ROLE OF COOPERATIVE IN ENCOURAGING THE IMPLEMENTATION OF GOOD AGRICULTURAL PRACTICES AND FARMERS' INCOME IMPROVEMENT IN INDONESIA

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Introduction

- The excessively land exploitation that characterized by overusing of inorganic fertilizers and chemical continuously in an effort to increase national rice production caused the degradation of many farmland quality
- Aware of this problem, the Government of Bali Province since 2009 has implemented the Integrated Farming System (Simantri) Program, which encourages the establishment of agricultural cooperatives at every its location development.
- One of these is Andini Cooperative. The presence of co-operative is expected to has an important role in encouraging farmers to apply GAP
- It is, therefore, to be very interesting to assess the role of cooperatives to encourage farmers to implement GAP and CLS approaches and improve farmers' income.
- At broader context (macro perspective), it is also interesting to examine its impact on inorganic fertilizer subsidy and foreign exchange savings, as well as on strengthening of food security.

History The Andini Cooperative Development

Item	Year 2009	2010	2011	2012	r (%/y)
Number of Member (person)	106	145	251	303	43.54
Capital Accumulation (Rp Million)	60.5	173	339	462.5	106.11
Types of Business Activity	Produces and Sells organic fertilizer Produces and Sells bio-urine fertilizer Sells inorganic fertilizer	Produces and Sells organic fertilizer Produces and Sells bio-urine fertilizer Sells inorganic fertilizer Provides Credit	Produces and Sells organic fertilizer Produces and Sells bio-urine fertilizer Sells inorganic fertilizer Provides Credit Buys and Sells agricultural products Mills paddy to rice	Produces and Sells organic fertilizer Produces and Sells bio-urine fertilizer Sells inorganic fertilizer Provides Credit Buys and Sells agricultural products Mills paddy to rice	

ROLE OF COOPERATIVE IN PROMOTING GOOD AGRICULTURAL PRACTICES

Comparative Input Production Use in Rice Farm Between Andini Cooperative Farmer and Non-Andini Cooperative Farmer, Tabanan District-Bali, 2012.

Item	Cooperative (A)	Non-Cooperative (B)	Difference (A)-(B)	Difference {(A-B)/B}*100
A. Inorganic Fertilizer				
1. Nitrogen	152	313	-161	-51.44
2. Super Phosphate	75	152	-77	-50.66
3. Potassium Chloride	72	150	-78	-52.00
B. Organic Fertilizer	1322	250	1072	428.80
C. Chemical				
1. Solid	0.12	1.5	-1.38	-92.00
2. Liquid	0.35	2.3	-1.95	-84.78
D. Labor	145	132	13	9.85
E. Number of Farmer Applying Organic Fertilizer	95.6	15.7	79.9	508.92
F. Number of Farmers Applying IPM	85.35	5.25	80.1	1525.71

Comparative Inorganic Fertilizer Uses Between CLS Farmer and Non-CLS Farmer By Agro-Ecosystem in Tanana-Bali, Indonesia, 2012 (kg/ha).

Item	Agro-ecosystem: Irrigated Land	Rainfed Land	Dry Land	Aggregate
1. Non-CLS Farmer				
a. Nitrogen	278.50	264.83	200.33	247.89
b. Super-Phosphate	106.50	88.83	46.67	80.67
c. Potassium Chloride	104.50	87.67	41.67	77.94
Total	489.50	441.33	288.67	406.50
2. CLS Farmer				
a. Nitrogen	168.50	181.33	126.67	158.83
b. Super-Phosphate	70.50	60.83	16.67	49.33
c. Potassium Chloride	56.50	43.50	11.67	37.22
Total	295.50	285.67	155.00	245.39
3. Difference (%)				
a. Nitrogen	-39.50	-31.53	-36.77	-35.93
b. Super-Phosphate	-33.80	-31.52	-64.29	-38.84
c. Potassium Chloride	-45.93	-50.38	-72.00	-52.25
Total	-39.63	-35.27	-46.30	-39.63

Impact of Andini Cooperative on Production Cost Structure on Rice Farm, Tabanan District-Bali, Indonesia, 2012.

Item	Cooperative Quantity (A)	%	Non-Cooperative Quantity (B)	%	Difference {(A-B)/B*100}
A. Inorganic Fertilizer	621600	5.66	1374606	12.06	-54.78
1. Nitrogen	273600	2.49	601586	5.32	-54.52
2. Super-Phosphate	150000	1.37	324520	2.87	-53.78
3. Potassium Chloride	198000	1.80	448500	3.96	-55.85
B. Organic Fertilizer	661000	6.02	141250	1.25	367.96
C. Chemical	9955.84	0.09	76747.5	0.67	-87.03
1. Solid	1380.84	0.01	17580	0.16	-92.15
2. Liquid	8575	0.08	59167.5	0.52	-85.51
D. Labor	7250000	66.04	6600000	58.32	9.85
E. Others	2435550	22.19	3125100	27.61	-22.06
Total	10978105	100.00	11317704	100.00	-3.00

COOPERATIVE IMPACT ON INPUT AND PRODUCT PRICES

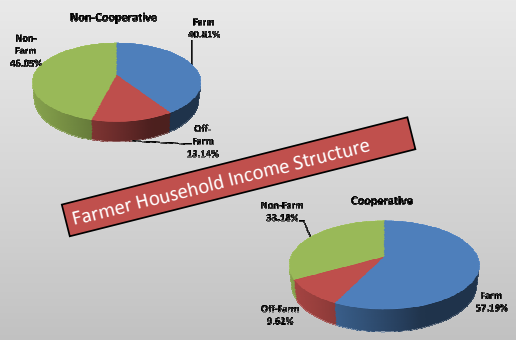
Item	Cooperative (A)	Non-Cooperative (B)	Difference Quantity	Difference {(A-B)/B*100}
I. Input Prices				
a. Inorganic Fertilizer				
1. Nitrogen	1800	1922	-122	-6.35
2. Super-Phosphate	2000	2135	-135	-6.32
3. Potassium Chloride	2750	2990	-240	-8.03
b. Organic Fertilizer	500	565	-65	-11.50
c. Chemical				
1. Solid	11507	11720	-213	-1.82
2. Liquid	24500	25725	-1225	-4.76
d. Labor	50000	50000	0	0.00
II. Output Prices				
a. Rice	3425	3250	175	5.38
b. Corn	2418	2300	118	5.13

Impact of GAP on Rice Productivity and Farmers' Income

Item	Cooperative (A)	Non-Cooperative (B)	Difference {(A-B)/B*100}
1. Productivity	5954	4781	24.53
2. Revenue	20392450	15538250	31.24
3. Profit (Income)	9414344	4220547	123.06
4. RCR	1.86	1.37	35.30

Comparative Revenue, Cost and Profit Between CLS Famers and Non-CLS Farmers by Agro-ecosystem in Tabanan District-Bali, Indonesia, 2012 (Rp 000/ha/year)

Item	Non-CLS Crops	Non-CLS Cattle	Non-CLS Total	CLS Crops	CLS Cattle	CLS Total
1. Irrigated Land						
a. Revenue	16665	27275	46971	18115 (8,70)	28701 (5,23)	50005 (6,46)
b. Cost Production	8458	25523	37012	8068	26235	37492
c. Revenue	8208	1752	9960	10048 (22,42)	2466 (40,75)	12514 (25,64)
d. RCR	1.97	1.07	1.27	2.25	1.09	1.33
2. Rainfed Land						
a. Revenue	13532	25392	38924	14352 (6,06)	27162 (6,97)	41514 (6,65)
b. Cost Production	7246	23486	30733	6936	24407	31696
c. Revenue	6286	1906	8191	7417 (17,99)	2755 (44,58)	9819 (19,87)
d. RCR	1.87	1.08	1.27	2.07	1.11	1.31
3. Dry Land						
a. Revenue	9756	26982	36738	10050 (3,02)	28338 (5,03)	38388 (4,49)
b. Cost Production	6300	25008	31308	5912	24936	30848
c. Revenue	3456	1974	5430	4138 (19,75)	3402 (72,34)	7540 (38,87)
d. RCR	1.55	1.08	1.17	1.70	1.14	1.24



ROLE OF COOPERATIVE IN MACRO PERSPECTIVE

Food Security Strengthening

Year	Potential Additional of Production Available (ton) Rice	Beef
2012	2.543.223	71.972
2013	2.595.081	73.187
2014	2.624.773	78.563
2015	2.749.111	80.763

ROLE OF COOPERATIVE IN MACRO PERSPECTIVE

Fertilizer Subsidy and Foreign Exchange Savings

Item	Year 2012	2013	2014
1. Savings on Fertilizer Subsidy (Rp Billion)	400.56	421.89	442.99
a. Nitrogen			
Quantity (000 ton)	950.13	997.64	1047.53
Value (Rp Billion)	285.04	299.29	314.26
b. Super-Phosphate			
Quantity (000 ton)	385.05	408.67	429.11
Value (Rp Billion)	115.52	122.60	128.73
2. Savings on Foreign Exchange (Rp Billion)	7519.3	7748.03	8093.41
a. Imported Potassium Chloride			
Quantity (000 ton)	411.07	432.71	454.35
Value (Rp Billion)	636.55	670.08	703.58
b. Imported Rice			
Quantity (000 ton)	2595.08	2624.77	2749.11
Value (Rp Billion)	5802.60	5868.99	6147.01
c. Imported Beef			
Quantity (000 ton)	70.19	78.56	80.76
Value (Rp Billion)	1080.15	1208.96	1242.82
Total (Rp Billion)	7919.86	8169.92	8536.4

Conclusions and Policy Implications

- ✓ The emerging of Andini Cooperative has brought about the positive changes on improvement of society prosperity and environment quality.
- ✓ At micro perspective, implementation of GAP and CLS obtained higher productivity and earned better income to farmers than that of existing practices. Cooperative also brought about the agricultural sector to be as the main source of farmer household income.
- ✓ At macro perspective, it could save fertilizer subsidies and foreign exchange, strengthened food security, as well as provided more employment opportunity for local people .
- ✓ it is needed the favorable policies to encourage agricultural cooperatives establishment massively in other locations.