

# Production, Credit and Marketing Schemes of Farms in ARIP I, BARIS, and MCIS, South Cotabato

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## Abstract

A study on the production, credit, and marketing schemes of farms in the Allah River Irrigation Project I (ARIP I), Banga River Irrigation System (BARIS), and Mani Communal Irrigation System (MCIS) was conducted during the 1986/87 and 1987/88 dry seasons.

Comparative profitability of the different farms varied. In BARIS, irrigated hybrid corn was equally as profitable as rice while in MCIS, irrigated hybrid corn was not as profitable as rice. Irrigated farms planted to hybrid and native corn yielded more resulting in more profit compared to rainfed corn farms.

Irrigation of corn in ARIP I did not perform well. Growing irrigated hybrid corn was not as profitable as growing rice; irrigated and rainfed corn did not also differ in performance.

Labor requirement in corn farms was equal with farms planted to direct-seeded rice. Availability of labor for all farm operations in rice and corn farms under the three irrigation systems was not a problem.

Generally, farmers obtained credit from non-formal credit institutions like neighbors, friends and local traders who usually charge high interest rates.

Production-related problems common to the farmers under the three irrigation systems were inadequacy of water supply, lack of capital, high interest rates for loans, low farmgate prices, and lack of transport facilities.

If adequate price incentives are available, irrigated hybrid corn can be as profitable as rice. Other non-rice crops may be adopted by farmers if the farmers are familiar with the cultural management of the crop and are assured of its market at a reasonable price.

## Introduction

Decreasing water supply is one of the pressing problems in irrigation systems nowadays. Three irrigation systems in South Cotabato, namely, the Allah River Irrigation Project I (ARIP I), Banga River Irrigation System (BARIS) and the Mani Communal Irrigation Systems (MCIS) are faced with this problem especially during the dry season. To alleviate this problem, the management programmed some portions of the service area to be planted to diversified crops, particularly corn.

The economics of crop diversification under these irrigation systems was the focus of this study. Economic parameters studied were profitability, credit and marketing of corn compared with rice. The study was envisioned to provide benchmark information for related studies on crop diversification in irrigated rice-based systems.

The study was conducted to:

1. Compare the profitability of different farms under the three irrigation systems;
2. Determine the labor requirement and its availability for the different farm operations;
3. Identify the factors that influence decision-making among farmers;
4. Identify farmers' sources and amount of credit and marketing practices; and
5. Identify the problems encountered by farmers.

## Methodology

Farmers covered by the service areas of the three irrigation systems were interviewed using a questionnaire interview schedule. Farmers under

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ARIP I and BARIS were interviewed during 1986/87 and 1987/88 dry seasons. However, farmers-under MCIS were interviewed during the 1986/87 dry season only due to rehabilitation activities in the system.

Respondent farmers were randomly sampled from each area. A total of **255** farmers were interviewed during the 1986/87 dry season 100 farmers under ARIP; **50** rice farmers, **50** irrigated (seepage) corn farmers, and **50** rainfed corn farmers under BARIS; and **35** rice farmers, **35** irrigated (seepage) corn farmers, and **35** rainfed corn farmers under MCIS.

On the other hand, **354** farmers were interviewed during the 1987/88 dry season: 173 farmers under ARIP (**84** rice farmers, 18 with irrigated [seepage] corn farms, **40** with rainfed [land converted] corn farms and 31 with rainfed corn farms); and 181 farmers under BARIS (**84** rice farmers, **34** with irrigated [seepage] corn farms and **63** with rainfed corn farms).

All rice farms covered in the study were irrigated while the rainfed corn farms were farms within the vicinity of the service area which were dependent on rainfall. Irrigated (seepage) corn farms were farms within the service areas of the irrigation systems which used water which seeped-out from nearby irrigation canals and adjacent irrigated farms. Irrigated (seepage) corn farms were considered as irrigated in the study. Converted rainfed corn farms under ARIP I were farms planted to corn after irrigated rice.

Data gathered were analyzed using frequencies, percentages and comparison of means through the t-test.

Farm profitability was estimated based on gross returns (GR) using the formula:

$$GR = \sum_{i=1}^n P_i X_i$$

where:  $n$  = number of production outlets.  
 $P_i$  = unit price of product disposed to the  $i$ th outlet, and  
 $X_i$  = quantity of product disposed to the  $i$ th outlet.

GR is defined as the total value of a farmer's product valued at the time when the farmer disposes it. Harvester's and thresher's shares were considered as wet/fresh paddy since the farmer disposed it as undried harvest while paddy sold or used for consumption were considered dry.

Returns above variable cost (RAVC) was estimated as:

$$RAVC = GR - (MC + LPC)$$

where: GR = gross returns,  
 MC = material cost, and  
 LPC = labor and power cost.

## Results and Discussion

### Allah River Irrigation Project I

Demographic characteristics. Generally, farmers under **ARIP I** were **40** to **47** years of age, male, married and with **20** to **24** years farming experience. Most farmers were able to finish at least grade six or at most second year high school. Their household consisted of the farmer himself, his wife and four to seven children. Farming served as their main source of livelihood.

Land holdings and utilization. Average farm size of farmers under ARIP I ranged from 1.10 to 1.74 hectares (Table 1). Farmers either owned or worked as tenants in the farm. Most farmers owned the land they tilled except those who tilled rainfed corn farms who were mostly tenants. Rainfed corn farms were laterally distributed, i.e., located at the middle or tail end of laterals A-I, **A-2**, **A-3**, A-3a and A-extra. Irrigation water supply to these lateral areas was cut-off during the 1987/88 dry season. Majority of the farmers planted their crops on time.

Generally, an ARIP I farm was 97% planted during the wet season, and about 96-99% during the dry season. It was observed that irrigated corn farms were more utilized during the dry season than during the wet season. Under-utilization of irrigated corn farms during the wet season imply a need for levelling before the area can be fully irrigated. Since irrigated corn farms were planted to rice during the wet season, the whole area was not fully utilized. During the dry season, the whole area can be planted to corn, including high portions of the farm. Cropping patterns from 1985 to 1988 are shown in Table 2.

The main factors considered by farmers in selecting their farm size was the ability to maximize the use of the available area (Table 3). Other factors considered were availability of water, capital and credit facilities.

Farmers chose rice as a crop due to the availability of water, for family/home consumption and perceived higher economic returns (Table 4). The choice of corn as crop among farmers was determined on the pretext that ample irrigation

**Table 1.** Land holdings of farmers under ARIP I, 1986/87 and 1987/88 dry seasons.

Characteristics of Land Holdings	1986/87		1987/88		
	Irrigated Rice	Irrigated Rice	Irrigated Corn	Rainfed Corn (converted)	Rainfed Corn
<b>Farm area (ha)</b>	1.65	1.69	<b>1.10</b>	<b>1.15</b>	<b>1.74</b>
<b>Tenure (%)</b>					
Owned	<b>44</b>	42	56	35	42
Tenanted	<b>38</b>	36	39	50	39
Leased	<b>8</b>	19		<b>15</b>	13
Others	10	3	5		6
<b>Lateral location (%)</b>					
A	40	28			
A-I				2	13
A-2			33	5	<b>10</b>
A-3			33	28	26
A-3a			<b>11</b>	65	26
A-extra			23		<b>19</b>
B	<b>11</b>	<b>14</b>			
C	13	13			
D	6				
<b>E</b>	<b>7</b>	<b>14</b>			
Main canal	23	31			
<b>Location within lateral (%)</b>					
Head	16	33			13
Middle	59	33	56	22	45
Tail	25	33	44	78	42
<b>No. of parcels (%)</b>					
One	64	<b>88</b>	22	80	73
Two	30	9	61	18	<b>18</b>
Three or more	<b>ti</b>	3	<b>17</b>	2	9
<b>Land utilization(%)</b>	<b>96</b>	98	<b>100</b>	99	
<b>Time of planting (%)</b>					
Early	27		5	12	
<b>On Time</b>	<b>ti5</b>	81	90	67	
<b>Late</b>	<b>8</b>				

water is available. Corn farmers said they preferred to plant rice if there was enough water to irrigate their farms based on the following reasons: short cropping period of corn and high costs of seeds and other inputs especially for hybrid corn.

Farmers were unable to irrigate their farms because of the scheduled water cut-off in some laterals of ARIP I. Moreover, some farms were located at higher elevation which were difficult to

irrigate. Farmers whose farms were earlier planted to irrigated rice, considered the residual moisture as sufficient to grow corn even without irrigation.

**Profitability and labor requirement.** During the 1987/88 dry season irrigated rice farms were the most profitable among the farms in ARIP I (Tables 5, 6a and 6b). Gross returns and returns above variable cost of rice farms were higher than irrigated farms planted to hybrid and native corn

*Table 2.* Cropping patterns of farmers under ARIP I, 1985 to 1988.

Type of Farm	1985/86			1986/87			1987/88		
	Wet	Dry	%	Wet	Dry	%	Wet	Dry	%
Irrigated Rice	ir	ir	<b>58</b>	ir	ir	93	ir	ir	99
	<b>rr</b>	<b>rr</b>	<b>11</b>	<b>rr</b>	<b>rr</b>	<b>5</b>	ir/rc	ir	1
	<b>rc</b>	<b>rr</b>	6	rc/ir	<b>rc/rc</b>	2			
	rc	rc	12						
	<b>rc</b>	ir	4						
	others		3						
Rainfed Corn (Converted)	<b>rc</b>	rc	62	ir	rc	<b>40</b>	ir	rc	<b>15</b>
	ic	rc	10	ir	ir	28	ir	rc	75
	ir	ir	15	rc	rc	8	irc	<b>rc</b>	<b>5</b>
	<b>rc</b>	f	<b>5</b>	irc	f	<b>5</b>	ir	irc	<b>5</b>
	irc	irc	2	others		19			
	ir	rrc	2						
	others		<b>4</b>						
Seepage Corn	sc	<b>sc</b>	<b>8</b>	sc	sc	13	ir	sc	100
	ir	ir	38	ir	ir	<b>44</b>			
	rc	rc	46	ir	rc	12			
	fallow		8	rc	rc	31			
Rainfed Corn	<b>rc</b>	rc	<b>81</b>	ir/rc	ir/rc	<b>13</b>	ir/rc	ir/rc	19
	ir	ir	6	<b>rc</b>	rc	65	rc	rc	<b>55</b>
	rc/rc	ir/rc	6	ir	ir	6	others		<b>26</b>
	others		6	others		16			

Legend: ir - irrigated rice      irc - irrigated rice+corn  
rr- rainfed rice      rrc - rainfed rice+corn  
rc- rainfed corn      sc- seepage corn

*Table 3.* Factors considered by farmers under ARIP I in determining farm size, 1986/87 and 1987/88 dry seasons.

Factors	Rank				
	1986/87	1987/88			
	Irrigated Rice	Irrigated Rice	Irrigated Corn	Rainfed Corn (converted)	Rainfed Corn
Maximization of available area	1		1	2	2
Availability of water	2	1			
Ease of management	3				3
Availability of capital and credit			2	1	1
Availability of labor			3	3	
Risk involved in growing the crop		2			
Market demand of crop		3			

**Table 4.** Factors considered by farmers under ARIP I in determining what crop to plant, 1986/87 and 1987/88 dry seasons.

Factors	Rank				
	1986/87	1987/88			
	Irrigated Rice	Irrigated Rice	Irrigated Corn	Rainfed Corn (converted)	Rainfed corn
Availability of water	1	1	1	1	1
For family home consumption	2	2			
High returns perceived	3	3			
Less production expenses				2	
Shorter cropping Season			2	3	
Availability of seeds and other inputs			3		3
Climatic condition					2

**Table 5.** Mean yield, cost and returns of farms under ARIP I, 1986/87 and 1987/88 dry seasons

	1986/87		1987/88					
	Irrigated Rice	Irrigated Rice	Irrigated Corn		Rainfed Corn (Converted)		Rainfed Corn	
			Hybrid	Native	Hybrid	Native	Hybrid	Native
No. of samples	100	84	9	9	23	17	9	24
Ave. farm size (ha)	1.65	1.69	1.17	1.02	1.10	1.22	1.54	1.81
Yield (kg/ha)	4400	4016	3503	2283	3724	2870	2741	1748
Total family labor (md, mad, mmd) <sup>a</sup>	38	40	36	62	36	42	22	31
Gross returns (₱/ha)	10905	11936	7128	4339	7280	6272	5841	3998
Labor and power cost (₱/ha)	2569	2632	1450	648	1456	854	1262	746
Material cost (₱/ha)	2315	2184	2390	1203	2307	1106	2587	1065
Total variable cost (₱/ha)	4884	4816	3840	1851	3763	1960	3848	1812
Returns above variable cost (₱/ha)	6021	7120	3288	2488	3517	4312	1993	2187

<sup>a</sup>md - man-days

mad - man-animaldays

mmd - man-machinedays

**Table 6a.** Comparison between yield, cost of production and returns above variable cost of irrigated (IR) and rainfed (RF) crops in ARIP I, 1987/88 dry season.

	Difference					
	IR Rice versus IR Hybrid corn	IR Rice versus IR Native corn	IR Hybrid corn versus IR Native corn	IR Hybrid corn versus RF Hybrid corn	IR Native corn versus RF Native corn	IR Hybrid corn versus RF Hybrid corn (converted )
Yield (kg/ha)	313	1733	1420 *	962 *	535 ns	- 22 ns
Total family labor (md,mad,mmd)	3.6 ns	-22.4"	- 26.0 **	13.7 ns	30.6 **	- 0.3 ns
Gross returns (₱/ha)	4808 **	7597 **	2789 *	1287 ns	341 ns	- 153 ns
Labor and power costs (₱/ha)	1182 **	1984 **	802 **	188 ns	- 98 ns	- 7 ns
Material cost (₱/ha)	- 206 ns	981 **	1187 **	- 197 ns	138 ns.	83 ns
Total variable cost (₱/ha)	976 *	2965 **	1988 **	- 9 ns	40 ns	76 ns
Returns above variable cost (₱/ha)	3832 **	4632 **	800 ns	1296 ns	301 ns	- 229 ns
"md - man-days mad - man-animal-days mmd - man-machine days						
** significant at 1% • significant at 5% ns not significant						

**Table 6b.** Comparison between yield, cost of production, and returns above variable cost of irrigated (IR) and rainfed (RF) crops in ARIP I, 1987/88 dry season.

	Difference				
	IR Native corn versus RF Native corn (converted)	RF Hybrid corn versus RF Native corn (converted)	RF Native corn versus RF Native corn (converted)	RF Hybrid corn (converted) vs. RF Native corn (converted)	IR Rice (1986/87) vs. IR Rice (1987/88)
Yield (kg/ha)	870 ns	- 984 ns	- 1122 •	855 ns	384 *
Total family labor (md, mad,mmd)	19.7 *	- 14.0	10.9 ns	- 6.0 ns	- 1.1 ns
Gross returns (₱/ha)	- 1933 ns	- 1439 ns	- 2214 ns	1008 ns	- 1031 *
Labor and power costs (₱/ha)	- 206 ns	- 195 ns	- 108 ns	602 *	- 63 ns
Material cost (₱/ha)	98 ns	280 ns	- 40 ns	1201 **	301 **
Total variable cost (₱/ha)	- 109 ns	85 ns	- 148 ns	1803 **	238 ns
Returns above variable cost (₱/ha)	- 1825 ns	- 1525 ns	- 2126 ns	- 795 ns	- 1269 **
°md - man-days mad - man-animal-days mmd - man-machine days					
** significant at 1% * significant at 5% ns not significant					

**Table 7.** Labor requirement per hectare of farms under ARIP, **1986/87** and **1987/88** dry seasons.

Type of Labor	1986/87		1987/88		
	Irrigated Rice	Irrigated Rice	Irrigated Corn	Rainfed Corn (converted)	Rainfed Corn
man-days	50.7 ds	52.7 ds	56.2	55.0	52.6
	77.6 tp	75.1 tp		1	
man-animal days	13.8	13.0	11.1	12.1	10.1
man-machine days	5.4	5.1	4.0	3.7	3.5

Legend: ds - direct-seeded (broadcasted)  
tp - transplanted

because farmgate price for paddy was higher than for corn in **1987** and **1988**.

Irrigated (seepage) corn farms did not differ in returns compared to converted rainfed and rainfed corn farms. However, yield and gross returns were higher in irrigated farms planted to hybrid corn than irrigated farms planted to native corn. Returns above variable cost in farms planted to hybrid and native corn did not differ because of the higher production cost of hybrid corn.

Labor required to directly seed rice was less than planting corn; transplanting rice seedlings required more labor (Table 7). Labor required in irrigated and rainfed corn farms were the same. Additional labor was not needed in irrigated corn farms because irrigation water used came from water which seeped-out from nearby irrigated rice farms.

Farmers did not experience labor shortage regardless of what crop they planted (Table 8). The farmer and other members of his family provided the needed farm labor. Other people were hired to augment available family labor during the harvest season.

Production problems of farmers under ARIP I were lack of capital, inadequacy of water supply or rainfall, high cost of inputs and losses due to pests and diseases.

**Marketing.** Farmers under ARIP I dry their produce before selling. However, 64% of the rice farmers sold their produce fresh/wet during the **1987/88** dry season (Table 9). Rice was graded according to moisture content and variety while

corn was graded according to color. Farm produce was sold to local traders.

For the **1987/88** dry season produce corn in cobs was sold at ₱1.51 to ₱1.54/kg, shelled corn which was not dried at ₱2.45 to ₱2.55/kg, and shelled dry corn at ₱3.02 to ₱3.08/kg. On the other hand, dry palay was sold at ₱3.48/kg while paddy, which was not dried, was sold at ₱3.00/kg. Since the farmgate price for palay increased, farm earnings during the **1987/88** dry season planting were higher than that during the **1986/87** dry season planting in spite of the higher yield during the earlier season.

Generally, farmers preferred to sell their produce to credible and accessible buyers as well as those who can provide them credit and can offer them a relatively high price. However, the major marketing problem of farmers under ARIP I was the low farmgate price for the produce. Due to lack of capital, farmers committed their crops as credit collateral resulting in their inability to bargain for a higher market price. Lack of transport facilities and poor roads were also some of the marketing constraints encountered.

**Credit.** During the **1987/88** dry season, 50-68% of ARIP I farmers availed cash loans ranging from ₱2,300 to ₱2,700 per corn farmer and from ₱3,600 to ₱3,900 per rice farmer (Table 10). Although loans were intended to serve as capital, 11-34% of it was utilized for non-agricultural or household purposes. Rice farmers obtained their loans from either their neighbors, friends, local traders or relatives. Corn farmers loaned from

Table 8. Availability of labor as perceived by ARIP I farmers, 1987/88 dry season.

Farm Operations	Response(% of sample size)														
	Irrigated rice					Irrigated corn					Rainfed corn(converted)				
	P	E	F	M	NA	P	E	F	M	NA	P	E	F	M	NA
Clearing the field	28	<b>51</b>	21			7	50	43			33	34	19	<b>5</b>	9
Plowing	33	67				22	33	17			24	16	22		11
Seedbed preparation	36	53	11											11	11
Harrowing	28	<b>71</b>	<b>1</b>			8	67	<b>17</b>	8		9	69	22		6
Irrigating	5	85	<b>10</b>												78
Repair of dikes and canals	19	66	<b>15</b>												
Furrowing						12	<b>56</b>	32			73	27		6	8
Planting/transplanting														58	34
broadcasting	38	62				47	53				13	85	2	37	57
Uprooting and distributing of seedling	22	69	9											6	
Thinning/replanting	34	66													
Fertilizing	24	69	7			6	83	<b>11</b>			3	73	24	4	83
Off-barring						67	33				3	76	21	94	6
Hilling-up						76	24				12	28		<b>87</b>	13
Spraying	31	59	10			83	17				45	<b>55</b>		50	<b>50</b>
Weeding	32	63	<b>5</b>			75	25				50	<b>50</b>		3	<b>87</b>
Harvesting	31	69				89	11				20	80		46	54
Shelling/threshing				100				<b>100</b>					2	98	
Drying & bagging	<b>7</b>	86	7			56	44				58	42		69	31
Hauling	6	8	2	6	<b>5</b>	50	30	20			45	34	3	18	40
Average	24	64	6	6		43	37	8	12		20	46	22	11	1

P - plenty

E -enough

F -few

**M** - available by machine

NA - not available

either chemical dealers, local traders, farmer's cooperative or relatives. Banks were also sources of loans. Among the sources mentioned, friends and relatives charged the highest interest; local traders and farmers cooperative ranked next in that order.

Table 11 shows the factors considered by farmers in ARIP I in choosing their sources of credit. The following were the sources of credit in order of preference: banks, local traders, and neighbors/friends. Banks charged the lowest interest rate among the three major sources.

Twenty-seven to 75% of the farmers availed of credit in kind during the 1986/87 dry season. In-kind credit consisted of fertilizer, seeds and pesticides. Rice farmers also loaned herbicides and fertilizer. Fertilizer occupied the bulk of credit in-kind compared with other farm inputs.

Loan-related problems were high interest rates charged by non-formal credit sources and delayed release of loans from formal credit institutions.



**Table 9.** Marketing practices of farmers under ARIP I, 1986/87 and 1987/88 dry seasons.

Marketing Practices	1986/87	1987/88			
	Irrigated Rice	Irrigated Rice	Irrigated Corn	Rainfed Corn (converted)	Rainfed Corn
<b>Pre-sale practices (%)</b>					
A. drying	11	36	81	100	68
B. product classification according to:					
1. size	0	0	0	38	6
2. moisture content	71	61	87	82	73
3. variety	72	66	87	85	58
4. color	0	0	64	71	61
C. milling	2	1			
<b>Condition of produce (%)</b>					
1. dried palay	69	35			
2. fresh/wet palay	22	64			
3. milled rice/corn	2	1			
4. corn with cobs			28	8	26
5. shelled fresh/wet					3
6. shelled dry			72	92	71
<b>Marketing outlets (%)</b>					
1. local traders	73	98	100	95	96
2. NFA	16				
3. Samahang Nayan/ Farmers cooperative	3	1		5	4
4. Middlemen	2				
5. Other outlets	6	1			
<b>Mode of payment (%)</b>					
1. full cash	96	100	94	98	100
2. installment	2		6	2	
3. check	2				
<b>Distance from farm to outlet (km)</b>					
	4.42	5.08	4.31	5.0	3.54
<b>Mode of sale (%)</b>					
1. delivered	60	44	44	44	52
2. picked-up	40	56	56	55	48
<b>Marketing cost/farm (₱)</b>					
	78.85	79.22	80.75	106.26	40.94

**Table 10.** Credit profile of ARIP I farmers, 1986/87 and 1987/88 dry seasons.

	1986/87	1987/88			
	Irrigated Rice	Irrigated Rice	Irrigated Corn	Rainfed Corn (converted)	Rainfed Corn
<b>Formers who ovoided credit (%)</b>					
1. cash	36	56	<b>50</b>	68	<b>55</b>
2. in kind	<b>24</b>	21	67	75	55
<b>Amount of credit per cropping season (P)</b>					
1. cash	3876	3651	2381	2306	2634
2. in kind	1704	1259	934	2258	2288
<b>Utilization of cash loans (% of total loan)</b>					
1. agricultural purpose	<b>70</b>	72	66	89	72
2. non-agricultural purposes	30	28	34	<b>11</b>	28
<b>Average annual interest</b>					
1. cash loans	3066 (79%)	4667 (129%)	1728 (72%)	1184 <b>(51%)</b>	2136 <b>(81%)</b>
2. in kind	1608 (94%)	148 (12%)	610 <b>(66%)</b>	1306 (57%)	<b>1150</b> <b>(51%)</b>

**Table 11.** Factors considered by ARIP I farmers in their choice for source of credit, 1986/87 and 1987/88 dry seasons.

Factors	Rank				
	1986/87	1987/88			
	Irrigated Rice	Irrigated Rice	Irrigated Corn	Rainfed Corn (converted)	Rainfed Corn
Low interest rates	<b>1</b>	1	1	1	1
Availability of credit	2	2	3	3	
Convenience of availing credit	3	3	2	2	2
Security of loan					3

## Banga River Irrigation System

**Demographic profile.** Majority of the farmers under BARIS were from **44** to 45 years old. Most of them were male, married and with **20** to 22 years of farming experience. Most farmers were able to finish at least grade six or at most, first year high school. Family size ranged from seven to nine. Farming was the *main* source of family income.

**Land holdings and utilization.** Average farm size of farmers under BARIS ranged from 1.21 to 1.60 hectares (Table 12). Farmers were either owners, tenants or leaseholders. Most rice farmers

were leaseholders while most corn farmers whose lands were irrigated by seepage water were tenants. Most **rainfed** corn farms were either tilled by their owner or by tenants. Farms were laterally distributed. During the 1986/87 and 1987/88 dry seasons, however, most irrigated corn farms were found in laterals B, C, and along the main canal.

Like in ARIP I, most farmers under BARIS planted their crops just on time.

BARIS farms were 99 to **100%** planted during the wet season and 97 to **100%** planted during the dry season. Major factors considered by rice farmers in determining the area to be planted were

*Table 12.* Land holdings of farmers under BARIS, 1986/87 and 1987/88 dry seasons.

Characteristics of Land Holdings	Irrigated rice		irrigated corn		Rainfed corn	
	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88
<b>Farm area</b> (ha)	<b>1.60</b>	1.38	1.38	<b>1.21</b>	<b>1.55</b>	<b>1.43</b>
<b>Tenure (%)</b>						
Owned	34	24	30	20	52	29
Tenanted	32	29	40	53	34	53
Leased	34	<b>40</b>	26	20	<b>14</b>	<b>16</b>
Others	0	7	4	7		2
<b>Lateral location (%)</b>						
<b>A</b>	0	5	4		na	na
<b>B</b>	4	18	37	16	na	na
<b>C</b>	14	19	45	68	na	na
<b>D</b>	36	23	2	14	na	na
<b>E</b>	16	<b>14</b>	0		na	na
<b>F</b>	22	20	0		na	na
Main canal	8	<b>1</b>	12	3	na	na
<b>Location within lateral (%)</b>						
Head	34	33	40	22	na	na
Middle	48	33	46	33	na	na
Tail	<b>18</b>	33	14	45	na	na
<b>Number of parcels (%)</b>						
One	80	74	62	<b>53</b>	66	<b>55</b>
Two	18	26	36	41	34	40
Three or more	2	<b>0</b>	2	6	0	<b>5</b>
<b>Land utilization (%)</b>	97	<b>99</b>	98	100		
<b>Time of planting (%)</b>	-					
Early		<b>28</b>		30		31
On time		63		36		45
Late		9		34		24

**Table 13.** Factors considered by farmers under BARIS in determining the size of farm, 1986/87 and 1987/88 dry seasons.

Factors	Rank					
	Irrigated rice		Irrigated corn		Rainfed corn	
	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88
Availability of water supply	1	1	1		1	
Ease of management	2					3
Experience in the previous dry season	3		3		3	
Availability of planting materials and other inputs			2	3	2	2
Market demand of the produce			3	2		
Availability of capital		3				
Maximization of available area		2		1		1

**Table 14.** Factors considered by farmers under BARIS in determining what crop to plant, 1986/87 and 1987/88 dry seasons.

Factors	Rank					
	Irrigated rice		Irrigated corn		Rainfed corn	
	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88
For family home consumption	1	1		2		
Availability of water	2	2	1	1		3
Marketability of the produce	3		3		2	
Familiarity of the farmers in growing the crop			2		1	1
High returns perceived					3	
Suitability of crop		3				2
Ease of management				3		

the availability of water supply and convenience of managing the area (Table 13). Almost the same factors were considered by corn farmers except that their priority consideration was availability of seeds and other inputs.

The choice of rice as a crop among farmers was greatly influenced by their domestic need for rice (Table 14). Choosing between rice and corn, farmers preferred to plant the former if enough water was available.

Farmers under BARIS did not irrigate their farms because: 1. the area was at high elevation; 2.

turnouts was not available; and 3. some farmers relied on seepage irrigation water.

Table 15 shows the cropping patterns employed by farmers under BARIS from 1985-88. Most rice farmers followed the pattern of planting irrigated rice during the wet and dry seasons. Majority of the corn farmers whose farms were either irrigated or rainfed planted corn during both wet and dry seasons.

Table 15. Cropping patterns followed by farmers under BARIS, 1985 to 1988.

Type of Farm	1985/86			1986/87			1987/88		
	Wet	Dry	%	Wet	Dry	%	Wet	Dry	%
Irrigated rice	ir	ir	77	ir	ir	74	ir	ir	99
	ir	sc	7	ir	sc	7	ir	irc	1
	others		16	others		19			
Seepage Corn	sc	sc	62	sc	sc	62	sc	sc	100
	rc	rc	6	rc	rc	6			
	ir	ir	9	ir	ir	24			
	ir	sc	12	others		8			
	others		11						
Rainfed Corn	c	c	81	c	c	84	c	c	92
	rc	rc	3	rc	rc	5	rc	rc	8
	others		16	others		11			

Legend: ir - irrigated rice  
sc - seepage corn  
irc - irrigated rice+corn  
rc - rainfed corn  
c - corn

**Profitability and labor requirement.** Planting irrigated hybrid corn in BARIS was more profitable than rice during the 1986/87 dry season (Tables 16 and 17). Although yields of hybrid corn and rice did not differ, gross returns and returns

above variable cost for irrigated hybrid corn was higher than rice. The relatively high profitability of irrigated hybrid corn over rice was due to higher faringate price of corn coupled with low production cost (Table 18).

Table 16. Mean yield, cost and returns, BARIS, 1986/87 and 1987/88 dry seasons.

Items	1986/87					1987/88				
	Rice	Irrigated Corn		Rainfed Corn		Irrigated Rice	Irrigated Corn		Rainfed Corn	
		Hybrid	Native	Hybrid	Native		Hybrid	Native	Hybrid	Native
No. of samples	50	43	7	34	16	84	34	no	33	30
Ave. farm size (ha)	1.11	1.43	1.11	1.63	1.38	1.38	1.21	entry	1.42	1.46
Yield (kg/ha)	3802	4303	2863	3924	2614	3874	3977		3458	2491
Total family labor (md, mad, mmd) <sup>a</sup>	43	21	38	24	25	48	30		24	30
Gross returns (₱/ha)	8955	10685	6626	8802	5991	11081	9125	„	7086	5308
Labor and power cost (₱/ha)	1022	1087	707	873	601	2566	1642		1639	1047
Material cost (₱/ha)	2297	1774	826	1737	813	2276	2173		2115	1119
Total variable cost (₱/ha)	3299	2862	1532	2610	1415	4848	3815		3754	2166
Returns above variable cost (₱/ha)	5657	7824	5093	6192	4576	6240	5309		3332	3142

<sup>a</sup> md - man-days

mad - man-animal days

mmd - man-machine days

**Table 17.** Comparison between yield, cost of production and returns above variable cost of irrigated (IR) and rainfed (RF) crops in BARIS, 1986/87 dry season.

	Difference				
	IR Rice versus IR Hybrid corn	IR Rice versus IR Native corn	IR Hybrid corn versus IR Native corn	IR Hybrid corn versus RF Hybrid corn	IR Native corn versus RF Hybrid corn
Yield (kg/ha)	- 500 ns	939 *	1439 *	378 ns	249 ns
Total family labor (md, mad, mmd)	23 *	5 ns	• 17 **	- 3 ns	13 ns
Gross returns (₱/ha)	- 1730 *	2330 ns	4060 *	1883 *	634 ns
Labor and power cost (₱/ha)	- 85 ns	296 ns	381 ns	214 ns	105 ns
Material cost (₱/ha)	522 **	1471 *	949 **	38 ns	12 ns
Total variable cost (₱/ha)	431 *	1767 **	1330	252	117 ns
Returns above variable cost (₱/ha)	- 2161 **	563 ns	2730 ns	1632 *	517 ns

\*\* significant at 1%

\* significant at 5%

ns not significant

**Table 18.** Average farmgate price of rice and corn in BARIS, 1986/87 and 1987/88 dry seasons.

	Price (₱/kg)					
	Irrigated rice		Irrigated corn		Rainfed corn	
	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88
Fresh/wet palay	2.34	2.95				
Dried palay	2.86	3.39				
Corn with cobs			1.65	1.53	1.60	1.55
Wet/fresh shelled corn			2.59	2.42	2.45	2.56
Dry shelled corn			3.07	2.95	3.18	3.01

**Table 19.** Comparison between yield, **cost** of production and returns above variable cost, HARIS. 1987/88 dry season.

	Difference	
	Irrigated Rice versus Irrigated Hybrid Corn	Irrigated Hybrid Corn versus Rainfed Hybrid Corn
Yield (kg/ha)	- 123	539 ns
Total family labor (md. mad, mmd)	17 **	7 ns
<b>Gross</b> returns (₱/ha)	1956 *	2038 **
Labor and power cost (₱/ha)	923 **	4 ns
Material cost (₱/ha)	103 ns	58 ns
Total variable cost (₱/ha)	1026 **	61 ns
Returns above variable cost (₱/ha)	930 ns	1977 **

\*\* significant at 1%

\* significant at 5%

ns not significant

During the 1986/87 dry season, irrigated hybrid corn yielded more resulting in higher gross returns than irrigated native corn. However, with the high cost of growing hybrid corn, returns above variable cost did not differ from that of native corn. Similarly, growing of irrigated hybrid corn was more profitable than rainfed hybrid corn. Irrigation did not affect the profitability of growing native varieties.

During 1987/88 dry season, yield of irrigated hybrid corn was higher than rice but gross returns of the latter **was** higher due to a higher farmgate price (Table 19). In the same cropping season, gross returns in irrigated hybrid corn was higher compared to rainfed hybrid corn.

Comparing the performance of BARIS farms between years, it was observed that performance of irrigated hybrid corn was better during the 1986/87 dry season (Table 20). On the other hand, gross returns of irrigated rice farms was higher during the 1987/88 dry season than during the 1986/87 **dry** season. But because of higher cost incurred in 1987/88, the returns above variable cost was not significantly higher than in 1986/87.

The trend of labor requirement for farms in BARIS was similar to that in ARIP I (Table 21).

Farms which directly seeded rice had the same labor requirements with corn farms; farms that transplanted rice had higher labor requirements. Irrigated corn farms had the same labor needs with rainfed farms. No additional labor was used for irrigation since seepage irrigation water was used.

Availability of labor **was** not a problem in all types of farms in BARIS. On the average there was enough labor for all farm operations. The farmer and members of his family provided for the needed farm labor. Hired labor was only used to augment available family labor during the harvest season.

Inadequacy of water was the foremost problem of farmers under BARIS: problems on pests and diseases, high cost of fertilizer and chemicals, and lack of capital follow in that order.

**Marketing.** Farmers under BARIS dry their produce before selling them (Table 22). Farm produce are classified according to moisture content and crop variety before they are sold.

Table 23 shows the factors considered by farmers before they sold their produce. Most farmers sold their produce to a local trader.

**Table 20.** Comparison of yield, cost and returns between years (1986/87 and 1987/88) of irrigated rice and irrigated hybrid corn, ARIP and BARIS.

	ARIP	BARIS	
	Irrigated Rice	Irrigated Rice	Irrigated Corn
Yield (kg/ha)	3x4 *	- 72 ns	305 *
Total family labor (md, mad, mmd)	- 1 ns	- 4 *	- 9 ns
Gross returns (₱/ha)	- 1031 *	- 2125 **	1561 **
Labor and power cost (₱/ha)	- 63 ns	- 1563 **	- 555 *
Material cost (₱/ha)	301 **	21 ns	- 398 **
Total variable cost (₱/ha)	238 ns	- 1542 **	- 954 **
Returns above variable cost (₱/ha)	- 1269 **	583 ns	2514 **

\*\* significant at 1%

\* significant at 5%

ns = not significant

**Table 21.** Labor requirement per hectare, BARIS, 1986/87 and 1987/88 dry seasons.

Type of Labor	Irrigated Rice		Irrigated Corn		Rainfed Corn	
	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88
man-days	54.9-ds 69.6-tp	55.1-ds 77.0-tp	57.4	54.5	52.7	54.8
man-animal days	12.2	10.7	10.9	9.9	9.8	10.0
man-machine days	5.1	5.0	3.7	4.0	3.0	3.6

ds = direct-seeded (broadcasted)

tp = transplanted



**Table 22.** Marketing practices of farmers under BARIS, 1986/87 and 1987/88 dry seasons.

	Irrigated Rice		Irrigated Corn		Rainfed Corn	
	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88
<b><i>Presale practices (%)</i></b>						
Drying	90	62	<b>98</b>	94	<b>80</b>	76
Classification						
Size	<b>0</b>	0	<b>0</b>	0	0	0
Moisture content	<b>100</b>	<b>81</b>	96	95	98	79
Variety	<b>100</b>	16	<b>10</b>	9	<b>18</b>	<b>13</b>
Color	100	0	0	0	82	0
Milling		0		0		0
<b><i>Condition of produce (%)</i></b>						
<del>Dried</del> palay	<b>90</b>	62				
Fresh/wet palay	<b>10</b>	38				
Milled rice/corn	<b>0</b>	0				
Corn with cobs			2	6	20	27
Shelled dry corn			98	94	80	73
<b><i>Marketing outlet (%)</i></b>						
Local traders	79	98	94	94	94	<b>100</b>
NFA	4	2	0	0	0	<b>0</b>
<b>SN</b> & other farmers						
cooperative	17	<b>0</b>	4	0	4	<b>0</b>
Middlemen	0	<b>0</b>	2	0	2	<b>0</b>
Other	0	<b>0</b>	0	SMC-6	0	<b>0</b>
<b><i>Mode of payment</i></b>						
Cash	96	99	<b>100</b>	97	100	92
Installment	2	0	<b>0</b>	0	<b>0</b>	0
Check	2	1	<b>0</b>	3	<b>0</b>	8
<b><i>Distance from farm to market outlet (km)</i></b>						
	4.22	6.55	4.45	12.27	<b>6.78</b>	<b>11.04</b>
<b><i>Mode of selling</i></b>						
Picked-up	52	68	78	59	80	59
Delivered	48	32	22	41	20	41
<b><i>Marketing cost (₱)</i></b>						
	<b>80</b>	<b>41</b>	<b>134</b>	68	55	54

**Table 23.** Factors considered by farmers under BARIS in their choice of marketing outlet, 1986/87 and 1987/88 dry seasons.

Factors	Rank					
	Irrigated Rice		Irrigated Corn		Rainfed Corn	
	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88
Price offered by the buyer	1	1	1	2	2	2
Marketing tie-up	2	2	2	1	1	1
Availability of credit from the buyer		3				
Mode of buying the product				3		
Familiarity and credibility of the buyer	3		3		3	3

Marketing problems encountered by farmers under **BARIS** were similar to those in ARIP 1 (Table 24). Foremost of these problems was the low farmgate price for their produce relative to the price of inputs. Other problems were marketing tie-up, lack of transport facilities and lack of standards. Traders determined the quality of the produce sold without any standard to base their judgement. The *touch and feel* method was used to determine the produce's moisture content.

Credit. Majority of the ~~farmers~~ under **BARIS** availed of cash loans and in-kind credit (Table 25). Corn farmers loaned higher amounts of both cash and credit in-kind compared to rice farmers. Cash loans of rice farmers ranged from ₱1,500 to ₱2,000 while loans of corn farmers ranged from ₱2,500 to ₱4,000/cropping season. On the other hand, rice farmers availed credit in-kind ranging from ₱1,000 to ₱1,500 while that of corn farmers ranged from ₱1,800 to ₱2,500/cropping season. Although cash

**Table 24.** Marketing problems of farmers under BARIS, 1986/87 and 1987/88 dry seasons.

Problems	Rank					
	Irrigated Rice		Irrigated Corn		Rainfed Corn	
	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88
Low farmgate prices	1	1	1	1	1	1
Existence of marketing tie-up	2	2	2	2	2	2
Lack of transport facilities		3		3		3
Lack of grading and standardization	3		3			
Distance of marketing outlet					3	

**Table 25.** Credit profile of farmers under BARIS, **1986/87** and **1988/88** dry seasons.

	Irrigated Rice		Irrigated Corn		Rainfed Corn	
	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88
<i>Farmers who availed credit (%)</i>						
Cash	70	64	58	62	54	50
In kind	44	50	52	56	54	60
<i>Amount of credit per cropping season (₱)</i>						
Cash	1611	1991	2590	4341	3081	2681
In kind	1427	1146	2401	2510	2084	1858
<i>Utilization of cash loans (%)</i>						
Agri purposes	75	72	56	73	58	49
Non-agri purposes	25	28	44	27	42	51
<i>Average annual interest</i>						
Cash loans	1212	2660	977	2006	2453	1595
	(75%)	(132%)	(38%)	(46%)	(80%)	(60%)
Credit in kind	1108	542	679	997	1188	903
	(78%)	(48%)	(28%)	(40%)	(57%)	(49%)

loans were intended to purchase items for farm use, **25 to 44%** of it was used for household purposes. Non-formal credit institutions were the primary sources of cash loans. Such sources included local traders, neighbors/friends, and relatives who charged high interest rates. Local traders usually required the farmers a marketing tie-up which was more to the disadvantage of the farmer.

Choice for sources of credit in the order of preference were bank, local traders, relatives and neighbors/friends. Reasons for availing credit from these sources were low interest rates, and

immediate availability and convenience of availing credit (Table 26).

Rice farmers in BARIS availed of credit in-kind which included fertilizer, pesticides and herbicides while credit in-kind of corn farmers consisted of fertilizer and seeds. Fertilizer was the bulk of the farmers' credit in-kind.

The same loan-related problems as that in ARIP I were encountered by BARIS farmers. High interest rates and bank bureaucracy were the most common problems encountered.

**Table 26.** Factors considered by farmers under BARIS in their choice of credit source, **1986/87** and **1987/88** dry seasons.

Factors	Rank					
	Irrigated Rice		Irrigated Corn		Rainfed Corn	
	1986/87	1987/88	1986/87	1987/88	1986/87	1987/88
Low interest rates	1	1	1	1	1	1
Immediate availability of credit	2	3		3	2	2
Convenience of availing credit	3	2	2	2	3	3

## Mani Communal Irrigation System

**Demographic characteristics.** Generally, farmers under MCIS were older than farmers under ARIP I or BARIS; with ages ranging from 51 to 52 years. Most farmers were male and married with 24 to 26 years of farming experience. Most farmers under MCIS reached first year high school. Average family size was composed of seven to eight members. Farming was the family's main source of livelihood. Like in BARIS, MCIS farmers were categorized into three, rice farmers, irrigated (seepage) corn farmers, and rainfed corn farmers.

**Land holdings and utilization.** Average farm sizes in MCIS ranged from 1.33 to 1.81 hectares (Table 27). Farms were located at various laterals of the irrigation system and most were owned by the farmers themselves. Unlike farms in ARIP I and BARIS, corn farms in MCIS were located at either head, middle or tail of almost all the laterals.

Farmers planted rice due to the availability of water supply, domestic need for rice and the

marketability of palay in the local market. Corn farmers whose farms were irrigated, planted corn because of the availability of water, perceived high returns of corn and the marketability of the produce. Like in BARIS, corn farmers could have opted for rice if irrigation water was enough,

Rice farmers considered the following in determining their farm's area to be planted: availability of water supply, market demand of the produce and experiences based on the previous dry season. Corn farmers considered experiences based on the previous dry season and the risk involved in growing the crop.

**Profitability and labor requirement.** Rice farmers under MCIS produced the highest crop yield (4.2 t/ha) and obtained the highest returns above variable cost (₱6,779/ha, Tables 28 and 29). Growing irrigated hybrid corn under MCIS was not as profitable as rice. Irrigated hybrid and native varieties yielded more than rainfed corn in MCIS. Although irrigated corn was not as profitable as rice, the high yield obtained indicated that corn is a potential crop for diversified irrigation systems.

**Table 27.** Land holdings of farmers under MCIS, 1986/87 dry season.

Characteristics of Land Holdings	Irrigated Rice	Irrigated Corn	Rainfed Corn
<b>Farm area (ha)</b>	<b>1.43</b>	<b>1.33</b>	<b>1.81</b>
<b>Tenure (%)</b>			
Owned	100	91	66
Tenanted	0	9	34
Leased	0	0	0
Others	0	0	0
<b>Lateral location (%)</b>			
A	17	18	n.a.
B	17	9	n.a.
C	17	14	n.a.
D	17	41	n.a.
E	17	18	n.a.
F	18	0	n.a.
<b>Location within lateral (%)</b>			
Head	14	41	n.a.
Middle	66	45	n.a.
Tail	20	14	n.a.
<b>No. of parcels/farm (%)</b>			
One	91	100	
Two	9	0	
Three or more	0	0	
<b>Land utilization (%)</b>			
Wet season	100	100	
Dry Season	100	100	

**Table 28.** Mean yield, returns above variable cost, and average price of produce, MCIS, 1986/87 dry season.

	Irrigated Rice	Irrigated Corn		Rainfed Corn	
		Hybrid	Native	Hybrid	Native
No. of samples	35	14	21	10	25
Ave. price (₱/kg)	2.57	2.23	2.12	1.86	2.10
Yield (kg/ha)	4174	2749	2428	2171	1765
Family labor (md, mad, mmd)	47	50	44	24	37
Gross returns (₱/ha)	10734	6091	5187	4104	3671
Total variable cost (₱/ha)	3954	2809	2035	2289	1630
Material cost (₱/ha)	2051	1570	919	1149	584
Labor and power cost (₱/ha)	1904	1239	1055	1140	1046
Returns above variable cost (₱/ha)	6780	3282	3152	1815	2041

**Table 29.** Comparison between yield, cost of production, and returns above variable costs of irrigated (IR) and rainfed (RF) crops in MCIS, 1986/87 dry season.

	Difference			
	IR Rice versus IR Hybrid corn	IR Rice versus IR Native corn	IR Hybrid corn vs. RF Hybrid corn	IR Native corn vs. RF Native corn
Yield (kg/ha)	1425 **	1746 **	578 *	662 *
Total family labor (md, mad, mmd)	~ 3.0 ns	3.5 ns	25.7 **	5.9 ns
Gross returns (₱/ha)	4643 **	5547 **	1988 *	1516 ns
Total variable cost (₱/ha)	1146 *	1920 **	520 ns	404 ns
Labor and power cost (₱/ha)	664 **	848 **	99 ns	9 ns
Material cost (₱/ha)	481 *	1072 **	422 ns	396 **
Returns above variable cost (₱/ha)	3497 **	3628 **	1469 *	1112 *

\*\* significant at 1%

\* significant at 5%

ns = not significant

Rice and corn had the same labor requirement especially when rice was directseeded (Table 30). Farm operations involved in irrigated corn farms were the same with that of rainfed farms. Differences in man-days and man-animal days between the two farms was due to higher yields obtained from irrigated corn farms where more days were needed to harvest and shell the produce.

**Table 30.** Labor requirement per hectare. MCIS, 1986/87 dry season

Type of Labor	Irrigated Rice	Irrigated Corn	Rainfed Corn
1. man-days	<b>40.5 ds</b> <b>59.1 tp</b>	<b>49.5</b>	<b>42.6</b>
2. man-animal days	9.1	10.8	<b>1.2</b>
3. man-machine days	<b>2.8</b>	<b>3.0</b>	<b>2.5</b>

Legend: **ds** - direct-seeded (broadcasted)  
tp - transplanted

Production-related problems under MCIS included inadequacy of water supply, high cost of farm inputs and lack of capital (Table 31). Availability of labor was not a problem. The farmer and members of his family provided farm labor. Hired labor was used to augment existing family labor during peak seasons. Machinery was **also** used in the farm.

**Table 31.** Production problems of farmers under MCIS, 1986/87 dry season.

Problems	Rank		
	Irrigated Rice	Irrigated Corn	Rainfed Corn
Inadequacy of water supply	1		1
Lack of capital	<b>2</b>	3	3
High cost of chemicals	<b>3</b>	<b>1</b>	<b>2</b>
High cost of seeds		<b>2</b>	

**Marketing.** Farmers under MCIS dry their produce before selling them. Distance of the trading center from the farms was **7.5** to 10 km (Table 32). Local traders were the most popular

market outlets. Factors considered by farmers in choosing their buyers were: price offered, mode of payment for their produce and accessibility and honesty of the trader. Some local traders offered high prices for their produce comparable to that of the National Food Authority. Local traders **also** paid the farmers in cash.

**Table 32.** Marketing practices of farmers under MCIS, 1986/87 dry season.

Marketing Practices	Irrigated Rice	Irrigated Corn	Rainfed Corn
<b>Condition of product sold (%)</b>			
Dried palay/shelled corn	100	86	<b>83</b>
Wet-fresh/shelled corn	0	0	0
Milled rice/corn	0	<b>14</b>	<b>17</b>
<b>Marketing outlet (%)</b>			
Local traders	60	100	<b>100</b>
NFA	17	0	0
Farmers' cooperative	8	0	0
Other	<b>15</b>	<b>100</b>	<b>100</b>
<b>Mode of payment (%)</b>			
Cash	<b>100</b>	<b>100</b>	<b>100</b>
Check	0	0	0
Installment	0	0	0
<b>Distance of farm to market outlet (km)</b>			
	<b>1.7</b>	<b>9</b>	10
<b>Marketing cost/farm (P)</b>			
	<b>80</b>	<b>114</b>	<b>152</b>
<b>Mode of sale (%)</b>			
Delivered	<b>54</b>	<b>42</b>	<b>54</b>
Picked-up	<b>46</b>	<b>58</b>	<b>46</b>

Marketing problems encountered by farmers under MCIS were low price offered for their produce, lack of transport facilities, lack of product standards and marketing tie-up between traders and jeepney drivers.

**Credit.** Although lack of capital was one of the production problems in the area, only **14%** of the rice farmers availed of cash loans amounting to **₱3,900/cropping season** (Table 33). Most of the loans were secured from the rural and Philippine National Bank. Problems encountered by farmers in availing loans were high interest rates charged by the rural bank (67%/year) and the bank's bureaucracy.

None of the farmers claimed to have incurred loans in kind. Instead, truck and jeepney owners provided the farmers' inputs such as seeds, fertilizer and other chemicals with neither interest nor profit but with the condition that the vehicle's owner/driver deliver the produce to the buyer of his choice. In this case, traders provided incentives to vehicle owners/drivers like a certain percentage of the cost per kilogram of the produce and reimbursement of the delivery fare. Inputs provided by truck owners were not considered loans; instead, they deprived the farmer the privilege to choose the buyers of their produce.

**Table 33.** Credit profile of rice farmers under MCIS, 1986/87 dry season.

Credit Profile	Irrigated Rice	Irrigated Corn	Rainfed Corn
<b><i>Farmers who availed of credit (%)</i></b>			
Cash	14	0	0
In kind	0	0	0
<b><i>Amount of credit/cropping season for those who availed of credit (₱)</i></b>	<b>3,900</b>		
<b><i>Utilization of cash loan (%)</i></b>			
Agricultural purpose	100		
Non-agricultural purpose	0		
<b><i>Average interest per cropping (₱)</i></b>	<b>522</b>		
<b><i>Sources of credit (%)</i></b>			
PNB	20		
Rural Bank	67		
Neighbors/friends	13		
<b><i>Annual interest rates (%)</i></b>			
PNB	28		
Rural Bank	67		
Neighbors/friends	5		

## Yield and Profitability of Farms Under ARIP I, BARIS and MCIS

During the 1986/87 dry season, farms in ARIP I produced the highest yield of irrigated rice, farms in MCIS and BARIS ranked next in that order (Tables 34 and 35). Gross returns were higher in farms in MCIS and ARIP I than farms in BARIS. However, farms under the three irrigation systems did not differ in the returns above variable

cost because of the higher production cost incurred in farms under ARIP I and MCIS. Irrigated hybrid corn performed better under BARIS than under MCIS.

During the 1987/88 dry season, there were no differences observed on the performance of both irrigated rice and irrigated hybrid corn planted in ARIP I and BARIS. Production performance of farms in MCIS was not compared because it was not included during the 1987/88 dry season survey.

**Table 34.** Comparison of yields, costs and returns between irrigated rice and irrigated hybrid corn under ARIP, BARIS, AND MCIS, 1986/87 dry season.

	Irrigated Rice			Irrigated Hybrid Corn
	MCIS versus ARIP	BARIS versus ARIP	BARIS versus MCIS	BARIS versus MCIS
Yield (kg/ha)	- 226 ns	- 587 **	- 371 ns	1554 **
Total family labor (md, mad, mmd)	8.1 ns	5.0 ns	- 3.1 ns	- 28.7 **
Gross returns (₱/ha)	- 171 ns	- 1950 **	1779 **	4594 **
Labor and power cost (₱/ha)	- 666 **	- 1567 **	- 901 **	- 152 ns
Material cost (₱/ha)	- 264 *	- 19 ns	245 ns	204 ns
Total variable cost (₱/ha)	- 930 **	- 1585 **	- 656 *	53 ns
Returns above variable cost (₱/ha)	759 ns	- 364 ns	- 1123 ns	4541 **

\*\* significant at 1%

\* significant at 5%

ns = not significant

**Table 35.** Comparison of yield, costs and returns between irrigated rice and irrigated hybrid corn under ARIP and BARIS, 1987/88 dry season.

	Irrigated Rice	Irrigated Hybrid Corn
	ARIP vs BARIS	ARIP vs BARIS
Yield (kg/ha)	142 ns	- 295 ns
Total family labor (md, mad, mmd)	- 8.1 ns	5.6 ns
Gross returns (₱/ha)	855 ns	- 1997 ns
Labor and power cost (₱/ha)	66 ns	- 193 ns
Material cost (₱/ha)	- 91 ns	217 ns
Total variable cost (₱/ha)	- 25 ns	24 ns
Returns above variable cost (₱/ha)	880 *	- 2021 *

\*\* significant at 1%

\* significant at 5%

ns = not significant



## Conclusions and Recommendations

Irrigated hybrid corn showed good potential as an alternative crop to irrigated rice for farms in BARIS and MCIS. Growing corn can be equally as profitable as irrigated rice considering labor requirements. Although irrigated hybrid corn was not **as** profitable as irrigated rice in MCIS, irrigated corn farms produced better yield and obtained more profit than rainfed farms. Therefore irrigation had a significant impact in hybrid and native corn production in MCIS.

Irrigation of corn in ARIP I during the 1987/88 dry season did not show significant effects.

Irrigated hybrid corn production was not **as** profitable **as** rice. Production did not, however, differ between irrigated and rainfed corn farms.

Irrigated corn production can be **as** profitable as rice provided there are adequate price incentives. One of the reasons why irrigated corn planted during the 1987/88 dry season was not **as** profitable as that during the 1986/87 dry season was due to the decrease in farmgate prices. Price for palay in 1987/88 increased but prices for corn decreased.

Other non-rice crops may be adopted by farmers if they are familiar with production aspects of the crop and its market is assured at a commensurate price.