

# Role of farmer group institutions in increasing farm production and household food security

**Rahmadanih, S Bulkis, M Arsyad, A Amrullah and N M Viantika**

Department of Agricultural Socio-economics /Agribusiness, Faculty of Agriculture, Hasanuddin University, Jalan Perintis kemerdekaan KM 10, Makassar, 90245, Indonesia.

E-mail: *rahmadani.rosek@yahoo.com*

**Abstract.** Food productions and food security are still becomes serious issue in agriculture development. The research objectives are (1) Examining the role of Farmer Group in increasing farm production and (2) Analyzing the role of Farmer Group in relationship with the household food security. The research was conducted in Soppeng District, South Sulawesi, Indonesia by taking unit of analysis at household level of Farmer Group members. Sample were 6 farmer groups, consisting of 365 households. The Results showed that the Farmer Group has a good role as a production, collaboration and market unit to increase farming production (score 2.3-2.6), but haven't much impact to increase household food security. Rice production are 4.2 – 6.2 tons per hectare and household food security level are “low and marginal food secure” (mean score 4 and 6). Nevertheless, the role of Farmer Group showed a positive relationship with the level of household food security. So, it is necessary to increase the role of Farmer Group in order to increase income and household food security based on Farmer Group's needs and potencies through facilitation of (a) seed and water/irrigation availability, (b) preparing organization rules (AD/ART) and (c) appropriate training and education of food and nutrition.

## 1. Introduction

Food security is still become a global issue in developing country and Indonesia is no exception. There were 47.02 million (19.04 percent) of Indonesian populations in very low food security category and 83.65 million (33.87 percent) falls into low food-security and then 116.31 million (47.09 percent) in food security category [1]. Food security is determinate of food system including food production, while the food production is resultant of various factors. One of that is the role of agricultural institutions in management of agricultural resources, including farmer institutions [2] and [3]. Therefore, it is really necessary to study on food security in various aspects, including role of stakeholders. One of the important stakeholders is farmers group (called *Poktan*) and/or joined farmers group (*Gapoktan*). The research objectives are (1) examining the role of Farmers Group (*Poktan*) in increasing farm production and (2) analyzing the role of *Poktan* in relationship with the household food security.

## 2. Research Method

Design of the research was cross sectional study conducted in Manorang Salo and Panincong villages



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of Mariorawa subdistrict, Soppeng District, South Sulawesi Province. The criteria of village samples were: (1) One village near from capital subdistrict and one village far from capital subdistrict. Data collection was carried out during May-August, 2016. The research was designed with qualitative and quantitative (mixed) method [4]. Qualitative data collected through Indepth-Interview and Focus Group Discussion (FGD); while quantitative data collected through household survey in Poktan level. Number of sample Poktan are 6 Groups consist of 365 households, as clearly shown in table 1.

**Table 1.** Sample of Regions, Poktans and Households

No	Village		Farmers Group Selected		Households
	Name	Criteria	Poktans Name	Group Category	
1	Manorang Salo	Near from capital subdistrict	Mappadeceng I	Poktan-1	70
			Mappadeceng	Poktan-2	65
			Mattarima	Poktan-3	65
2	Panincong	Far from capital subdistrict	Akkajangnge I & II	Poktan-1	63
			Cempae	Poktan-2	60
			Akkajangnge	Poktan-3	42

Data of household food consumption was collected through food list method for 7 days and food recall for 24 hour ago [5, 6]. The household food security level is determined through food consumption score (FCS) approaches [7]. If  $FCS \geq 6$  is food-secure category, which can be classified in high food security ( $FCS > 6$ ) and Marginal food security ( $FCS=6$ ). If  $FCS < 6$  is food-insecure category, which can be classified in low food security ( $FCS 4-5$ ) and very low food security ( $FCS < 4$ ). The category of Poktan role consisting is low (score  $<1.0-1.6$ ), moderate (score of  $1.7-2.4$ ) and high (score  $2.5 - 3.0$ ). The relationship between the Poktan role and household food security level were analyzed with Spearman's rho Correlations

### 3. Results and Discussion

#### 3.1. The Role of Farmer Groups in Efforts to Increase Farm Production

One of the important things that can be done by the farmers group as an effort to improve the consumption of food of its members is by increasing the production of farming. Increased production can be pursued through increasing the role of Poktan. Quantitatively, the role of Poktan in carrying out its function (as a production, collaboration and market unit) in Manorang Salo Village is high (score 2.60) while poktan in Panincong Village is moderate (score 2.3-2.4) as shown in table 2.

**Table 2.** The average poktan's roles, production rates and farm income

No	Description	Poktan of Manorang Salo Village			Poktan of Panincong Village		
		Poktan-1	Poktan-2	Poktan-3	Poktan-1	Poktan-2	Poktan-3
1	The Role of Poktan						
	Mean Score	2.6	2.6	2.6	2.3	2.3	2.4
	Category	High	High	High	Moderate	Moderate	Moderate
2	Rice Productions (ton/hectare)	5.7	5.8	6.2	4.2	4.5	4.7
3	Total cost (IDR/hectare)	5,124.8	4,894.6	4,796.2	4,670.0	4,904.2	4,900.0
4	Income (IDR,000/hectare)	21,335.2	23,525.4	25,583.8	15,910.00	17,047.8	18,130.0

Table 2 shows that the role of poktan in performing its function is moderate to high. Nevertheless, it has not significantly contributed to the increase of farmers' production and income. On average, rice production of Poktan in Manorang Salo village reached 5.9 tons per hectare while in Panincong Village reached 4.5 tons per hectare, lower than the district-level average production of 6.68 tons per hectare [8]. The low level of production is related to irrigation conditions that are sometimes not sufficient for farming needs. Although rice production is still low but there has increasing 10 to 25 percent compared the productions three years ago (table 3).

**Table. 3** Farmers Perception to Increase Production of Farms in Marioriawa Sub District  
Soppeng District

No	Perception on Increased Production (compared three years ago)	Manorang Salo Village (percent)			Panincong Village (percent)		
		Poktan-1	Poktan-2	Poktan-3	Poktan-1	Poktan-2	Poktan-3
1	Not increased	0.0	0.0	0.0	0.0	0.0	0.0
2	Increased < 10%	21.4	20.0	20.0	68.3	66.7	52.4
3	Increased 10-20%	65.7	66.2	60.0	17.5	18.3	33.3
4	Increased > 20%	12.9	13.8	20.0	14.3	15.0	14.3
Total		100.0	100.0	100.0	100.0	100.0	100.0

Implementation of the role of farmer groups can improve their activities in managing farming, both rice and crops. As an implication of that role, it can indirectly contribute to the increase of farming production managed over the last three years. The production increase achieved by Poktan members in Manorang Salo dominant village is 10-20 percent while in Panincong Village the dominant is still less than 10 percent

Differences in production levels also cause income differences. The average farm income in Manorang Salo village (IDR. 21,335,200 per hectare – IDR. 25,583,800 per hectare) is higher compared to Panincong Village (IDR. 15,910,000 – IDR. 18,130,000) per hectare. There are 73.8 -80.0 percent poktan members in Manorang Salo with an income increase of more than 20 percent and 69.8 - 73.8 percent in Panincong Village with an income increase of 10.0 - 20.0 percent

Differences in production rates and farm income are related to the different roles performed by poktan, where the average role of poktan in Manorang Salo village is also higher when compared with the role of Poktan in Panincong Village. The role of poktan referred to in this case is related to its function as (1) learning unit, (2) cooperation unit and (3) production unit according to [9].

Based on the results of indepth interviews and FGDs at the sub-district level, the different roles are related to the existence of the Joint Group of Farmers (Gapoktan) is an institution in which the farmers group becomes a larger group. Poktan in Manorang Salo village joined in a Gapoktan called Gapoktan Anugerah and Poktan in Panincong Village joined in Gapoktan Sejahtera. Gapoktan Anugerah more developed when compared with Gapoktan Sejahtera, the management is more active in accommodating the implementation of farmer group functions.

Compared to the previous three years, the role of farmer groups in Soppeng District has been growing, reflected by the development of Gapoktan over the last three years, with the final score of 586 for Gapoktan Anugerah in Manorang Salo Village and score 444 for Gapoktan Sejahtera in Panincong Village [10]. Thus, the high productivity and income of Poktan in Manorang Salo is related to the role of Gapoktan Anugerah especially in facilitating production facilities (fertilizer) and financial capital (for the procurement of pesticides and water pumps) to its members. While Gapoktan Sejahtera does not have financial capital so farmers have to make their own effort in the procurement of pesticides and water pumps, while not all farmers have capital for it. In addition, one of the most prominent forms of institutional strengthening in all Poktan belonging to Gapoktan Anugerah and not

found in Poktan in Gapoktan Sejahtera is the existence of AD / ART which has been ratified at the BP3K level of the Regency.

Based on the existing problems and potentials, institutional strengthening with [6] strategy is needed: Institutional development strategy can be done through approach (1) Models of the institutional support; (2) Models of the human capacity building in rural: and (3) Models of the institutional capacity strengthening.

### 3.2. Household Food Security and Poktan Role Related

Generally, food security is defined as: the condition of food fulfillment in the state up to the individual, who is reflected in the availability of quantity and quality of adequate food, safe, diverse, nutritious, equitable, and affordable and not contrary to the religion, beliefs and culture of the community, to be able to live, healthy, active, and productive in a sustainable [11]. Food security is the out put of the food and nutrition system [12]. Food diversification and food security in the household level tend associated with the local food systems [13] and [14]. Therefore, institutional role related to food and nutrition system is very important and one of them is Institutional group of farmer or group of woman farmer [15] and [16].

The role of poktan in Manorang Salo and Panincong Villages are quite good and has contributed to increasing production and income of farmer group members. Given that production and income are the variables associated with household food consumption, indirectly, the role of Poktan can also contribute to the level of household food security of their members. Household food security in this case is analyzed through Food Consumption Scores (FCS) approach consisting of five food groups namely staple food, side dishes, vegetables, fruits and milk [16]. On average, household food security levels are classified as low till marginal food-security level". The mean FCS achieved ranges 4 to 6 (table 4).

**Table 4.** Average Food Consumption Score (FCS) reached by household member of poktan

No	Food Group	FCS score of Manorang Salo			FCS score of Panincong		
		Poktan-1	Poktan-2	Poktan-3	Poktan-1	Poktan-2	Poktan-3
1	Staple food	2.0	2.0	2.0	2.0	2.0	2.0
2	Dishes	1.0	1.0	2.0	1.0	1.0	1.0
3	Vegetable	2.0	2.0	1.0	1.0	1.0	1.0
4	Fruits	1.0	1.0	1.0	0.0	1.0	1.0
5	Milk	0.0	0.0	0.0	0.0	0.0	0.0
Total FCS		6.0	6.0	6.0	4.0	5.0	5.0
Food Security level		Marginal	Marginal	Marginal	Low	Low	Low

**Table. 5** Farmers distribution by poktan and household food security level in Marioriawa Sub District, Soppeng District

No	FCS	Food Security Level	Manorang Salo Village (percent)			Panincong Village (percent)		
			Poktan-1	Poktan-2	Poktan-3	Poktan-1	Poktan-2	Poktan-3
1	4	Low food security	12.9	18.5	18.5	57.1	58.3	35.7
2	5	Low food security	28.6	23.1	21.5	31.7	26.7	45.2
3	6	Marginal Food security	51.4	50.8	41.5	11.1	11.7	11.9
4	7	High food security	7.1	7.7	18.5	0.0	3.3	7.1
Total			100.0	100.0	100.0	100.0	100.0	100.0

On average, household food security level in Manorang Salo is marginal category while in Panincong Village is low category. Nevertheless, there were 7.1 - 18.5 percent of the households in Manorang Salo is classified as high food security (table 5).

Table 4 and 5 shows that in terms of institutional poktan, on average, the level of household food security among poktan members in each village is relatively the same. But in terms of location, the level of household food security of Poktan in Manorang Salo village is better compared to poktan households in Panincong Village. The condition is related where Poktan's located. Manorang Salo is a village adjacent to the capital sub-district. This means that the village is relatively more accessible to the empowerment programs on the one hand (such as counseling/ informal educations of agriculture and food and nutrition) and on the other hand the villagers are more easily accessible to the food available in the sub-district market when compared to the people in Panincong Village. In addition, the production rate and farm income at the three poktan in Manorang Salo village is higher compared to the three poktan in Panincong Village. Because of differences in production and income of Poktan between two villages related to differences in the role of poktan, indirectly the role of poktan is also related to the level of food security of poktan households (table 6).

**Table 6.** Relationship between poktan role and household food security level in Marioriawa Sub District, Soppeng District

No	Village	Group	Spearman's rho Correlations: Role of Poktan and Food Security		
			Correlation Coefficient	Sig. (2-tailed)	N
1	Manorang Salo	Poktan-1	0.267*	0.026	70
		Poktan-2	0.314*	0.011	65
		Poktan-3	0.335**	0.006	65
2	Panincong	Poktan-1	0.172	0.177	63
		Poktan-2	0.304*	0.018	60
		Poktan-3	0.426**	0.005	42

In table 6, it is seen that the role of poktan is positively related to the level of household food security both in the three Poktans in Manorang Salo Village and the three Poktans in Panincong Village. However, the role of poktan-1 in Panincong Village shows a weak relationship with the household food security levels ( $r = 0.172$  and Sig. (2-tailed) = 0.177). The weakness of this relationship is also related to the level of production and income is relatively low when compared with the other five Poktans. The low production is mainly due to the inadequate conditions of irrigation water and the limited use of production facilities. No funds (group cash) can be borrowed for procurement of production facilities. The group does not yet have an organization rules (AD/ART). In addition, in the last two years, there has been no empowerment activities particularly related to the increase of food and nutrition knowledge.

#### 4. Conclusion

In general, poktan institutes have performed their good role in an effort to increase farm production and income. Nevertheless, the role of poktan in Manorang Salo Village is higher when compared with Poktan role in Panincong Village. The low role of poktan in Panincong Village is related to the low role of Gapoktan Institution in facilitating poktan, especially in the provision of financial capital for the procurement of production facilities (seeds and pesticides) and agricultural equipment (water pumps), as well as its AD/ART. The differences in the role of the institute also resulted in differences in farming production and household income of farmer group members and ultimately impacted the

differences in food security at the household level of farmer group members. Household food security level of farmer group member in Manorang Salo Village is better compared to Panincong Village. More than 58.5 percent of households in Manorang Salo village and just over 11.1 percent of households in Panincong Village are classified as food security. Nevertheless, on average, the level of food security of farmer group members is at "low till marginal food secure" level. There is no difference in the level of household food security between farmer groups in one village, either in Manorang Salo Village or Panincong Village. In general, the level of household food security is positively related to the role of poktan institutional in an effort to increase the production of farming; both poktan in Manorang Salo Village and Poktan in Panincong Village. This means that the higher the role of poktan in increasing production, the better farming will be and in turn making better level of food security. Based on the problems and potentials in the Poktan environment in the two villages, the alternative strategic to increase the role of Poktan based on potency can be recommended to develop farming production and food security include (a) institutional support model (facilitation of seed and water/irrigation availability), (b) human resources capacity building model (appropriate training and education of food and nutrition) and (c) institutional capacity building model (facilitation of preparing organization rules).

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