Status and Prospects of Fruit Production in Ilocos Sur

MATEO L. CABANTING, JR.
CONCEPCION B. AZARES
SOLITA EVANGELINE S. BANEZ

Abstract

This study was conceived to determine the status and prospects of fruit production in the province of Ilocos Sur.

Specifically, this study aimed to identify the varieties of fruit-bearing plants grown in the different municipalities of Ilocos Sur; assess the market potential of these fruits; determine the common problems encountered by the growers and their suggestions to surmount these problems; and identify the kind of support provided by the government and the private sector.

The descriptive survey method was used. A questionnaire checklist was utilized to gather data from the respondents randomly selected from nine interior municipalities and seven lowland municipalities in Ilocos Sur.

The study revealed that there were more male than female respondents. Most of them were married, belonged to the age bracket of 31-40 and 51-60, had five to six household members, and had a monthly income of P1,000 & below. Aside from fruit venture, other sources of income were: farming, animal raising and working as barangay officials. The average monthly income of household members was P5,000 and below.

The fruit-bearing plants grown in Ilocos Sur were: banana, calamansi, native mango, pineapple, avocado, rambutan, papaya, coconut, siniguelas, jackfruit, guava, Indian mango, chico, guayubano, atis, camachili, santol, orange, kasoy, starapple, tamarind, pomelo, and blackberry.

The fruit growers were engaged in this venture mainly to earn additional income. They sold the fruits either on wholesale or retail in the following: local market, neighborhood, nearby towns/provinces, other regions, and for export.

The respondents assessed the price of their products to be "fair" (45.79%), "break even" (43.16%) or "low" (36.84%).

The JO most profitable fruit business ventures in terms of income derived were ranked as follows: mango, grapes, rambutan, kasoy, banana, calamansi, pineapple, coconut, and avocado.

Most of the respondents claimed that their fruit business venture was self-financed; however, they received minimal financial support from cooperatives, from the government which provided technology and seedlings, and from the private sector which provided fertilizer and insecticides. Seminars were given to them by the Department of Agriculture as technical assistance.

The most common problems encountered by the fruit growers were lack of water supply, low price during peak of harvest, lack of technical know-how on fruit tree propagation, and lack of capital.

To solve their problems most respondents suggested the following: in planting – there should be a project on water system, seminar on propagating fruit-bearing plants and pest disease control, and more seedlings for sale at low price; in marketing - improved transportation facilities, full support from the government, and improved farm to market roads during the peak of harvest; on technical problems - seminar on food preservation, assistance from agricultural technologists, training on crop protection, more trainings sponsored by experts, and discovery of effective pest and disease control; and on financial problems - loans with low or no interest, financial assistance from the government, seed capital for cooperatives, and extension of loan/ bank services to the barangays.

Introduction

Trees do not only provide shelter and housing but also food which offers vital assurance during times of seasonal food shortages. Likewise, these fruit trees provide much needed herbal medicine in the rural areas. Nearly everyone consumes fruits in one form or another. Among the fruits that have gained popularity in the world market are avocados, mangoes, and guavas. Many households throughout the world grow trees in their homes and gardens to supplement their diets with fruits, nuts, edible leaves, and other foodstuffs.

Fruits make a particularly important contribution to the nutrition of the rural poor. Forest-dwelling hunters and gatherers, the world's 300 million shifting cultivators, and millions of smallholder and landless households living near forests depend on fruits as part of their survival strategies.

Although the Philippines is conducive to growing only a few economically significant fruit species, its warm tropical climate and fertile soil have immensely stimulated the successful

introduction and domestication of many other species. Thus, at present no less than 200 kinds of fruit exist in the country. Of this number, only about 40 or 50 species are grown to some extent for food and other uses. The rest are still found in the wild areas, or if already domesticated, are not yet cultivated or being given significant attention (Coronel, 1994).

Proper management conservation and preservation of our country's natural wealth depend to a large extent on the availability of up-to-date, comprehensive, and reliable information on the nature, magnitude, and potentials of these natural resources. Presence of and access to such baseline data enable resource managers and decision-makers to plan and implement rational judgments as to the disposition and/or allocation of existing natural resources for optimum socio-economic utilization, conservation or sustained renewability, and protection when the resource is in danger of depletion or extinction.

The direction of research activities on fruits was being accomplished by a multidisciplinary approach in the field of varietal improvement, soils and nutrition; propagation; production and management; crop protection; post-harvest handling and processing; and utilization. The major thrust was placed on mango because of its potential as a major export commodity. Therefore, studies from varietal improvement up to processing and utilization were fully explored.

As to fruit production, Ilocos Region is the primary producer of mango in the country in terms of area. However, the region still depends primarily on Southern Tagalog, particularly Batangas, for planting materials. It has been observed that some seedlings which the seller claimed as "carabao" turned out to be other varieties. Local producers of mango must be able to obtain and maintain good quality fruits both for export and domestic consumers (Pascua, 1999).

The increasing sophistication of technology, supported by the government policy to liberalize the market, gave a favorable market potential for fruit growing ventures. Many of our growers and dealers are convinced that demand continued to increase with a good price in the export market. This bright prospect has encouraged entrepreneurs to invest in this kind of activity. To realize fully the potential of our province, this research project attempted to gather important information which will be of great help to the people and the researchers in the industry as well as the potential fruit tree growers.

It was also hoped that this study would encourage many people to grow fruits for home use or the market, for better nutrition as well as income generation. Teachers, researchers, extentionists, students, fruit growers, and the general public all stand to gain from this significant contribution to literature on Philippine agriculture, hence, a catalyst in the maximum realization of our vision for development.

Objectives of the Study

This study was conceived to detennine the status and prospects of fruit production in the province of Ilocos Sur.

Specifically, this study aimed:

1. To identify the varieties of fruit-bearing plants grown in the different municipalities of Ilocos Sur.
2. To determine the main reason/s for engaging in fruit-bearing business ventures.
3. To assess the market potential of fruit-bearing plants as perceived by the growers.
4. To determine the most profitable fruit business venture.
5. To identify the kind of support provided by the government and the private sector.
6. To identify the problems commonly encountered by the growers and their suggested solutions.

Review of Related Literature

This section provides a review of the studies which give some direct bearing to this study.

Pascua (1999) conducted a study on Promising "Carabao" Mango Cultivars. She concluded that Isozyme analysis showed that the genetic variation in "carabao" mango is very small. "Carabao" mango from any growing area in the Philippines has the same genetic characteristics. However, differences in morphological characteristics exist among and within populations. These differences arise as an effect of the environment or due to genetic-environment interaction.

Bilag et. al. (1985) concluded in their study, "Assessment of the Perfonnance of Coffee Trees under Partially-Shaded and Exposed Conditions" that partial shading significantly affects the height, stem, size, fruiting branches, and fruiting node density of a coffee plant. Moderate shading slightly favors the increase in height, stem size, and development of fruiting branches. Productivity of the coffee plant is achieved provided that proper care and management are employed.

Patena, et. al. (1985) state in their study entitled, "Tissue Culture of Banana" that initial trials using five banana cultivars (Morado, Moradong Puti, Bungulan, Ambon, and Butuhan) showed differential response to in vitro culture. Further trials using 17 other cultivars showed the same differential response. Some cultivars showed shoot proliferation. Others just formed vigorous shoot at the expense of multiple shoot formation. When the regenerated shoot was sub-cultured, preliminary results showed that more shoots were

formed. The cultivar, browning of tissue and media, and the size of initial explant used contributed to the observed differential responses.

Methodology

This study was conducted from January to December 3000. The descriptive survey method was used. The respondents were selected randomly from nine interior municipalities and seven lowland municipalities, three from the first district and four from the second district. A questionnaire checklist was utilized to gather the data. This was personally delivered to the respondents and retrieved. The data were classified, tallied, and presented in sequential arrangement of the stated specified problems of the study. Frequencies, percentages, and ranks were used in the analysis of data.

Discussion of Results

Profile of Respondents

This portion presents the socio-economic profile of the respondents who were engaged in planting fruit-bearing plants.

The socio-economic profile of respondents was deemed necessary in this study to give a basic information about the fruit-bearing plant growers in Ilocos Sur. These are shown in Table 1.

Table 1. The socio-economic characteristics of fruit-bearing plant growers.

SOCIO-ECONOMIC CHARACTERISTIC	NO.	%
Sex		
Male	232	83.15
Female	47	16.85
Civil Status		
Single	5	1.79
Married	243	87.10
Widow/er	28	10.03
Separated	3	1.08
Age		
Below 20	15	5.38
21-30	43	15.41
3140	78	27.96
41-50	82	29.39
51-60	61	21.86

Table 1. Continued.

SOCIO-ECONOMIC CHARACTERISTIC	NO.	%
Number of household members		
1–2	19	6.81
3–4	86	30.82
5-6	120	43.01
7–8	23	8.24
9 & above	31	11.11
Monthly income from fruit venture		
No income yet (new)	3	1.06
P 1000&below	134	48.03
1001– 3000	15	26.88
3001 –5000	37	13.26
5001 –7000	15	5.38
Above7000	15	5.38
Sufficiency of income from fruits		
Sufficient	59	21.15
Not sufficient	181	64.87
No answer	39	13.98
Other sources of income		
Barangay official	75	26.88
Provincial official	2	0.72
Private firm employee	5	1.79
Municipal official	3	1.08
Government employee	24	8.60
Farming	187	67.02
Fish culture	34	12.19
Animal raising	101	36.20
Business	29	10.39
Driving	4	1.43
Abroad	4	1.43
Carpentry	2	0.42
Pension	3	1.08
Welder	8	2.87
Average monthly income of household members		
P 5000 & below	123	44.09
5001–9000	93	33.33
9001– 13000	37	13.26
13001 – 17000	15	5.38
Above 17000	11	3.94

Out of the 279 respondents, 83.15% were male and 16.85% were female; 87.10% were married and all the rest were either single, widow/er or separated; 29.39% were 41-50 years old; 27.96%, 31-40 years old; and 21.86%, 51-60 years old. As regards the number of household members, the most was 5-6 members (43.01%), followed by 3-4 members (30.82%), and 9 or more members (11.11%). On the respondents' monthly income derived from fruit venture, 48.03% earned P1,000 and below only; 26.88% earned P1,001-3000; 13.26% eared P3,001-5,000; and the rest eared P5,001 and above. The respondents' monthly income was not sufficient as claimed by 64.87% of them. They had other sources

of income, such as farming (67.02%), animal raising (36.20%); and serving as barangay officials (26.88%). As to the average monthly income of all household members, 44.09% claimed an income of P5,000 and below; 33.33% had an income of P5,001-9,000; and the rest had P9,001 to more than P17,000.00.

Varieties of Fruit-bearing Plants Grown in the Different Municipalities

Based on the data gathered, 23 kinds of fruit-bearing plants were grown in 16 municipalities of Ilocos Sur surveyed. Table 2 shows that all the 16 municipalities planted bananas and native mango. Less than 35,000 banana plants were grown but only 6,442 native mango trees were produced. Nine municipalities each grew a total of 4,897 pineapple plants and 1,595 coconut trees; eight grew 1,845 papaya trees; seven planted 2,183 avocado trees; and six municipalities each planted calamansi (7,340 plants), Indian mango (766 trees), guayubano (589 trees), and tamarind (316 trees).

Table 2. Fruit-bearing plants grown in Ilocos Sur, CY 2000.

FRUIT-BEARING PLANT	NO. OF MUN. GROWING THE PLANTS	TOTAL NO. OF PLANTS	AVE. LENGTH OF EXISTENCE (Year)
Banana	16	4 34,934	1253
Native mango	16	6,442	29.13
Pineapple	9	4,897	**8.00**
Coconut	9	1,595	24.44
Papaya	8	1,845	12.13
Avocado	7	2,183	17.43
Calamansi	6	7,340	10.33
Indian mango	6	766	21.83
Guayubano	6	589	12.50
Tamarind	6	316	36.50
Rambutan	5	1,892	**8.00**
Siniguelas	5	1,325	25.40
Jackfruit	5	825	25.00
Guava	5	777	12.20
Chico	5	653	25.00
Atis	5	501	11.40
Santol	5	418	15.20
Orange	5	416	8.00
Kasoy	5	403	6.40
Starapple	5	378	17.20
Pomelo	5	280	11.20
Blackberry	5	85	24.00
Camachili	4	434	31.25

Moreover, the following fruit bearing plants were grown by five municipalities rambutan, siniguelas, jackfruit, guava, chico, atis, santol, orange, kasoy, starapple, pomel and blackberry. Only four municipalities grew 434 camachili.

Among these plants, the oldest grown were tamarind (36.5 years old), camachi (31.25 years old), native mango (29.13 years old), siniguelas (25.40 years old), jackfruit an chico (25 years old), coconut (24.44 years old), and blackberry (24 years old). On the hand, the youngest fruit-bearing plants were kasoy (6.40 years old) and orange, pineapple and rambutan (8 years old).

Top five varieties. Table 3 presents the top five varieties of fruit-bearing plant grown in each of the municipalities of Ilocos Sur where the respondents came from. table also presents the number of plants grown and the number of years of existence.

Table 3. The top five fruit-bearing plants grown per municipality in Ilocos Sur, **2000.**

MUNICIPALITY/FRUIT TREE	NO. OF PLANTS **GROWN**	LONGEST YEAR **OF EXISTENCE**
A. Interior		
Alilem		
Banana	1209	4
Pineapple	385	5
Avocado	460	20
Native mango	227	30
Papaya	308	10
Banayoyo		
Native mango	858	40
Banana	410	20
Pineapple	261	8
Guava	140	40
Papava	93	15
Burgos		
Native mango	802	40
Banana	120	5
Papaya	210	10
Coconut	81	3
Calamansi	75	5
Del Pilar		
Banana	2185	15
Pineapple	1260	15
Native mango	770	30
Papaya	488	10
Avocado	304	20

Table 3. Continued.

MUNICIPALITY/FRUIT TREE	NO. OF PLANTS GROWN	LONGEST YEAR OF EXISTENCE
Galimuyod		
Banana	22070	13
Native mango	302	20
Calamansi	160	10
Avocado	158°	20
Pineapple	130	3
Salcedo		
Banana	5820	20
Rambutan	1182	15
Calamansi	653	10
Pineapple	320	2
Native mango	231	20
San Emilio		
Pineapple	1052	11
Banana	796	5
Native mango	461	20
Coconut	354	6
Papaya	226	14
Sigay		
Banana	1110	8
Pineapple	400	11
Orange	79	2
Native mango	47	5
Coconut	35	10
Sugpon		
Pineapple	999	8
Avocado	518	20
Native mango	461	30
Rambutan	286	6
Coconut	139	20
B. Lowland – First District		
San Ildefonso		
Siniguelas	1006	50
Native mango	451	50
Calamansi	415	20
Indian mango	151	40
Banana	50	5

Table 3. Continued.

MUNICIPALITY/FRUIT TREE	NO. OF PLANTS GROWN	LONGEST YEAR OF EXISTENCE
Sinait		
Native mango	584	70
Banana	524	50
Indian mango	161	25
Chico	157	25
Papaya	149	4
Sto. Domingo		
Calamansi	507	19
Banana	216	10
Native mango	141	21
Santol	104	21
Indian mango	47	15
C. Lowland – Second District		
Candon		
Coconut	370	30
Native mango	340	20
Banana	125	6
Papaya	96	6
Guayubano	83	10
Sta. Lucia		
Coconut	155	45
Native mango	140	20
Guava	120	15
Siniguelas	99	25
Banana	49	10
Sta. Maria		
Native mango	320	35
Banana	166	15
Coconut	134	21
Pineapple	90	9
Avocado	58	7
Tagudin		
Calamansi	5530	7
Native mango	307	15
Papaya	275	3
Coconut	152	20
Banana	84	2

Interior municipalities. In Alilem, banana was the most planted, but native mango was the oldest grown; it existed for 30 years. The other top fruit trees found in Alilem were avocado, pineapple, and papaya. Native mango was the top grown fruit tree in Banayoyo and it had existed for 40 years. This was followed by banana, pineapple, guava, and payaya. In Burgos, native mango was also the number one and it had existed for 40 years. The other fruit trees grown in Burgos were papaya, banana, coconut, and calamansi. Bananas were abundant in Del Pilar, followed by pineapple, native mango, papaya, and avocado, but the oldest was native mango (30 years old). Galimuyod was also famous for banana, native mango, calamansi, avocado, and pineapple with native mango and avocado as the oldest (20 years old). Like Alilem, Del Pilar, and Galimuyod, Salcedo was known as a banana-growing municipality for the last 20 years. This was followed by rambutan, calamansi, pineapple, and native mango. On the other hand, pineapple was the major fruit-bearing plant grown in San Emilio, followed by banana, native mango (the oldest), coconut, and papaya. Bananas were also planted mostly in Sigay, followed by pineapple, orange, native mango, and coconut. The oldest fruit-bearing plant in Sigay was pineapple; it had existed for 11 years. In Sugpon, pineapple was the prime fruit-bearing plant, but native mango was the oldest. Avocado, coconut, and rambutan were also planted in Sugpon.

Lowland-First District. The top fruit-bearing plant grown in San Ildefonso was siniguelas. Together with native mango it had existed the last 50 years. Other fruit-bearing plants grown in this municipality were calamansi, Indian mango, and banana. In Sinait, native mango was number one and was the oldest fruit-bearing plant in all municipalities of Ilocos Sur, for it had existed for 70 years. Indian mango, chico, and papaya were also grown in Sinait. On the other hand, the top fruit-bearing plant grown in Sto. Domingo was calamansi, followed by banana, native mango, santol, and Indian mango. Native mango and santol were the oldest; they were planted the last 21 years.

Lowland – Second District. Coconut was the top and oldest fruit-bearing plant grown in Candon. This was followed by native mango, banana, papaya, and guayubano. Likewise, Sta. Lucia's prime and oldest fruit-bearing plant was coconut. This had been planted 15 years earlier in Sta. Lucia than in Candon. The other top fruit-bearing plants grown in Sta. Lucia were native mango, guava, siniguelas, and banana. On the other hand, native mango was number one in Sta. Maria and had existed for 35 years, followed by banana, coconut, pineapple, and avocado. In Tagudin, calamansi was number one, but coconut was the oldest fruit-bearing plant, followed by native mango, papaya, and banana.

In general, the top fruit-bearing plants grown in the different municipalities were the following: banana (Alilem, Del Pilar, Galimuyod, Salcedo, and Sigay): native mango (Banayoyo, Burgos, Sinait, and Sta. Maria); calamansi (Sto. Domingo and Tagudin); coconut (Candon and Sta. Lucia); pineapple (San Emilio and Sugpon); and siniguelas (San Ildefonso).

Reasons for Engaging in this Venture

The fruit-bearing plant growers gave several reasons for engaging in this venture and these are presented in Table 4.

Table 4. Reasons of respondents for engaging in fruit-bearing plants venture.

REASON	FREQUENCY OF MENTION N = 279	%	RANK
As a means of earning additional income	212	75.99	1
Own satisfaction	126	45.16	2
Means of livelihood	78	27.96	3
For recreation	70	25.09	4
Recipient of government support	22	7.89	5
Caretaker	13	4.66	6
For personal consumption	11	3.94	7
To help maintain clean & green program	6.	2.15	8
Recipient of NGO support	2	0.72	10
Next generation's welfare	2	0.72	10
Soil erosion control	2	0.72	10

The primary reason was "as a means of earning additional income" as claimed by 75.99% of the respondents, followed by "own satisfaction" as claimed by 45.16%. Ranked third was "means of livelihood" (27.96%), followed by "for recreation" (25.09%). Some respondents said they engaged in fruit-bearing plants venture because they were "recipients of government support" (7.89%), "as caretaker" (4.66%); "for personal consumption" (3.94%), and to "help maintain clean and green program" (2.15%). Three reasons were ranked 1O as claimed by two respondents each, namely: "recipient of NGO support" "next generation's welfare", and "soil erosion control."

Market Potentials

The respondents' perceptions on the market potentials of fruits are presented in Table 5.

Table 5. Perceptions of respondents on the market potentials of their products.

MARKET POTENTIAL	NO.	%
Place where products are sold		
Local market	158	56.63
Neighborhood	154	55.20
Nearby towns	121	43.37
Nearby provinces	66	23.66
For exports	22	7.89
Other regions	7	2.51
Buyers of products		
Consumers	177	63.44
Retailers	131	46.95
Wholesalers	117	41.94
Exporters	26	9.32
Middlemen	12	4.30
Food orocessors	7	2.51
Status of demand and supply		
Demand is more than the supply	168	60.22
Demand is equal to supply	56	20.07
Demand is less than supply	30	10.75
No response	25	8.96
Assessment of the price of products		
Low (cost is more than income)	70	25.09
Break even (income is equal to cost)	82	29.39
Fair (little income, 10- 20% more than the cost)	87	31.18
High (satisfactory income, 21–40%)	19	6.81
Very high (income is more than 50% of cost)	7	2.51
No response	14	5.02

On the place where their products are sold, majority said that their products were sold in local market (56.63%), in the neighborhood (55.20%), and in nearby towns (43.37%). The rest were sold in nearby provinces, were exported to other countries, and sold in other regions.

Regarding the buyers of their products, the respondents mentioned consumers (63.44%), retailers (46.95%), and wholesalers (41.94%). A few (9.32%) said that exporters bought their products and the rest mentioned middlemen and food processors as their buyers.

One important aspect of market potential is the status of demand and supply. It was found out in this study that 60.22% of the respondents claimed that demand was more than the supply. This implies that fruits were not enough to meet the peoples' need for fruits. One-fifth of them (20.07%) said that the demand was equal to supply, while 10.75% claimed

that demand was less then supply.

The price of their products was also assessed and the following were the results: 31.18% of the respondents claimed that it was fair, which means little income or income was 10-20% more than the cost; 29.39% of them assessed the price as break even, which means that income is equal to cost; 25.09% of the respondents assessed the price as low, which means that cost is more than the income; 6.81% of them gave a high assessment which means satisfactory income or income was 21%-40% more than the cost; and 2.51% claimed very high income, which means that their income was more than 50% of the cost.

The manner of selling the products was also assessed and the data are presented in Table 6.

Table 6. Respondents' manner of selling the products.

KINDOFFRUIT	WHOLESALE		RETAIL		BOTH	
	NO.	%	NO.	%	NO.	%
Mango	24	26.67	41	21.58	125	65.79
Jackfruit	9	4.74	23	12.11	27	14.21
Avocado	4	2.11	22	11.58	59	31.05
Starapple			18	0.47	5	2.63
Guayubano			25	13.16	17	8.95
Santol	8	4.21	17	8.95	23	12.11
Tamarind	8	4.21	13	6.84	11	5.79
Guava	2	1.05	16	8.42	19	10.00
Chico	4	2.11	21	11.05	14	7.37
Kasoy			5	2.63	1	0.53
Rambutan	2	1.05	6	3.16	7	3.68
Papaya	2	1.05	49	25.79	39	20.53
Banana	16	8.42	40	21.05	65	34.21
Coconut	1	0.53	36	18.95	33	17.37
Grapes			1	0.53	1	053
Calamansi	5	2.63	19	10.00	26	13.68
Pineapple	2	1.05	22	11.58	43	22.63
Pomelo	2	1.05	11	5.79	17	8.95
Orange			4	2.11	1	0.53
Siniguelas	3	1.58	14	7.37	4	2.11
Camachili	1	053	5	2.63	3	1.58
Blackberry	1	053	13	6.84	1	0.53
Atis			5	2.63	1	0.53
Makopa			5	2.63		
Coffee	7	3.68			8	4.21

Mango was sold either by wholesale or retail as claimed by 26.67% and 21.58%, respectively and by both wholesale and retail (65.79%). All the other fruits were sold in the same manner except starapple, guayubano, kasoy, grapes, orange, atis, and makopa which were not sold by wholesale, maybe because of the quantity of fruits.

Profitable Fruit Business Venture

The respondents' annual income derived from engaging in fruit business venture is presented in Table 7. The top IO most profitable business ventures are shown in Table 8.

Table 7. Annual income **derived from engaging in fruit-bearing plants venture per year.**

KIND OF FRUITS	INCOME (pesos)						TOTAL		AVE. ANNUAL INC. (Pesos)
	1-1000	1001-2000	2001-3000	3001-4000	4001-5000	5001 - 6000	No.	%	
Mango	19	28	6	6	II	86	156	55.91	3910.63
Banana	54	27	18	9	5	16	129	46.24	1973.37
Avocado	37	22	2	6	2	3	72	25.81	1431.06
Papaya	51	10		1	3	5	70	29.09	1214.79
Jackfruit	46	13				1	60	21.51	960.60
Coconut	35	11	1	2	2	6	57	20.43	**1500.50**
Pineapple	35	6	6	1	3	5	56	*20.07*	1536.21
Calamansi	23		4	1	6	7	45	16.13	1644.89
Santol	2	4					36	**12.90**	889.39
Tamarind	23	14			6	2	35	12.54	1586.21
Guayubano	32	4			1		34	13.98	647.56
Guava	29	1			1		32	11.47	**688.00**
Chico	19	2	1			2	28	10.04	1143.36
Pomelo	23	6					24	**8.60**	542.17
Starapple	17	1	4				22	7.89	*909.59*
Siniguelas	12	1					12	4.30	500.50
Rambutan	4				4	1	10	3.58	2700.50
Coffee	7	1					7	2.51	**71.50**
Blackberry	5				1		6	2.15	1167.17
Camachili	4			1			5	1.79	1100.50
Makopa	5						5	1.79	100.10
Kasoy	2				2		4	1.43	2500.50
Orange	3						3	1.08	**166.83**
Grapes						1	2	.007	3500.50
Atis	1	1			1		1	.003	500.50

It can be clearly gleaned on the tables that the highest income was derived from mango as claimed by 55.91% of the respondents whose average income from this fruit was P3,910.63. Second in rank was income derived from grapes (P3,500.50), followed rambutan (2,700.50), kasoy (2,500.50), and banana (1,973.37). The income from calamansi (Pl,644.89) was ranked sixth, while that from tamarind (Pl,586.21) was seventh. Ranked eighth to tenth were the income from pineapple (P1,536.21), coconut (P1,500.50), and avocado (P1,431.06), respectively.

Tble 8. Top 10 most profitable fruit business ventures.

KIND OF FRUITS	AVERAGE ANNUAL INCOME (Pesos)	RANK
Mango	3,910.63	1
Grapes	3,500.50	2
Rambutan	2,700.50	3
Kasoy	2,500.50	4
Banana	1,973.37	5
Calamansi	1,644.89	6
Tamarind	1,586.21	7
Pineapple	1,536.21	8
Coconut	1,500.50	9
Avocado	1,431.06	10

The distribution of respondents in terms of the kind of expenditure they incurred fruit business venture is presented in Table 9.

Table 9. Distribution of respondents according to the expenses incurred in fruit business venture.

ITEM OF EXPENDITURE	NO.	%
Production		
Seeds	132	47. 31
Labor	159	56.99
Fertilizer	268	74.55
Insecticide	173	62.01
Interest on loans	29	10.39
Gasoline for watering	14	5.02
Fruit inducer	5	1.79
Equipment	9	3.23
Marketing		
Transportation	140	50.18
Commission/interest	14	5.02
Labor	136	48.75
Market fees	4	1.43

The kind of expenditure is categorized into two, namely: production and marketing. In the production aspect, 74.55% of the respondents spent for fertilizer, 62.01% spent for insecticide, 56.99% for labor, 47.31% for seeds, and the rest for interest on loans, gasoline for watering, fruit inducer, and equipment.

In the marketing aspect, 50.18% of the respondents spent for transportation, 48.75% spent for labor, and a few spent for commission/interest and market fees.

Support Provided by the Government and NGOs

The fruit business venture needs support from persons or agencies who are capable to finance or extend help in this kind of venture. At this juncture, the researchers wanted to know from the fruit-bearing plant growers if they received any assistance. The data gathered are presented in Tables 10 and 11.

Table 10 clearly shows the kind of support provided by the government and private sector. The government provided the following support: technology to 53.76% of the respondents; seedlings to 37.63%, fertilizer to 5.73%, lot for planting to 3.58%; and insecticides to 2.87%. From the private sector fertilizer was provided to 22.22% of the respondents, insecticides to 20.43%; seedlings to 10.75%; technology to 7.17%; and lot for planting to 6.45% of the respondents.

Table 10. Kind of support provided by the government and private sector to fruit bearing plant growers.

KIND OF SUPPORT	GOVERNMENT		PRIVATE SECTOR	
	NO.	%	NO.	%
Seedlings	105	37.63	30	10.75
Fertilizer	16	5.73	62	22.22
Insecticides	8	2.87	57	20.43
Lot for planting	IO	3.58	18	6.45
Technology	150	53.76	20	7.17

Table 11 also presents the financial and technical assistance which the fruit-bearing plant growers received from different sources. The financial assistance came from the following: cooperatives, Land Bank, private sector, local officials, provincial officials, traders, and relatives, but 31.54% of the respondents said that their fruit venture was self-financed.

Technical assistance which was given during the conduct of seminars came mostly from the Department of Agriculture as claimed by 63.08% of the respondents and from the Municipal Government (40.86%). The other sources of technical assistance were the National

Government, universities/colleges, Department of Trade and Industry (DTI), Department Agrarian Reform (DAR), National Economic and Development Authority (NEDA), Technical Skills Development Authority (TESDA), cooperatives, and non-government organizations.

Table 11. Source of financial and technical assistance to the fruit-bearing plant growers.

KIND AND SOURCE OF ASSISTANCE	NO.	%
Financial		
LandBank	3	1.08
Private sector	10	3.58
Local officials	15	5.38
Provincial officials	5	1.70
Cooperatives	47	16.85
Traders	7	2.51
Relatives	4	1.43
Self-financed	88	31.54
Technical (conduct of seminars)		
Municipal government	114	40.86
Provincial government	13	4.66
National government	37	13.26
Universities/colleges	4	1.43
Department of Agriculture (DA)	176	63.08
Department of Trade & Industry (DTI)	32	11.47
Department of Agrarian Reform (DAR)	27	9.68
National Economic & Development Authority (NEDA)	7	2.51
Technical Skills Development Authority (TESDA)	32	11.47
Cooperatives	42	15.05
Non-government organizations	15	5.38

Problems Encountered By Growers

The problems met by growers were categorized into planting, marketing, technical, and financial. These data are presented in Table 12.

On planting. The most common problem met by 22.22% of the respondents was lack of water supply especially in the interior municipalities where the different fruit-bearing trees were abundantly found; in the lowlands, these fruit-bearing trees were usually planted in hilly parts of the land, so that the land could be fully utilized. Other planting problems met by more or less 2-10% of the respondents were the following: lack of government support, expensive seedlings, lack of materials, fruits were stolen, no seminar on propagation, pest and disease infestation, retarded growth, no lot for planting, stonn, high cost of labor, high price of gasoline and fertilizer, seeds were not available, difficulty in maintaining trees, some

insecticides could not control pests and diseases, too many expenses, calamities, and presence of astray animals that destroyed the young plants.

On marketing. The most common problem met by the respondents were the low price of fruits during peak of harvest (25.09%) and lack of buying stations for all kinds of fruits (19.0%). Other problems in marketing were the following: no price control, no buyers during peak of harvest, no transportation facilities, lack of farm to market roads, high cost of transportation, impassable roads during peak of harvest, fluctuation of prices, no permanent buyer, businessmen controlled the price of products, and lower buying prices of wholesalers.

On technical. The prime technical problems of growers were lack of knowledge on fruit tree propagation and lack of technical know how. Other problems were: no drip irrigation, obsolete technical assistance, lack of technical assistance from DA and TESDA, soil testing, price control, few technicians to assist growers and no result of soil analysis.

On financial. The foremost problems in terms of financial were lack of capital and high interest on loans. Other problems were: high cost of materials and fertilizer, no capital, capital came from loans, very high capital, no creditor, high tax, difficulty in acquiring loan from banks, lack of government support, and local government to lend money with low interest.

Table 12. Problems met by **growers in the different aspects of growing fruit-bearing plants.**

PROBLEM	NO.	%
Planting		
Lack of government support	5	1.79
Lack of water supply	62	22.22
Expensive seedlings	24	**8.60**
Lack of materials	4	1.43
Fruits were stolen	8	2.87
No seminar on propagation	5	1.79
Pest & disease infestation	21	7.53
Retarded growth	3	1.08
No lot for planting	4	1.43
Storm	**8**	2.87
High cost of labor	10	3.58
High price of gasoline & fertilizer	6	2.15
Seeds were not available	**14**	5.02
Difficulty in maintaining trees	19	**6.81**
Some insecticides could not control pests & diseases.	**10**	3.58
Too many expenses	20	7.17
Calamities	**15**	**5.38**
Presence of astray animals	10	3.58

Table 12. Continued.

PROBLEM	NO.	%
Marketing		
Low price of fruits during peak of harvest	70	25.09
No price control	3	1.08
No buyers during peak of harvest	15	5.38
No transportation facilities	12	4.30
Lack of farm to market roads	10	3.58
High cost of transportation	5	1.79
Impassable roads during peak of harvest	16	5.73
Fluctuation of prices	18	6.45
No pennanent buyer	5	1.79
Businessmen controlled the price of products	8	2.88
Lower buying prices of wholesalers	6	2.15
Lack of buying stations for all kinds of fruits	53	19.00
Technical		
Lack of technical know how	12	4.30
No drip irrigation	3	1.08
Obsolete technical assistance	2	0.72
Lack of knowledge on fruit tree propagation	10	3.58
Lack of technical assistance from DA and TESDA	3	1.08
Soil testing	5	1.79
Price control	2	0.72
Few technicians to assist growers	6	2.15.
No result of soil analysis	4	1.43
Financial		
Lack of capital	39	13.98
High cost of materials & fertilizer	8	2.87
High interest on loans	24	8.60
No capital	3	1.08
Capital came from loans	3	1.08
Very high capital	2	0.72
No creditor	7	2.51
High tax	10	3.58
Difficulty in acquiring loans from banks	10	3.58
Lack of government support	8	2.87
Local government to lend money with low interest	4	1.43

Table 13 presents the suggestions of the fruit-bearing plant growers to solve their problems on the different aspects.

On planting. The primary suggestion was a project on water system followed by the following: procurement of machines for watering, seminar on propagating fruit-bearing plants, more seedlings for sale at low price or give away, technical assistance from the Department of Agriculture, nursery for seedlings, distribution of seedlings to interested fruit growers, contract growing program between government and private sectors, pest and disease control, government assistance for irrigation, discovery of pest-resistant fruit trees, and use of organic fertilizer and practice 1PM.

Table 13. Suggestions for solving the problems met by growers in the different aspects of growing fruit bearing plants.

SUGGESTION	NO.	%
Planting		
Procurement of machines for watering	11	3.94
Seminar on propagating fruit-bearing plants	19	**6.81**
More seedlings for sale at low price or give away	8	2.87
Project on water system	25	**8.96**
Technical assistance from DA	4	1.43
There should be nursery for seedlings.	2	0.72
Seedlings should be distributed to interested fruit growers.	4	1.43
There should be contract growing program between government & private sector.	10	3.58
Pests and disease control	8	2.87
Government assistance for irrigation	2	0.72
Discovery of pest-resistant fruit trees	**4**	1.43
Use of organic fertilizer & practice IPM	16	5.73
Marketing		
Improved price control	7	2.51
Full support from the government	20	7.17
Improved transportation facilities	25	**8.96**
Increased price of fruits	11	3.94
Improved farm to market roads	17	6.09
Assistance from DTI	7	2.51
There should be a ready market for fruits.	8	**2.87**
Support from local government for better market of products	10	3.58
Establishment of food processing plant	12	4.30
There should be more buying stations for fruits.	**8**	2.87
Stable price for products	6	2.15
Coordination among DA, DTI, cooperatives & exporters	12	4.30

Table 13. Continued.

SUGGESTION	NO.	%
Technical		
Seminar on food preservation	24	8.60
Assistance from agricultural technologists	23	8.24
Training on crop protection	21	7.53
There should be a new processing plant.	3	1.08
Technical assistance from the Department of Agriculture	14	5.02
More training/seminars sponsored by experts	16	5.73
Effective pest & disease control	10	3.58
Soil testing	3	1.08
New methods of blooming flowers	4	1.43
Financial		
Loans at low or no interest	45	16.13
Organization of cooperatives	6	2.15
Financial assistance from the government	19	6.81
Assistance from NEDA	8	2.87
Seed capital for cooperatives	16	5.73
Extension of loans/bank services to the remote barangays	15	5.38
Financial support from local organizations	3	1.08
There should be lending institutions that provide loans at lower interest.	11	3.94

On marketing. The following were suggested as solutions to problems on marketing: improved price control, full support from the government, improved transportation facilities, increase in price of fruits, improved farm to market roads, assistance from Department of Trade and Industry, a ready market for fruits, support from local government for better market of products, establishment of food processing plant, more buying stations for fruits, stable price of products, coordination among the DA, DTI, cooperatives and exporters.

On technical. The following suggestions were given by the respondents to solve problems on the technical aspect: seminar on food preservation, assistance from agricultural technologists, training on crop protection, a new processing plant, technical assistance from the Department of Agriculture, more trainings/seminars sponsored by experts, effective pest and disease control, soil testing, and new methods of blooming flowers.

On financial. Provision of loans at low or no interest was suggested by 16.13% of the respondents, followed by organization of cooperatives, financial assistance from the government, assistance from NEDA, seed capital for cooperatives, extension of loans/bank services to the remote barangays, financial support from local organizations, and lending institutions that provide loans at lower interest.

Conclusions

On Profile of Respondents

As expected there were more male than female respondents. Most of them were married and belonged to the age bracket of 31-40 and 51-60 years. Most of them had five to six household members and a monthly income of P1,000 and below. Majority of them claimed that their monthly income was not sufficient for the consumption of their family. Aside from fruit venture, the respondents had other sources of income like farming, animal raising, and working as barangay officials. The average monthly income of household members was P5,000 and below.

On Varieties of Fruit - Bearing Plants

The fruit-bearing plants grown in Ilocos Sur were: banana, calamansi, native mango, pineapple, avocado, rambutan, papaya, coconut, siniguelas, jackfruit, guava, Indian mango, chico, guayubano, atis, camachili, santol, orange, kasoy, star apple, tamarind, pomelo, and blackberry.

The top five fruit-bearing plants grown in the different municipalities were: Alilem (banana, pineapple, avocado, native mango and papaya); Banayoyo (native mango, banana, pineapple, guava, papaya); Burgos (native mango, banana, papaya, coconut, calamansi); Del Pilar (banana, pineapple, native mango, papaya, avocado); Galimuyod (banana, native mango, calamansi, avocado, pineapple); Salcedo (banana, rambutan, calamansi, pineapple, native mango); San Emilio (pineapple, banana, native mango, coconut, papaya); Sigay (banana, pineapple, orange, native mango, coconut); Sugpon (pineapple, avocado, native mango, rambutan, coconut); San Ildefonso (siniguelas, native mango, calamansi, Indian mango, banana); Sinait (native mango, banana, Indian mango, chico, papaya); Sto. Domingo (calamansi, banana, native mango, santol, Indian mango); Candon (coconut, native mango, banana, papaya, guayubano); Sta. Lucia (coconut, native mango, guava, siniguelas, banana); Sta. Maria (native mango, banana, coconut, pineapple, avocado); Tagudin (calamansi, native mango, papaya, coconut and banana).

On Reasons for Engaging in Fruit Business Venture

The respondents' reasons for engaging in fruit business venture are arranged as follows: as a means of earning additional income, own satisfaction, means of livelihood, for recreation, recipient of government support, caretaker, for personal consumption, help maintain clean and green program, recipient of NGO support, next generation's welfare and soil erosion control.

On Market Potentials

The place where fruits were sold are in the following sequence: local market, neighborhood, nearby towns/provinces, other regions, and for export. The buyers of their products were the following: consumers, retailers, wholesalers, food processors, exporters and middlemen. With regards to the status of demand and supply, majority claimed that demand was more than supply.

On the Assessment of the Price of Products

A good number of respondents (45.79%) assessed the price of their products to be "fair" which means that they had little income; some respondents (43.16%) assessed the price of products to be "break even" which means that income was equal to cost; others (36.84%) assessed the price of products to be "low" which means that cost was more than income; few gave their assessment as "high" which means satisfactory income; and very **few** assessed the price of products to be "very high" which means that income was more than 50% of the cost.

On Manner of Selling Products

Mangoes, bananas, and avocadoes were sold both by wholesale and retail; papayas, coconuts, guayubanos, pineapples, chicos, jackfruits, and other fruits were sold by retail although some were sold on wholesale basis.

On the Most Profitable Fruit Business Venture

The top 10 most profitable fruit business ventures in terms of income derived were ranked as follows: first was mango, followed by grapes, rambutan, kasoy, banana, calamansi, tamarind, pineapple, coconut, and avocado.

On Expenses Incurred in Fruit Business Venture

Expenses incurred were categorized into two, namely: production and marketing. In production, the respondents spent mostly on fertilizer, insecticide, labor and seeds. In marketing, they spent mostly on transportation and labor.

On Support Provided by the Government and NGO's

Most of the respondents claimed that the government provided technology and seedlings, while the private sector provided fertilizers and insecticides.

Majority of the respondents claimed that their fruit business venture was self- financed, but they also received financial support from cooperatives.

On technical assistance, in tenns of conduct of seminars, most of the respondents claimed that the Department of Agriculture and the municipal government provided technical assistance.

On Problems Encountered by Growers

In terms of planting, the most common problem the growers met were the following: lack of water supply, expensive seedling, presence of pests and diseases, too many expenses, and presence of calamities.

In terms of technical problems, the respondents encountered lack of technical know how and lack of knowledge on fruit tree propagation.

In terms of financial problems, lack of capital was their first problem, followed by high interest on loans, high tax, and difficulty in acquiring loans from banks.

On Suggestions to Solve the Problems Met

In terms of planting, the suggestions of some respondents were the following: project on water system, seminar on propagating fruit bearing plants, pests and disease control, more seedlings for sale with low price or give away, and existence of contract growing program between government and private sector.

In marketing, the respondents suggested the following: improved transportation facilities, full support from the government, improved farm to market roads, increase in price of fruits during peak of harvest, establishment of food processing plant, coordination among the DA, DTI, cooperatives, and exporters.

In terms of technical aspect, the suggestions given by some respondents were the following: seminar on food preservation, assistance from agricultural technologists, training on crop protection, more trainings sponsored by experts, and effective pest and disease control.

In terms of the financial aspect, several respondents suggested the following: loans at low or no interest, financial assistance from the government, seed capital for cooperatives, and extension of loans/bank services to the remote barangays.

Recommendations

1. Further studies on fruit production and medicinal values of these fruit trees are highly recommended.

2. Through lectures and seminars, the Fruit Research Center of the Bureau of Plant Industry should disseminate new technologies on how to improve the fruit production in Ilocos Sur where R.O.1. (Return of Investment), Postharvest Operations, packaging materials are included.

3. There should be an enhancement program and continuous support of the Ilocos Sur government officials on Tree Planting. Its maintenance and protection should be given attention so that in the next several months a million fruit trees will be planted. In three or five years it will become a model for the other provinces to emulate.

4. The government should fully secure the country's remaining residual forests, logged-over, old growth forests with fruit trees to be planted.

Among the alternative forest destruction, a review of the Annual Allowable Cut (AAC) should be made to reflect the true capacity of the forest to provide timber and food.

The AAC should incorporate the actual capacity of the forest to replace what was removed through logging such that the growing stock in a given license area shall never be diminished but instead to improve and develop for trees in the forests are not only for shelter but sources of food such as fruits, edible leaves etc. that will help maintain the livelihood of the people.

Literature Cited

BILAG, JOSE N. et. al. 1985. *"Assessment of the Performance of Coffee Trees Under Partially-Shaded and Exposed Conditions".* In MSAC Research Journal Vol. 17. Mountain State Agriculture College.

CORONEL, ROBERTO E. 1994. *Promising Fruits of the Philippines.* Los Baiios: UP College of Agriculture Printing Press.

PASCUA, GLICERIA S. and RENE RAFAEL ESPINO. 1999. *'"Promising Carabao Mango Cultivar."* In Agriculture in the Ilocos Volume 1. Batac, Ilocos Norte: Mariano Marcos State University.

PATENA, L. F. et al. 1985. *"Tissue Culture of Banana"* In Research Highlights from the PCARRD Network. Philippine Council for Agriculture, Forestry and Natural Resources Research and Development Los Banos, Laguna: National Science and Technology Authority.