.00	12.86	12.86

Source: Indonesian Center for Agriculture Socio Economic and Policy Studies, ICASEPS (2008)

Table 3. The Changes of Average Farm Size in Rural Indonesia, 1995 and 2007

	Region/Land Type	Farm size (ha)	
		1995	2007
1	Java, irrigated land	0.493	0.360
2	Java.,dry land	0.397	0.298
3	Off Java , irrigated land	1.491	1.347
4	Off Java.,dry land (food crop & horticulture)	0.987	0.985
5	Off Java, dry land (estate crops)	1.283	1.202

Sources: ICASEPS (2008)

Table 4. Gini Ratio of Land Holding in Java and Off-Java, 1995 and 2007

	Region/Land type	1995	2007
1	Java. Irigated land	0.55	0.59
2	Java.,dry land	0.56	0.49
3	Off Java , irigated land	0.64	0.59
4	Off Java.,dry land (food crops&horticulture)	0.44	0.61
5	Off Java, dry land (estate crops)	0.43	0.42

Sources: ICASEPS (2008)

3. MAJOR COUSES OF INCREASING SMALL FARMS

3.1. Growing Population and Farm Households

The primary factor contributing to increasing number of small farms is high population growth which cannot be absorbed by employment in the non-farm sector. Indonesian

population has grown at a rate of 1.45% per annum during 1990-2000 and 1.34%/annum during 2000-2006 (CBS, 2007). Consistent with population growth in general, farm household also increased from 20.8 million in 1993 to 25.6 million in 2003. In addition to its absolute number, proportion of farm household to total household also increased from 20.5% in 1993 to 24.4% in 2003 (Table 5). With relatively constant agricultural land, this implies increasing number of small farm overtime.

Table 5. Changes on the Structure of Farm Household, 1993 and 2003

Description		Java	Off-Java	Total
1993	a. Farm household (million)	11.7	9.1	20.8
	b. Farm household with land (million)	11.6	8.9	20.5
	c. Small farm household (million)	8.1	2.7	10.8
	e. Proportion of small farm (%)	69.76	30.57	52.66
2003	a. Farm household (million)	14.0	11.6	25.6
	b. Farm household with land (million)	13.4	11.0	24.4
	c. Small farm household (million)	10.0	3.7	13.7
	e. Proportion of small farm (%)	74.68	33.68	56.20

Sumber : CBS (2004).

In addition to the changes on land holding and average farm size, we also observe the changes on production system. Table 6 shows that proportion of paddy and secondary crops farmers have declined during 1993-2003 period. This indicates high rate of land convertion in irrigated paddy areas, particularly in Java. As a consequence, farm household shift their farming activities to less fertile dry land areas with also fragile environment.

3.2. Land Conversion

Increasing demand for land in the non-farm sector such as industry, residential, road infrastructures has lead to significant rate of land conversion, particularly irrigated land in Java. The land conversion is *irreversible* and tend to be *progresif* (Sumaryanto et.al., 2001; Simatupang and Irawan, 2002; Sumaryanto and Sudaryanto, 2005).

According to Nasution (2004) average rate of irrigated land convertion is estimated around 110 thousand hectare per annum. This include convertion of irrigated land to non-farm use and non-rice crops. In Java, irrigated land is converted mostly to non-farm purposes, namely 58.7% to residential areas and the rest for industry, shopping mall, etc. In the Off-Java region, 16.1% of irrigated land is converted to residential complex, 49.0% converted to other agricultural purpose, and the rest for various uses. Furthermore, if there is no significant policy in place, then based on current spatial planning, around 42% of total irrigated land will be converted to non-farm use. In Java and Bali the percentage of irrigated land conversion is even higher, around 49% (Winoto, 2005).

Agricultural Census data shows that land conversion is observed particularly in the year of 1983-1993 (Table 7). In that period, the priority of government policy was to promote economic development through manufacturing industry which require sufficient and better

infrastructure. As mentioned by Nasution (1994), that in those period land conversion was driven by high population growth and economic transformation from agriculture to industry.

Table 6. Distribution of Farm Household by Commodity, 1993 and 2003 (%)

Description	Java	Off-Java	Total
1. 1993:			
a. Paddy/secondary crops	52.2	45.4	49.1
b. Horticulture	13.2	14.1	13.6
c. Estate crops	11.9	23.2	17.1
d. Cultured forrest	4.1	1.0	2.7
e. Livestock/poultry	15.8	14.7	15.3
f. Inland fishery	2.8	1.5	2.2
g. Other fishery farm	0.3	0.2	0.3
2. 2003:			
a. Paddy/secondary crops	43.9	33.9	39.2
b. Horticulture	20.7	19.6	20.2
c. Estate crops	8.4	25.9	16.7
d. Cultured forrest	11.2	4.5	8.1
e. Livestock/poultry	13.3	14.9	14.1
f. Inland fishery	2.3	1.1	1.8
g. Other fishery farm	0.3	0.4	0.3

Sources: CBS, 1994, 2004.

Table 7. Agricultural Land Conversion, 1983-2003 (000 ha)

Region	Total agricultural land			Land conversion	
	1983	1993	2003	1983-1993	1993-2003
Java	5,422	4,407	4,020	-1,015	-387
Bali & Nusa Tenggara	1,208	1,060	1,096	-148	+35
Sumatera	5,669	5,410	4,250	-252	-1,167
Sulawesi	1,638	1,772	2,185	+135	+412
Kalimantan	2,222	2,192	2,096	-31	-95
Maluku	379	400	352	+22	-48
Irian Jaya	166	176	142	+9	-34
Total	16,704	15,424	16,704	-1,280	-1,264

Sources: CBS, 1984, 1994, 2004.

3.3. Inheritance System

Inheritance system is widely practiced in Indonesia and contribute to the declining farm size and land fragmentation. Household survey data (Table 8) shows that the primary source (60%) of land asset for the rural household is inheritance from their parent or relatives. Other sources are from purchasing, mortgage, lease holding,etc.

Table 8. Sources of agricultural land at household level, before 1987–2007,(%)

Time period	Inheritance	Purchasing	Other	Total
Before - 1987	55.61	33.90	10.49	100.00
1988 – 1992	40.00	54.44	5.56	100.00
1993 – 1997	58.06	39.52	2.42	100.00
1998 – 2002	34.04	61.70	4.26	100.00
2003 – 2007	60.80	32.80	6.40	100.00

Sumber: ICASEPS. 2008

4. CONSEQUENCIES OF SMALL FARM

Conventional view considers small farm as being inefficient, backward, etc., so that larger farm is more desirable. However, numerous studies also show that small farm is at least as efficient as the large farm (see for instance, Peterson, 1997). The scale economies argument applies only in the manufacturing sector, but not in agriculture. Furthermore, there is also evidence an inverse relationship between farm size and productivity. Small farm produce more yield per hectare compared to the large farm (Rosset, 1999). Based on this evidence, it can be concluded that at the farm level, farm size does not matter. The characteristics of small farm do provide further consequences on the management of the marketing and provision of support services which will be discussed briefly in the following.

4.1. Imperfect input and output market structure

A large number of small farms have to face a limited number of both input supplier and output buyer. In another word, the input market tends to be oligopolistic, whereas the output market tends to be oligopsonistic. This market structure leads to imbalance of bargaining power between farmers and input suppliers or output buyers. As a consequence, farmers usually have to pay higher input prices and receive lower output prices.

4.2. Multiple employment and income sources

Income generated from the small plot of land, no matter how intensive it is, cannot fully cover the farm family need. This leads to household characteristic with multiple employment and income sources structures. Evidence from rural Indonesia shows that with declining trend of farm size, the share of farm income to total income was also declined. In rural Java, share of farm income to total income decreased significantly from 50% in 1995 to 25% in 2007 (Sudaryanto and Sumaryanto, 2008). In the rice-based villages, the share of farm income is 58% in Java and 46% in the Off-Java. Whereas, in the dry land areas with food

crops and horticulture , the share of farm income is around 52% in Java and 48% in Off-Java (ICASEPS, 2008).

Being a small farm also implies increasing share of labour allocation to the non-farm activities (part time farmer). This phenomenon can be seen from labour participation. By using household as unit of analysis, labour participation rate is estimated at 61% in farm labour, 36% in non-farm enterprise, and 22% in non-farm labour. On the other hand, if we use individual unit of analysis, the participation rate is as the following: 37% in own farm, 20% in own farm and farm labour, and 12% in farm plus non-farm activities.

The increase of small farm also leads to more migration out of the village. By using a multinomial logit analysis, our data shows that farm size is negatively related to the migration rate. It means that the smaller the farm size the higher the probability to migrate out of the village.

4.3. Increasing cost of support services

Small and fragmented farms lead to higher cost of support services supplied by government or private sector. On the public services these include technology dissemination, plant protection, human resource and institutional development. On the part of private sector, higher cost is also incurred on delivery of inputs and collection of output to be marketed.

5. CONCLUSION AND IMPLICATION

Due to population pressure and limited non-farm employment, the number and percentage of small farms is increasing. This observation is particularly more apparent in Java with higher population density and more limited land resources. In addition to smaller farm size, land distribution also tends to be more skewed. With small farm size, farm households have to diversify their employment and income sources.

Major implications of this observation are: (a) any government policy should be designed suitable to the characteristic of small farm; (b) to increase bargaining position of the small farms and to capture scale economies, we need to strengthen farmer association; (c) non-farm activities in rural areas should be promoted consistently, to absorb surplus labour in the farm sector and to enhance more diversified income sources for the farm household; (d) in the long-run, effort to increase access to land for the small farmer should be intensified, which include opening up new land, and implementing land reform.

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