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EFFECT OF COMMUNITY-BASED FARMER GROUPS WITH SAME PREFERENCE ON ADOPTION OF TECHNOLOGY

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ABSTRACT

Development of community-based famer groups with same prefence, strenthening the groups by training, visting demonstration fields and discusion together with poster exposure in the remote area increased farmer adoption rate and rice area adoption rate of certified seeds and three reductions three gains. Farmers' proper perception and knowledge on certified seeds and three reductions three gains increased. The community-based famer groups with same prefence and poster exposure had postive impact on wide spread of certified seeds and three reductions three gains adoption in the community. Thus, the support polity is necessary in development of community-based farmer groups with same preference for wide spread of advance innovation in rural area

Key words: community-based famer groups, adoption

INTRODUCTION

Though the extension activites were paid attension by local managers, farmer adoption rates of technologies were still low. Farmers' technical knowledge acquire was low (Huan 2005). According to Tuan (2002), farmers' production activites were under un-favorable socio-economic conditions due to limitation of public suport system, even un- available in certain places. Moreover, there was lack of suitable regulation in the rural area. The traditional extension methods were effective but not sustainable and too expensive. The new method was froming farmer groups to increase farmers' right in access to market and cerdit (Madukwe 2006). Thus, the role of public association in development of technical activies and services was critical. Lema and Kapange (2006) said that coomunity based-farmer group was one of the key elements in rural renovation. The development of community-based farmer groups with same preference would be effective in economic development and technology adoption. The technology adoption rate in remote rural area was low due to limitation of extension personnel and farmers' perceptions toward technologies. Development of community-based farmer groups with same preference was one of the strategies in enhancement of technology application by farmers. The objective of this study was to develop community-based farmer groups with same preference in remote area for increasing farmer rates using certified seeds and three reductions and three gains in rice production

RESEARCH METHODS

1. Site selection to develop communtiy-based farmer groups with same preference in adoption of technologies

Two representative sites in the Mekong delta selected to develop of communtiy-based farmer groups with same preference in adoption of technologies were Tien Giang Province and Can Tho city. Informal discusion with Tien Giang Department of Agriculture and Rural Development, Agricultural Extension Centers of Tien Giang province and Can Tho city was conducted to select the districts, communes and villages in remote area to form communtiy-based farmer groups with same preference. Six villages in each district of Go Cong Tay (Tien Giang) Co Do (Can Tho city) selected were 7-15km far from district towns, low development of infra-structures, and small transporation paths (1 to 1.5

m width) and difficult to reach, especially in Co Do district due to sliperry in wet season and many un-durable small bridges. The triple rice system was dominant in these villages.

2. Development of communtiy-based farmer groups with same preference in adoption of technologies::

Agricultural Extension Centers of Tien Giang province and Can Tho city together with district extension stations and local authorities of communes and villages identified farmers with same preference through farmers' meeting and established farmer groups joining as group member was totally volunteer. The farmer groups required the sustainability of groups which are not only for rice technologies but also for other extension activities. Twelve community-based farmer groups with same preference were established.

Newly community-based farmer groups with same preference were trained on technologies related to "three reductions and three gains" and certified seeds. In addition, the synchronized sowing, balance fertilizer and integrated pest management (IPM) were also included in the training.

Farmer members of the groups practiced using certified seeds and followed the technologies of "three reductions and three gains" in the demonstration field in wet season 2008. Farmers discussed and evaluated the rice field themselves

The posters were hanged in the villages to guide farmers practicing the advance technologies in rice production. The content of the poster included synchronized planting based on recommendation of agricultural department; application of three reductions three gains by using certified seeds, balancing N, P, K fertilizers and integrated pest management; reduction of post harvest loss.

3. Evaluation of communtiy-based farmer groups with same preference in adoption of technologies

The impact communtiy-based farmer groups on rice area and rate of farmers using certified seeds and practicing three reductions and three gains were conducted by census in the villages with farmer groups in the following crop season (dry season 2009).

Farmer group members' attitude and knowledge on certified seeds and three reductions and three gains were assessed before and after training by individual interview using the structure questionnaires. There were 230 farmers who participated in 12 community-based farmers groups were interviewed. Focus group discussions were conducted to compliment the information from the interview.

4. Data analysis

Data were summarized in the forms of percentage and means. T-test was used to compare the means of correct answers on attitude and knowledge before and after training. Chi-square test was employed to compare the difference in the levels of knowledge and attitude before and after training.

The question on attitude or knowledge is a statement. Each question has three choices. Farmers' anzwers were compared with the correct answers from the scientists. Farmers attitude or knowledge were classified at three levels: high if >70% are correct answers, medium if >40-70% are corrrect answers, and low if <40% correct answers.

RESULTS AND DISCUSSION

1. Development of community-based farmer groups, training and poster exposure

- There were 6 community-based farmer groups with same preference groups with 117 members, each group had 19-20 members, in Go Cong Tay (Tien Giang) and 6 groups with 113 members, each groups had 15-21 members, in Co Do (Can Tho city)

- Before wet season 2008, farmers of the groups were trained by extension staffs on three reductions and three gains with using certified seeds. There were 3 training classes in Tien Giang (1 class for 2 groups together). There were 6 classes in Co Do district, each groups had one class due to difficult in transportation from village to village for joining groups as in Tien Giang. There were 224 farmer members (occupied 97 %) participated in training among 230 farmers as group members.

- Each group had one demonstration field which varied from 1000 to 1300 m^2. The extension station provided farmers certified seeds for demonstration field. After harvest, farmers evaluated that the demonstration field reduced from 50-80 kg seeds/ha. Normally, they used 200-230 kg seeds/ha. The demonstration field also reduced 346,000 dong for material cost per ha.

The posters were hanged in each village where we conducted demonstration field and development of farmer groups with same preference.

2. Impact of community based farmer group, training and poster exposure

Farmers' perception and knowledge change after participation in community-based farmer groups with same preference, training and visiting field demonstration

Farmers' perception and knowledge on advance technologies as three reduction three gains and certified seeds before and after participation in community-based farmer groups with same preference, training and visiting field demonstration were significantly different (at 1% level). Farmers had low perception on certified seeds before participation in community-based farmer groups with same preference, training and visiting field demonstration (53% of the farmers had ≤40 % of answers with right perception on certified seeds). After participation in community-based farmer groups with same preference, training and visiting field demonstration, there were 87% of them had >70% of answers with right perception on certified seeds.

Nearly haft of the farmers had low perception (47%) and more than one-third of them had high perception (40%) on three reductions and three gains before participation in community-based farmer groups with same preference, training and visiting field demonstration. However, after participation in community-based farmer groups with same preference, training and visiting field demonstration, the rate of farmers had high perception on three reductions and three gains were 98%. The differences in farmers perception on this technology was signicant (at 1% level). (Table 1).

Table 1. Farmers' perception on certified seeds and three reductions and three gains (% farmers) (n= 230)

Level of perception	Participation in community-based farmer groups, training and visiting field demonstration		χ^2
	Before	After	
Certified seeds			
Low	53	4	
Medium	10	9	11,224**
High	37	87	
Total	100	100	
Three reductions three gains			
Low	47	1	
Medium	13	1	12,865**
High	40	98	
Total	100	100	

** Significant at 1%

Level of perception: Low: ≤ 40 % right answers toward perception on technology
Medium: >40 -70% right answers toward perception on technology
High: >70% right answers toward perception on technology

Similarly, farmers' knowledge levels on certified seeds and three reductions three gains were significantly different at 1% between before and after participation in community-based farmer groups, training and visiting field demonstration. Before Participation in community-based farmer groups, training and visiting field demonstration, only 14% of the farmers had high knowledge level (with >70% right answers) on certified seeds. However, after participation in community-based farmer groups, training and visiting field demonstration, this rate was 73%.

Farmers' knowledge level on three reductions three gains was higher than their knowledge on certified seeds before participation in community-based farmer groups due to the information from mass media. There were more than haft of the farmers (38%) had high knowledge level on three reduction s three gains before participation in community-based farmer groups, training and visiting field demonstration. After participation in community-based farmer groups, training and visiting field demonstration, this rate was 92% (Table 2).

Table 2. Farmers' knowledge level on certified seeds and three reductions and three gains (% farmers)

Level of perception	Participation in community-based farmer groups, training and visiting field demonstration		χ^2
	Before	After	
Certified seeds			
Low	49	2	
Medium	37	25	12,509**
High	14	73	
Total	100	100	
Three reductions three gains			
Low	31	1	
Medium	31	7	11,462**
High	38	92	
Total	100	100	

** Significant at 1%

Level of perception: Low: ≤ 40 % right answers toward knowledge on technology
Medium: >40 -70% right answers toward knowledge on technology
High: >70% right answers toward knowledge on technology

Comparison farmers' perception and knowledge on certified seeds and three reductions three gains before and after participation in community-based farmer groups, training and visiting field demonstration, farmers' right perception on certified seeds and three reductions three gains increased 49%, and significantly different. Similarly, farmers knowledge on certified seeds increased 39% and on three reductions three gains increased 33% after participation and significantly different with before participation in community-based farmer groups, training and visiting field demonstration (Table 3).

Table 3. Comparison farmers' perception and knowledge on certified seeds and three reductions three gains

Item	Before	After	Percentage increased (%)	T-value
Certified seeds				
Mean of right answers on perception (n=6)	2.6	5.6		-11.64**
Percentage of right answers on perception (%)	43	93	49	
Mean of right answers on knowledge (n=12)	4.4	9.1		-15.71**
Percentage of right answers on knowledge (%)	37	76	39	
Three reductions three gains				
Mean of right answers on perception (n=7)	3.3	6.7		-12.95**
Percentage of right answers on perception (%)	47	96	49	
Mean of right answers on knowledge (n=12)	6.5	10.5		-10.89**
Percentage of right answers on knowledge (%)	54	88	33	

Adoption of certified seeds and three reductions three gains before and after participation in community-based farmer groups:

Among farmers who joined community-based farmer groups with same prefence, farmer adoption rates of certified seeds (9% in Go Cong Tay district and 21% in Co Do district) and three reductions three gains (19% in Go Cong Tay district and 22% in Co Do district) were low before training. After training and visiting demonstration field, the adoption rates of certified seeds ncreased 38% in Go Cong Tay district and 36% in Co Do district. Similarly, adoption rates of three reductions three gains increased 34% in Go Cong Tay district and 22% in Co Do district.

In both districts, adoption rate of certified seeds increased 37% and three reductions three gains increased 28% (Table 4).

Table 4. Adoption rates of certified seeds and three reductions three gains before and after joining community-based farmer group with same preference (% farmers)

Item	Before training	After training	After training, visiting demonstration field	Percentage increased (%)
	Autumn- Winter 2007, Winter-Spring 2007	Autumn-Winter 2008	Winter-Spring 2008	
Go Cong Tay (Tien Giang)				
Certified seeds	9	24	47	38
Three reductions three gains	19	25	53	34
Co Do (Can Tho)				
Certified seeds	21	45	57	36
Three reductions three gains	22	28	44	22
Total				
Certified seeds	15	35	52	37
Three reductions three gains	21	27	49	28

Farmers' cultural practices

Comparison farmers' practices before and after joining community-based farmer groups and tranining showed that the number of pesticide sprays was reduced. After joining community-based farmer groups and training, farmer reduced 1 time of pesticide spraying per crop season in average. Pesticide cost reduce 207.1 thousand dong per hectare. They reduced 13.9 kg N/ha) and increased phosphorus and potasium to balance fertilizer (Table 5).

Table 5. Comparison farmers' practices before and after joining community-based farmer groups and tranining

Item	Before	After	T-value	Difference
Number of insecticide sprays/season	4.3	3.4	3.26**	0.9
Number of fungicide sprays/season	3.8	3.1	3.50**	0.7
Pesticide cost (VND 1,000 / ha)	1975.7	1768.6	1.20^{ns}	207.1
N (kg/ha)	112.5	98.5	2.80**	13.9
P2O5 (kg/ha)	51.6	57.9	2.34*	-6.2
K2O kg/ha)	30.0	43.2	5.12**	-13.2
P (kg/ha) =P_2O_5 x 44%	23	25.5	2.33*	-2.5
K kg/ha)=K_2O x 83%	25	35.9	5.12**	-10.9

* Significantly different at 5%; ** Significantly different at 1%; ns: not significant

Status of using certified seeds and three reductions three gains before and after presence of commnuity-based farmer groups in the whole community of the hamlets where community-based farmer groups established

Census of rice farming households and rice area adopted certified seeds and three reductions three gains in all hamlets before presence of commnuity-based farmer groups in Go Cong Tay district (Tien Giang province) showed that farmer adoption rate of certifed seed was low (3.5% in average), even no adoption in certain hamlet. Similarly, rice area adoption rate of certified seed was also low (6.6% in average). The farmers adoption rate of three reductions three gains was lower (1.9%) and rice area adopted this technology was also low (4%).

Census of rice farming households and rice area adopted certified seeds and three reductions three gains after presence of commnuity-based farmer groups with same preference, training, visiting field demonstration and poster exposure showed that rates of adoption were increased. Farmer adoption rate of certified seed was 30.6% and area adoption rate was 49.2%. Thus, the farmer adoption rate increased 27.1% and rice area adoption rate increased 12.2% when compared with those before presence of community-based farmer groups.

After presence of commnuity-based farmer groups with same preference, training, visiting field demonstration and poster exposure, farmer adoption rate of three reductions three gains was 14.2% (increased 42.6%) and rice area adoption rate was 25.5% (increased 21.5% as compared with before) (Table 6).

The census also showed that before presence of commnuity-based farmer groups in Co Do district district (Can Tho city), farmer adoption rate of certifed seed was low (4.1%), and rice area adoption rate was only 3.8% in average. Farmer adoption rate of three reductions three gains was 4.4% and rice area adoption rate was only 5%.

After presence of commnuity-based farmer groups with same preference, training, visiting field demonstration and poster exposure, the census showed that farmer adoption rate of certifed seed was 55.5% (increased 51.4%) and three reductions three gains was 37% (increased 32.7% as compared with before presence of commnuity-based farmer groups).

Rice area adoption rate of certified seed was 56.1% (increased 52.3%) and three reductions

three gains was 39% (increased 34% as compared with before presence of community-based farmer group with same preference) (Table 7).

Analysis of both sites (Go Cong Tay district- Tien Giang province and Co Do district- Can Tho city), after presence of community-based farmer groups with same preference, training, visiting demonstration field and poster exposure, the farmer adoption rate of certified seed increased 34.4%, rice area sown certified seeds increased 49.2%. The rate of farmer adopted three reductions three gains increased 18.4% and rice area applied this technology increased 30.2% (Table 8).

Table 6. Percentage of rice area and farmers using certified seeds and practicing three reductions three gains before and after presence of community-based farmer groups in the whole hamlet in Go Cong Tay district (Tien Giang province)

Commune	Hamlet	Rice area (ha)	Rice farming household	Before [a]				After [b]			
				Farmer adoption rate (%)		Rate of rice area adopted (%)		Farmer adoption rate (%)		Rate of rice area adopted (%)	
				CS	3R3G	CS	3R3G	CS	3R3G	CS	3R3G
Long Binh	Phu Trung	175	384	0	0	0	0	38.0	18.2	59.7	34.5
	Khuong Ninh	73	353	0.6	0	0.3	0	14.2	10.8	38.4	31.3
Long Vinh	Thoi An B	99	274	4.7	1.1	6.5	1.6	17.5	8.4	31.2	14.4
	Vinh Quoi	105	357	4.8	3.6	8.1	6.4	23.2	10.6	46.1	21.1
Dong Thạnh	Thạnh Hung	123	351	4.6	0	5.9	0	24.2	5.1	28.2	7.4
	Hoa Thạnh	134	284	8.1	8.5	12.9	13.4	70.8	34.2	76.5	38.5
	Total	709	2003	3.5	1.9	6.6	4.0	30.6	14.2	49.2	25.5

Table 6. continue

Commune	Hamlet	Rice area (ha)	Rice farming household	Percentage increased (%)			
				Farmer adoption rate (%)		Rate of rice area adopted (%)	
				CS	3R3G	CS	3R3G
Long Binh	Phu Trung	175	384	38.0	18.2	59.7	34.5
	Khuong Ninh	73	353	13.6	10.8	38.2	31.3
Long Vinh	Thoi An B	99	274	12.8	7.7	20.2	12.8
	Vinh Quoi	105	357	18.5	7.0	35.3	12.7
Dong Thạnh	Thạnh Hung	123	351	19.7	5.1	22.3	7.4
	Hoa Thạnh	134	284	62.7	25.7	63.7	25.1
	Total	709	2003	27.1	12.2	42.6	21.5

[a] Census before Autumn- Winter 2008; [b] Census after Winter-Spring 2009;
3R3G: three reductions three gains; CS: certified seed

Table 7. Percentage of rice area and farmers using certified seeds and practicing three reductions three gains before and after presence of community-based farmer groups in the whole hamlet in Co Do district (Can Tho city)

Commune	Hamlet	Rice area (ha)	Rice farming household	Before [a]				After [b]			
				Farmer adoption rate (%)		Rate of rice area adopted (%)		Farmer adoption rate (%)		Rate of rice area adopted (%)	
				CS	3R3G	CS	3R3G	CS	3R3G	CS	3R3G
Truong Xuan A	Trung Thanh	271.5	132	4.3	2.0	4.3	1.9	23.5	22.7	17.1	34.5
	Truong Ninh 1	375.4	302	2.5	3.0	0.6	0.7	49.7	39.7	51.9	43.2
Truong Xuan	Thoi Thanh	173.3	133	4.3	5.7	4.3	5.7	68.4	49.6	70.7	53.6
	Thoi Nhung	104.4	94	3.7	6.5	3.7	6.5	84.0	48.9	89.3	68.7
Dong Binh	Dong Giang	198.5	123	3.7	6.0	3.7	6.0	48.0	16.3	59.4	23.7
	Dong Giang A	156.07	83	6.1	3.1	6.1	9.2	85.5	47.0	91.3	50.9
	Total	1279.17	867	4.1	4.4	3.8	5.0	55.5	37.0	56.1	39.0

Table 7. continue

Commune	Hamlet	Rice area (ha)	Rice farming household	Percentage increased (%)			
				Farmer adoption rate (%)		Rate of rice area adopted (%)	
				CS	3R3G	CS	3R3G
Truong Xuan A	Trung Thanh	271.5	132	19.2	20.8	12.8	32.5
	Truong Ninh 1	375.4	302	47.2	36.7	51.4	42.5
Truong Xuan	Thoi Thanh	173.3	133	64.2	43.9	66.4	47.9
	Thoi Nhung	104.4	94	80.4	42.5	85.6	62.2
Dong Binh	Dong Giang	198.5	123	44.2	10.3	55.7	17.7
	Dong Giang A	156.07	83	79.4	43.9	85.2	41.7
	Total	1279.17	867	51.4	32.7	52.3	34.0

[a] Census before Autumn- Winter 2008; [b] Census after Winter-Spring 2009;
3R3G: three reductions three gains; CS: certified seed

Table 8. Farmer and rice area rates adopted certified seeds and three reduction three gains in both Go Cong Tay and Co Do districts

Item	Certified seed	Three reductions three gains	Rate (%)	
			Certified seed	Three reductions three gains
Total farmers adopted				
Before	106	78	3.7	2.7
After	1094	605	38.1	21.1
Percentage increased			34.4	18.4
Rice area adopted (ha)				
Before	88.9	79.0	4.5	4.0
After	1066.7	679.1	53.7	34.2
Percentage increased			49.2	30.2

Rice area of two sites (Go Cong Tay and Co Do districts): 1988,17 ha
Total rice farming households in two sites (Go Cong Tay and Co Do districts): 2870 households
Analysis from census data in two sites (Go Cong Tay and Co Do districts)

CONCLUSION

Development of community-based famer groups with same prefence, strenthening the groups by training, visting demonstration fields and discusion together with poster exposure in the remote rice farming area increased farmer adoption rate and rice area adoption rate of certified seeds and three reductions three gains.

Farmers' proper perception on certified seeds and three reductions three gains increased 49% and their knowledge on certified seeds increased 39% and on three reductions three gains 33% as compared with no community-based famer groups with same prefence, training and visting demonstration fields, discusion and poster exposure. Among farmer members of the groups, farmer adoption rate of certified seeds increased 37% and three reduction three gains 28%.

In the community, census of the whole hamlets with presence of community-based famer groups with same prefence, the adoption of these technologies was widely spread in two dstricts. Rice area sown with certified seeds increased 49.2% and applied three reductions three gains increased 30.2% as compared with no community-based famer groups with same prefence, training and visting demonstration fields, discusion and poster exposure. Similarly, farmer adoption rate of certified seeds increased 34.4% and three reductions three gains increased 18.4%.

Participation in public association as development of community-based farmer groups with same preference can increase farmers' technical knowledge, learning each other, exchange of experience, and then increase innovation adoption. Thus, there is the need of support policy in development of community-based farmer groups with same preference for wide spread of advance innovation in rural area.

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Hiệu quả của nhóm cộng đồng nông dân cùng sở thích trong áp dụng tiến bộ kỹ thuật

Phát triển nhóm cộng đồng nông dân cùng sở thích và củng cố nhóm bằng tập huấn, thăm ruộng trình diễn, thảo luận và treo áp phích ở các ấp vùng sâu làm tăng tỷ lệ nông dân và tỷ lệ diện tích dùng giống lúa xác nhận và áp dụng biện pháp ba giảm ba tăng. Nhận thức của nông dân về giống lúa xác nhận và ba giảm ba tăng gia tăng 49%. Kiến thức về giống lúa xác nhận tăng 39% và ba giảm ba tăng tăng 33% so với khi chưa thành lập nhóm cộng đồng nông dân cùng sở thích. Thống kê toàn các ấp vùng sâu có hiện diện nhóm cộng đồng nông dân cùng sở thích cho thấy sự dùng giống lúa xác nhận và áp dụng biện pháp ba giảm ba tăng đã lan rộng ra cộng đồng. Trong cộng đồng, tỷ lệ diện tích dùng giống lúa xác nhận tăng 49,2% và ba giảm ba tăng tăng 30,2%. Tỷ lệ nông dân áp dụng giống lúa xác nhận tăng 34.4% và ba giảm ba tăng tăng18,4%. Vì vậy, cần có chính sách hỗ trợ cho sự phát triển, nhân rộng nhóm cộng đồng nông dân cùng sở thích để gia tăng sự áp dụng rộng rãi các tiến bộ kỹ thuật ở nông thôn.