



**BICOL RIVER BASIN COUNCIL**

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**PROJECT PROPOSALS  
1976-1977**

**for  
AGRIBUSINESS DEVELOPMENT**

**VOLUME II**

**PROGRAM OFFICE  
Baras, Canaman, Camarines Sur  
April 1976**

PROPOSAL FOR STUDIES IN AGRIBUSINESS  
AND  
AGROINDUSTRIAL DEVELOPMENT

**I Background and Rationale**

The studies appearing below are directed towards:

- a) investors - that they may have indications of viability of agribusiness enterprises especially commodity-based industries;
- b) planners and policy makers - that they may have sufficient information base to meet the objectives of the agribusiness development program for the Bicol River Basin.

Investments by the private sector in agribusiness and agroindustrial enterprises will support agricultural production as well as develop forward linkages in the Basin economy. Thus, foundations for the development of the secondary sector in the Basin, will have been laid.

Policies and services by the government sector which will help attain these objectives can be recommended from some of the studies indicated below.

**II Projects**

Studies which are "investor-oriented" total eighteen (18). These studies hopefully will lead to immediate investment or at least serious consideration on the part of the private investors on the proposed projects. These studies will be contracted out once funds for them are available. Total estimated cost: P800.9 thousand.

Studies which are "planning and policy making" oriented total seven (7). These studies will guide us in formulating necessary strategies, programs and projects that will support the private sector in attaining the objectives of the program. It is anticipated that these projects will cost P1,234.729 thousand. These studies will be undertaken by the usual mechanism of inter-agency study groups.

### III Outputs

- A. Pro-forma Feasibility studies on the following areas:
- a. Geothermal Processing of Salt
  - b. Integrated Slaughterhouse and Cold Storage Complex
  - c. Wax and Candle Factory
  - d. Wallboard from Ricestalks
  - e. Rice hull bricks
  - f. Feedmilling
  - g. Tannery
  - h. Sugar by-products processing (Molasses)
  - i. Bagasse Pulp and Paper Processing
  - j. Coconut coir and Wallboard
  - k. Coco Oil (Wet process)
  - l. Cassava Flour
  - m. Citrus juice extraction
  - n. Sacks from Abaca
  - o. Agricultural lime
  - p. Cement
  - q. Abaca Pulp & Paper
  - r. Bran Oil Extraction
  - s. Integrated Fish Processing Plant.



	Year		1976				1977							
	Quart. r		3rd		4th		1st		2nd					
	Months	0	1	2	3	4	5	6	7	8	9	10	11	12
7. Rice hull bricks								x						
8. Molasses by-product					x									
9. Bagasse Pulp & Paper					x									
10. Coconut Coir and Waliboard					x									
11. Coco Oil (Wet Process)					x									
12. Cassava Flour					x									
13. Citrus juice extraction					x									
14. Sacks from Abaca					x									
15. Agricultural lime					x									
16. Cement								x						
17. Abaca Pulp & Paper								x						
18. Bran Oil extraction								x						
19. Integrated Fish Processing Plant								x						
B. 1. Market Demand								x						
2. Sub-sector Account									x					
3. Agricultural/Agroindustrial Credit					x									
4. Warehousing								x						
5. Cold Storage System								x						
6. Agricultural Supply System								x						
7. Post Harvest Equipment Profile						x								
C. 1. Organizational Plan								x						
2. Terms of References Iden- tified Projects								x						

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PROPOSAL FOR STUDIES IN AGRIBUSINESS  
AND AGRO-INDUSTRIAL DEVELOPMENT  
IN THE BICOL RIVER BASIN

**I** Background and Rationale

Investment potentials in the agribusiness and agro-industrial sector have to be identified to attract investors in areas considered economically desirable from the standpoint of attaining the objectives of the BRBDP.

Similarly, government services to this sector such as: Policy-making (e.g. investment incentive schemes) and providing information have to be specified and coordinated to attain an effective government-private sector link-up. Study areas to attain this mechanism, at this stage, need identification.

In the factors (non-labor) market of the agricultural sector, stability of prices and volumes is desirable in order to help attain the targets of agricultural production of the BRBDP. Identifying these areas for investments in the factor markets to as great a number of investors as possible, will hopefully achieve the targeted input requirements of the agricultural sector as well as create the necessary competitive condition in the market to stabilize, if not lower prices. It may become necessary to study or review some government policies and programs affecting this area of market activity. These areas still have to be identified.

In the consumer markets, both household and industrial, new markets and new products and their necessary processes have to be identified both for the farm and business sector of the basin economy. This is one strategy if we are to offset seasonal dips in income of the farm sector, brought about by seasonal surpluses in agricultural production. Requirements in storage, warehousing and transport facilities have to be identified; as well as support processing requirements such as slaughtering and grain milling. It may become necessary on the government side to study policies for encouraging investments in these forward-linkage areas of agricultural production. In like manner, government servicing capability in these areas may have to be expanded.

The studies specified below address these two (2) macro-economic market areas and were originally indicated in the pre-program phase of the Agribusiness Development Program. Some Study areas may still be spun-off from the program formulation process.

## II Objectives

### General

The one year studies program will formulate a comprehensive development program for agribusiness and agro-industrial development.

Specific

Specifically, it will identify the project components of the program such as:

1. Feasibility studies to be undertaken;
2. Pre-feasibility studies to be undertaken;
3. Policy studies;
4. Other economic studies within the sector;
5. Projects that will upgrade capabilities of both government and the private sector;
6. Recommend an organizational plan that will effectively carry out promotions, project development and technology transfer, and policy making; and
7. Undertake the studies for identified projects specified below.

III Scope of Work

Areas of Studies

1. The studies will cover the agribusiness sector of the Basin economy. The sector is defined as that which buys, for resale or processing, agricultural commodities; and that which sells support facilities, services and products to the agricultural sector; and processing itself of agricultural commodities and its by-products.

2. Agricultural commodities will cover crops, livestock and fisheries as identified in the Agricultural Development Program of the BREDDP.

### Work Process

1. Resource Assessment

The objectives of the resource assessment phase is to determine the current capabilities of systems within the agribusiness sector to absorb inputs and produce outputs.

The highlights of the process are:

- a. Valuation of subsector economic productivity 1970 and 1975

These will provide important macro-economic figures on sizes of sales, investments, employment, margins, inventory changes, value added for each industry within the subsector.

- b. Identify gaps in factor and consumer markets

These will provide information on the potential size (in volume and value term) of the sales potentials for investors to fill in, at least on the maximum.

- c. Review of policies, laws and regulations

This cursory study will provide insights into current governmental control on the private

enterprise and the operational effectivity of control. This will especially deal on the Investment Incentive Law, Price Control, Business Ownership and Location requirements.

d. Survey of line agencies capabilities

The survey will provide information on existing programs, projects and functions of different line agencies involved with enterprise development and operations, the number of personnel and qualifications. In short their capability locally to provide current and projected service demands from the private sector.

e. Assessment of current support facilities and technology

These will provide information on current capacities and capacity usage ratios, of existing cold storage, warehousing, milling, slaughtering and transport facilities. There will also be an approximation of potential maximum size of requirements for these facilities especially with increased agricultural productivity.

2. Investigation of Potentials

The broad objective of the process, though linked intricately with the first process, is to de-

velop alternative solutions/projects to problem and constraints that hamper the efficient flow of output among systems within the sector. And, to identify untapped potentials for increased productivity.

Specifically the process would:

- a. Quantify market potentials for raw commodities, its by-products, processed food, and other forward and backward linkage. This would develop alternative proposals for concrete business projects.
- b. Quantify potentials in processing (both commodity and export) and the results of introduction of improved technology. This would also develop alternative proposals for concrete business projects.
- c. Develop alternative proposals for policy study areas in pursuit of optimal location patterns, broad-based ownership, investment incentive schemes, economic studies. In general, the alternative proposals would assist the government in formulating a package of policies and services to assist the farm and business sector.
- d. Develop alternative proposals for organizing and

managing the implementation of the studies, project development and technology transfer, investment promotions and policy formulation.

3. Identification of Potential Projects

This phase is the logical conclusion from the process of project selection from alternatives developed earlier. In addition, this will rank and schedule prosecution of project priorities which are to be the components of the comprehensive program.

Two (2) types of activities fall under this category:

- a. Selection of most acceptable proposal for studies and business projects to be promoted including promotional plans, and;
- b. Selection of most acceptable recommendations for mechanism in prosecuting the program.

Outputs and Tasks

A. Assesemnt of Resources and Investigation of Potentials

<u>Task/Activity</u>	<u>Output</u>
1.a) Economic study of census data 1970	1.a) Values and volumes of levels of investment, value added, employment, sales margins, inventory changes of 1970 and 1975.
b) Evaluation of business establishments survey of SSRU, 1975.	b) Coefficient of productivity of capital and labor.

- |  |  |
|--|--|
| 2.a) Review and evaluate estimates of production and consumption.  | 2.a) Consumption patterns by municipality, by season, projected.   |
| 3.a) Evaluate terms of reference for proposed market demand.   | 3.a) Market absorption patterns (Basin) by municipality, by season, projected.   |
| 4.a) Evaluate terms of reference for proposed credit study and develop alternative project prototypes.             | 4.a) Credit requirements for agribusiness, agro-industry and farm sector.  |
| b) Review and evaluate estimates of input requirements and develop alternative project prototypes.                 | b) Volume and value of inputs requirements; crops, livestock and fisheries.  |
| c) Estimate and develop alternative project prototypes.  | c) Volume and value of farm machinery requirements including post harvest machinery.   |
| d) Review estimates and develop alternative project prototypes.  | d) Requirements for support facilities and processes: <ol style="list-style-type: none"> <li>1. Slaughtering</li> <li>2. Rice Milling</li> <li>3. Cold Storage</li> <li>4. Warehousing</li> <li>5. Transport</li> <li>6. Power Requirements</li> <li>7. Land, Space/Location Requirements</li> </ol> |
| 5.a) Survey, evaluate, and develop alternative recommendations.  | 5.a) Inventory of programs functions of related line agencies, number of personnel and their qualifications.   |
| b) Develop scope of work and terms of reference for the study and analyze and develop alternative recommendations. | b) Inventory of laws, regulations affecting business and industry establishment and operations.  |

- e) Computer simulation of alternative projects on overall effects to BRB-DP targets and objectives.
- c) Identification of most promising project prototypes.

**B. Identification of Potential Projects**

<u>Task/Activity</u>	<u>Output</u>
1.a) Identify most promising alternative of study design and concepts for feasibility, pre-feasibility, policies, economic and data generation projects.	1.a) Terms of reference scope of work and cost estimates.
2.a) Feasibility analysis utilizing feasibility analysis program of Dr. Philips.	2.a) Identified business project with high profitability potential.
b) Survey and gather data on identified potential business project, technical viability, financial and market potential estimates.	b) Prototype business project for feasibility analysis.
c) Terms of reference, scope of work for study of most promising study design and concept.	c) Survey and gather data for projects.

**C. Implementation of Identified Projects**

The proposals attached herewith (Appendices) are projects identified for study or survey.

In summary these projects are:

<u>Projects</u>	<u>Responsibility</u>
1. Geothermal Processing of Salt	Contractor
2. Integrated Slaughterhouse & Cold Storage Complex	-do-
3. Feedmilling	-do-

4. Tannery in Pasacao	-do-
5. Wax and Candle Factory	-do-
6. Wallboard from Ricestalks	-do-
7. Rice Hull Bricks**	-do-
8. Sugar by-products	-do-
9. Bagasse Pulp and Paper	-do-
10. Coconut Oil (Wet Process)	-do-
11. Coconut Coir and Wallboard	-do-
12. Cassava Flour	-do-
13. Citrus Juice Extraction	-do-
14. Sacks from Abaca	-do-
15. Agricultural Lime	-do-
16. Cement	-do-
17. Abaca Pulp and Paper**	-do-
18. Bran Oil Extraction	-do-
19. Integrated Fish Processing Plant	-do-
20. Market Demand	Inter-Agency Study groups (non-contract)
21. Subsector Accounts**	-do-
22. Agricultural/Agro-industrial Credit	-do-
23. Warehousing Systems	-do-
24. Agricultural Supply Systems**	-do-
25. Cold Storage Systems	-do-
26. Post Harvest Equipment Industry Profile	-do-

(NOTE: \*\* Proposed Terms of References for these projects are not included in this document)

For projects still to be identified by the program formulation process, implementation maybe channelled to a mechanism which will be recommended by the program of formulation

group.

#### IV Strategy of Implementation

Two (2) distinct phases of planning is proposed to occur simultaneously. These are: a) the formulation of the program proper itself including the project identification process; b) conducting studies on projects already identified. This approach was utilized to reduce the time involved in the planning process.

The first activity of the process will have a timetable of no more than six (6) months and will be undertaken jointly by an inter-agency counterpart team and foreign consultants. This group shall assess and investigate investment potentials in agribusiness and agro-industries including export processing.

The second activity of the process will have a timetable of approximately a year. In view of the number of projects identified, it is proposed that some projects be undertaken by the private sector on contract. It is recommended that a single contractor undertake these studies. On some projects, the usual mechanism of memoranda of agreements among participating line agencies will be developed. The organizational and manpower charts appear in Annex B.

#### V Budgetary Requirements

1. Program Formulation Process

Incentive Allowances	P 63,600.00
Salaries and Wages	88,200.00
Traveling Expenses	147,360.00
Supplies and Materials	63,689.00
General Operations	124,520.00
Equipment Outlay	<u>347,360.00</u>
T O T A L	P834,729.00
Foreign Consultants Fee	\$ 75,000.00

2. Conduct of Studies

a. <u>Studies for Contract</u>	<u>Estimated Cost (000)</u>	<u>Duration Months</u>
1. Geothermal Processing of Salt	P 35.0	3
2. Integrated Slaughterhouse and Cold Storage	20.0	3
3. Feedmill	20.0	3
4. Tannery in Pasacao	50.0	4
5. Bran Oil Extraction	25.0	3
6. Wallboard from Rice Stalks	20.0	3
7. Rice Hull Bricks	20.0	3
8. Abaca Pulp and Paper	15.0	3
9. Integrated Fish Processing Plant	75.9	3
10. Molasse by-product	84.5	6
11. Bagasse by-product	50.0	3

V 0-13

12. Coconut Coir and Wallboard	35.0	3
13. Coco Oil (wet process)	35.0	3
14. Wax and Candle	25.0	3
15. Cassava Flour	35.5	3
16. Citrus Juice Extraction	35.0	3
17. Sacks from Abaca	20.0	3
18. Cement	150.0	6
19. Lime	<u>50.0</u>	3
Sub-Total	800.9	

b. <u>Studies for Non-Contract</u> <u>(Inter-agency Study)</u>	<u>Estimated</u> <u>Cost</u> <u>(000)</u>	<u>Duration</u> <u>Months</u>
20. Agricultural and Agro- industrial Credit Study	40.0	4
21. Warehousing Systems	25.0	3
22. Subsector Accounts	85.0	3
23. Market Demand	115.0	6
24. Supply Systems	60.0	3
25. Cold Storage Systems	50.0	3
26. Post Harvest Equipment Profile	<u>25.0</u>	3
Sub-Total	400.0	

3. Total Budgetary Requirements

	P	\$
a. Program Formulation Process	834,729	75,000
b. Contract Studies	800,900	-

c. Non-Contract Studies	<u>400,000</u>	<u>-</u>
	P2,035,629	\$75,000

4. Source of Funds

It is anticipated that the foreign exchange requirements will be secured by a technical assistance grant from USAID/Washington. It is proposed that the peso counterpart for the program formulation process be obtained from NEDA PL 480 funds. The funds for contract and non-contract studies will be secured from different line agencies.

VI Consolidated Bar Chart of Activities and Funds Flow Requirements

M O N T H S	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
QUARTER				3			4			1				2	
Y E A R				1 9 7 6							1 9 7 7				

A. Contract Studies

1. Salt	XXXXXXXXXXXXXXXXXX
2. Slaughterhouse	XXXXXXXXXXXXXXXXXX
3. Feedmill	XXXXXXXXXXXXXXXXXX
4. Tannery	XXXXXXXXXXXXXXXXXX
5. Wax and Candle	XXXXXXXXXXXXXXXXXX
6. Wallboard Ricestalk	XXXXXXXXXXXXXXXXXX
7. Rice Hull Bricks	XXXXXXXXXXXXXXXXXX
8. Molasses by-product	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
9. Bagasse Pulp and Paper	XXXXXXXXXXXXXXXXXX
10. Coconut Coir and Wallboard	XXXXXXXXXXXXXXXXXXXX
11. Coco Oil (wet process)	XXXXXXXXXXXXXXXXXXXX
12. Cassava Flour	XXXXXXXXXXXXXXXXXXXX
13. Citrus Juice Extraction	XXXXXXXXXXXXXXXXXXXX
14. Sacks from Abaca	XXXXXXXXXXXXXXXXXXXX
15. Agricultural Lime	XXXXXXXXXXXXXXXXXXXX
16. Cement	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
17. Abaca Pulp and paper	XXXXXXXXXXXXXXXXXXXX
18. Bran Oil Extraction	XXXXXXXXXXXXXXXXXXXX
19. Integrated Fish Processing	XXXXXXXXXXXXXXXXXXXX

V 0-16

M O N T H S	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
QUARTER				3			4			1			2		
Y E A R	1 9 7 6						1 9 7 7								

B. Non-Contract Studies

20. Market Demand	XXXXXXXXXXXXXXXXXXXXXXXXXXXX
21. Subsector Account	XXXXXXXXXXXXXXXXXX
22. Agricultural/Agro-Industrial Credit	XXXXXXXXXXXXXXXXXX
23. Warehousing System	XXXXXXXXXXXXXXXXXX
24. Cold Storage System	XXXXXXXXXXXXXXXXXX
25. Agricultural Supply	XXXXXXXXXX
26. PH Equipment	XXXXXXXXXXXXXXXXXX
27. Program Formulation	XXXXXXXXXXXXXXXXXXXXXXXXXXXX

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VII Organization and Management

In order to implement the strategy cited in Section IV, an organizational plan is illustrated in Exhibit 1, Annex B, below.

The program of studies will be coordinated in the overall by BRBC. This appears on the bottom half of the diagram. For program formulation, two teams will be collaborating headed by their respective coordinators; one for an inter-agency team, and one for the foreign consultants' group. An agribusiness staff within the BRBC-PC structure will be created to render support services both for these two teams. This staff shall also assist the coordinator in the administration of both contract and non-contract studies.

Contract and non-contract studies will have their respective study coordinators which shall be directly responsible in prosecuting the studies. The BRBC Project Coordinator shall monitor and evaluate the progress of these study teams. In like manner, the project coordinator shall also monitor and evaluate the progress of the program formulation process.

The upper portion of Exhibit 1 shows the "authority" basis of the project coordinator's action. The three screening committees (requalification, bidding and awards committees) shall deliberate on the awarding of contract studies.

The steering committee shall provide the necessary policy support and national perspective in undertaking the program. On the local level, this committee has a "counterpart" in the management coordinating committee through the subcommittee on agribusiness and industry. The latter has already been organized. Annex A, pages 1 and 2 details the Manpower Requirements. Annex B, Exhibit 2 is an illustration of the distribution of the manpower required.

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Annex AORGANIZATIONAL STAFFING REQUIREMENTS

<u>Foreign Consultants</u>	<u>Phase</u>	<u>Man-months</u>	<u>Source</u>
1 Industrial Economist	1st 6 months	4	PIO/T
1 Marketing Consultant	1st 6 months	4	PIO/T
1 Financial Consultant	1st 6 months	3	PIO/T
1 Coconut Consultant	1st 6 months	1	PIO/T
1 Sugar Consultant	1st 6 months	1	PIO/T
1 Abaca Consultant	1st 6 months		
1 Trade Consultant	1st 6 months	3	PIO/T
1 Cold Storage Consultant	1st 6 months	3	PIO/T

ORGANIZATIONAL STAFFING REQUIREMENTS

<u>Agribusiness Staff</u>	<u>Phase</u>	<u>Man-months</u>	<u>Source</u>
1 Project Coordinator	throughout	12	BRBC
1 Project Analyst	"	12	BRBC
1 Market Analyst	"	12	PCV
1 Finance Analyst	"	12	BRBC
2 Accounting Clerks	"	12	Hire
4 Researchers	"	12	BRBC
4 Clerk/Typist	"	12	Hire
1 Secretary	"	12	Hire
2 Clerk/Typist	"	12	Hire
1 Programmer	"	12	DA
1 Key-puncher	"	12	DA

Contractors' Study Team (Please refer to attached Terms of References)

Non-Contractors' Study Team (Please refer to attached Terms of References)

<u>Inter-Agency Counterpart Team</u>	<u>Phase</u>	<u>Man-months</u>	<u>Source</u>
1 Coordinator	1st 6 months	6	BRBC
1 Agribusiness Consultant	"	6	UPLB-TAG
1 Economist	"	6	NEDA
1 Market Analyst	"	6	DOT
1 Industrial Analyst	"	6	BI
2 Scientist	"	6	NSDB
1 Agricultural & Industrial Credit Specialist	"	6	CB
1 Investment Promotion man	"	6	BOI
1 Project Analyst	"	6	BRBC
1 Corporate Law Consultant	"	6	Hire
2 Representative from Private Sector	"	6	Mla. & Loc.
1 Financial Analyst	"	6	BRBC

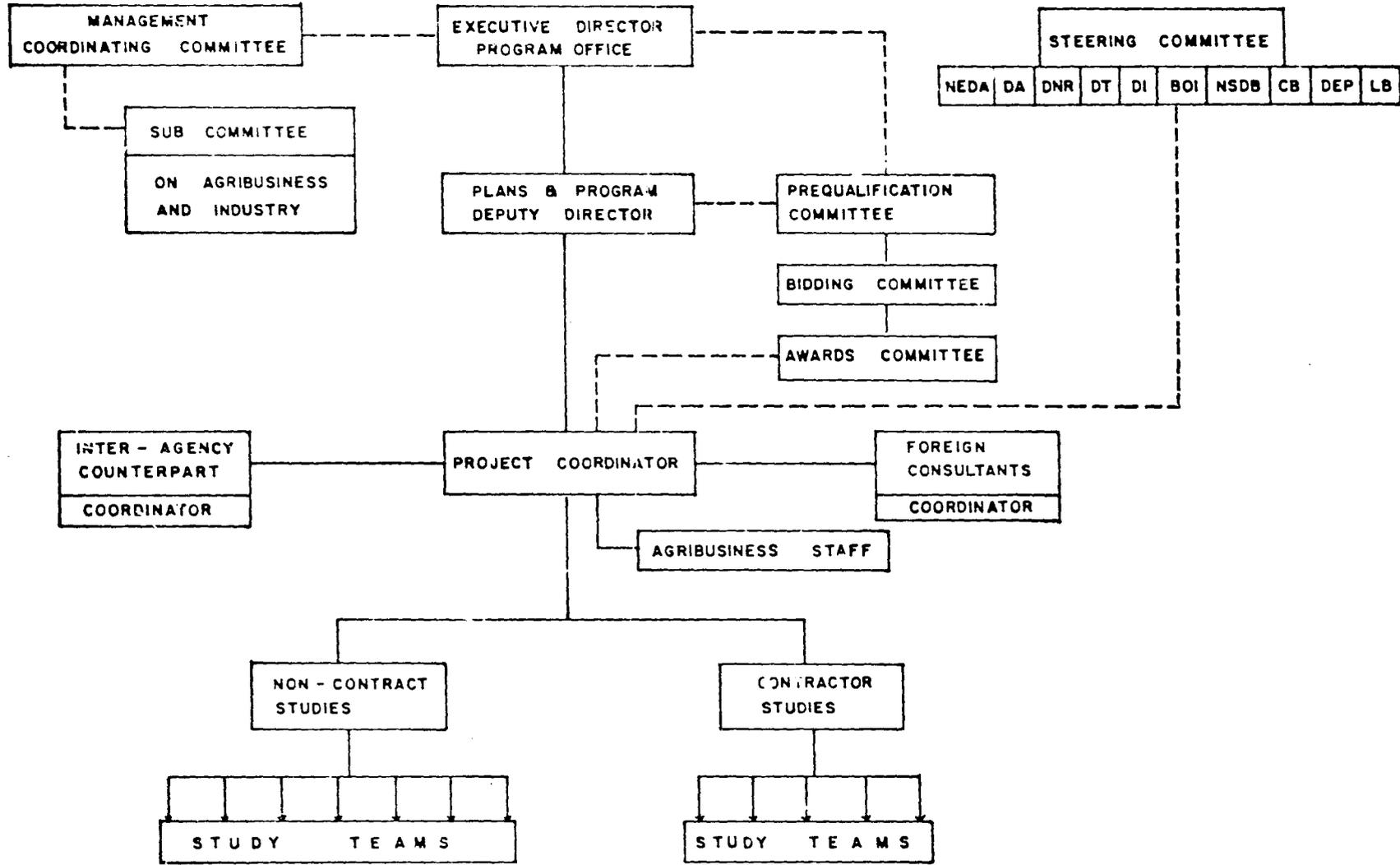


EXHIBIT - 1

AGRIBUSINESS and AGROINDUSTRIAL DEVELOPMENT  
 ORGANIZATIONAL CHART  
 1976 - 1977

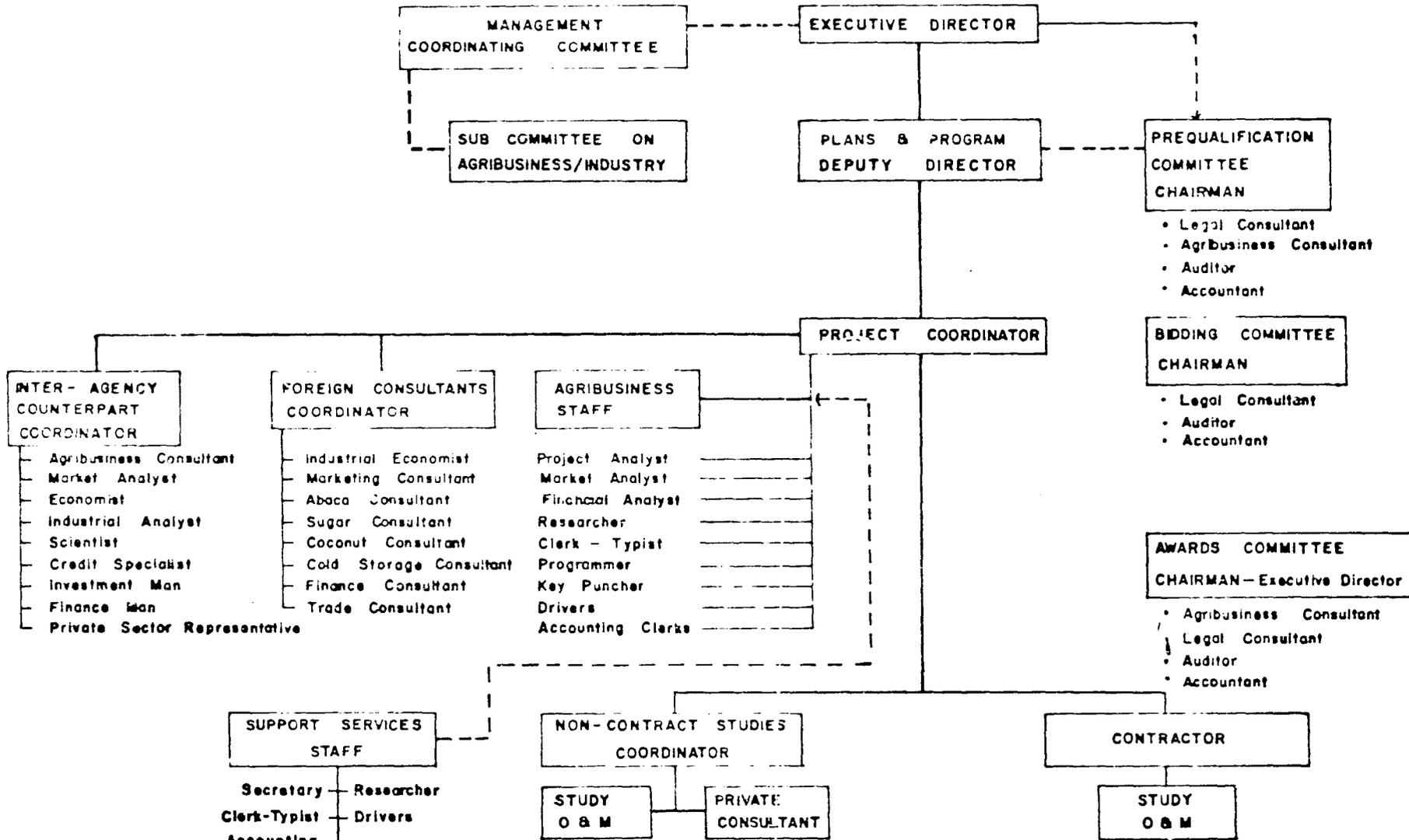


Exhibit 2

AGRIBUSINESS & AGROINDUSTRIAL DEVELOPMENT  
MANPOWER CHART

1975-77

ANNEX C: FUNDS FLOW REQUIREMENTS (Y000)

YEAR Quarter Months	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	TOTAL
<b>A. <u>Contract Studies</u></b>															
Monthly			66.92	66.29	66.79	38.30	58.23	58.23	125.26	112.69	112.69	25.00	25.00	25.00	
Quarterly					<u>200.50</u>			<u>174.76</u>			<u>350.64</u>			75.00	800.9
<b>B. <u>Non Contract Studies</u></b>															
Monthly			29.20	29.16	29.16	62.52	52.48	52.48	48.34	48.33	48.33				
Quarterly					<u>87.52</u>			<u>167.48</u>			<u>145.00</u>				400.00
<b>C. <u>Program Formulation</u></b>															
Monthly	139.15	139.11	139.11	139.11	139.14	139.1									
Quarterly		<u>278.3</u>			<u>556.429</u>										834.729
<b>T O T A L</b>															
Monthly	139.15	139.11	235.23	235.06	235.06	259.93	710.71	110.71	173.76	161.02	161.02	25.00	25.00	25.00	
Quarterly		<u>278.3</u>			<u>844.449</u>			<u>342.24</u>			<u>495.64</u>			<u>75.00</u>	2,035.629

## RICE BRAN OIL EXTRACTIO

### I. RATIONALE

Rice bran, the chief by-product in rice milling is essentially used as feedstuff for poultry and livestock. Its high nutrient content and availability makes it a desirable material for feed mixers

Basically there are about three types of rice bran produced. Two of which is produced by the cono mill, a  $D_1$  and  $D_2$  type, and that which is produced by the kiskisan mill. The  $D_1$  type is finer and has more nutrients than the  $D_2$  type while the kiskisan type is about the same texture as the  $D_2$  except it has less nutrients.<sup>1/</sup>

Estimates show that cono mills produce about 12 kg.  $D_1$  and 6 kg.  $D_2$  type for every 100 kg. of palay it mills, while the kiskisan type produces about 30 kgs. of bran for every 100 kg. it mills.<sup>2/</sup>

Further estimates show that about 55% of the total palay produced in Camarines Sur is milled by the cono mill while 45% is milled by the kiskisan mill.<sup>3/</sup>

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1/  $D_1$  has 12% crude protein and 6.7% fat,  $D_2$  has 6.8% crude protein and 5% fat while kiskisan has 5% crude protein and 5% fat from proximate feedstuff analysis, Animal Nutrition Laboratory UPCA, 1972

2/ Actual mill observation, CO-Say Rice Mill, Pili, Camarines Sur

3/ Agribusiness survey in Camarines Sur, 1973

However, because of the seasonality of milling, a large volume of bran is produced during the harvest season and relatively small amount during the lean months.

Furthermore, because of the relatively small demand of the product by local feed millers, a large amount of locally produced rice bran are shipped to Metro-Manila feed millers because rice bran cannot be stored for a long time, 2 weeks at the most, since it turns rancid, making it unsuitable as animal feeds.

With this view, an alternative use of the product other than feedstuff has to be looked upon to utilize available surplus, generate additional value added and provide opportunities for employment.

One such alternative is a rice bran oil extraction plant which could accommodate not only surplus but, also provide a continuous market for the commodity.

## II OBJECTIVES

### A. General Objectives

1. To assess the technical, economic, and financial viability of the project
2. To determine availability of raw materials
3. To determine the influence of the facility on other enterprises using the same raw materials.

B. Specific Objectives

1. To determine optimum plant size and site.
2. To determine cost of machinery including financial requirements and annual operational cost.
3. To assess and locate market potentials for the product.
4. To determine competitive effect of facility on other enterprises.
5. To identify industry linkages that could affect employment and income
6. To determine economic benefits of the facility.

III PROJECT DESCRIPTION

A. Scope of Work

The study will determine the technical and economic viability of the project. It should include, however, social implications and financing requirements. Other items that should be looked into, are:

1. Ecological effect of the project
2. Estimate of market demand
3. Identification of product utility
4. Technological process and problems

In addition, the study should include effect on the economy of the area, and health of the employees.

The study should also be able to:

1. Determine the economic viability, using Benefit-Cost Ratio and the IRR method;
2. Identify the site and the optimum plant size, including cost of machinery, construction and operation;
3. Quantify the social and economic benefits to the area.

B. Schedule of Work and Output

To provide comprehensive information, this study has been divided into Engineering, Economics and Socio-Economics.

Corresponding activities and outputs are shown below:

	<u>Schedule</u>	<u>Activity</u>	<u>Output</u>
A. Engineering			
	1 week	1. Machinery Evaluation-	comparative assessment of machineries, size, capacities, basic machinery cost, operational cost, power :
	1 week	2. Technological Study -	assessment of the technological process with emphasis on extraction process, and machinery efficiency including

fuel economy and possible innovation uses of by-products.

B. Economics

2 weeks

1. Supply Study

-

present and future volume of raw materials available.

1 month

2. Demand Study

-

present and future demand of raw materials including effects of competitive industry with and without the project.

1 month

3. Product Study

-

identified present and future uses, including possible by-products and competitive products.

1 month

4. Market Study

-

present and future market utilization of the product and possible behavior including prices, product presentation and packaging and marketing strategies.

C. Socio- Economic

1 month

-

effects of the project on health of workers, generation of job opportunities and the effect on income.

## D. Ecology

2 weeks

- effects on population  
flora and fauna of waste  
product.

The engineering study should be translated into machinery selection and cost of related facilities. A program of operation should also be included.

Economic analysis using net internal rates of return and value added to GRP should be the output of the economic study.

The entire pre-feasibility study including report writing is estimated to be completed in 3 months time.

## IV. REQUIREMENTS

A. Manpower

	<u>Position</u>	<u>Man-Months</u>	<u>Agency</u>
1	Study Coordinator/Economist	3	BRBC
1	Study Director/Industrial Engineer	3	NIST
1	Market Analyst	2	BRBC
1	Financial Analyst	1	BRBC
1	Civil Engineer	1	NIST
1	Chemical Engineer	1	NIST
1	Agronomist	1	BRBC
1	Rice Milling Expert	1	NGA
2	Research Assistants	3	Direct Hire
1	Clerk/typist	3	Direct Hire

B. Budgetary Estimate

The entire study is estimated to cost about P25,000.00

Salaries/Honoraria	P9,000.00
Travelling Expenses	5,000.00
Supplies & Materials	6,000.00
Gasoline & Oil	3,000.00
Sundries	<u>2,000.00</u>
TOTAL .....	P 25,000.00

V. IMPLEMENTATION STRATEGY

The study should be contracted to a private contractor who possess the necessary qualifications or to a government agency like the NIST. If no contractor is found, a multi-agency study team shall be organized to do the task. In all cases, the study shall be coordinated by a BRBC study coordinator from its agribusiness staff.

A memorandum of agreement by and among the different agencies concerned will be signed, which shall define the terms and conditions of the study.

A FEASIBILITY STUDY OF COCONUT OIL PROCESSING  
(A Study Proposal)

I RATIONALE

In the search to find new ways to process copra, a new process has been found that could be utilized to provide better results than the present processes. It now must be determined whether it is feasible to introduce a second plant, using the new process, into the region. If the process is adaptable to the region, it must then be determined if raw materials are available and if they are in sufficient quantity to justify the construction of a plant in the region. The way to determine this is through a thorough feasibility analysis.

The problem that can be solved here is to meet the need for a more efficient process to produce a low-cost oil that can compete with vegetable oil on the world market. What must be considered is the desirability of using this system and the impact of introducing this new system in the area.

The present facility in Legazpi, using an older type processing system, would provide the principal competition for the new system. What the new system would accomplish is to produce oil at a substantial saving in labor which would cut costs. This fact should allow the new system to compete favorably with the older system in Legazpi.

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The beneficiaries of this project would be the processors through its profitable operation and the farmers would benefit through decreased labor costs. The feasibility study would quantify these impacts thus allowing a decision to be made in the introduction of the system.

The importance of coconut exports to the Philippines can be easily seen by the dramatic increase in exports of coconut products reported by the Philippine Coconut Authority in 1974-1975. Despite a substantial price decrease, coconut oil exports still increased by 15.6% to 334.2 million dollars. If the industry continues to grow at this rate, it can plainly be seen that additional processing facilities will be needed, especially when one considers that present facilities are running at 81.2% of rated capacity.\*

### II OBJECTIVE

To determine the economic, financial, and technical viability of the new process.

### III PROJECT DESCRIPTION

#### A. SCOPE OF WORK

##### Engineering

1. Analyze processing methods to thoroughly evaluate system operations.

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\* Annual Report, Philippine Coconut Authority, 1974-1975.

2. Determine equipment needs and locate possible sources of supply and costs of equipment.
3. Determine optimum plant size considering raw materials available and equipment needs.
4. Design plant to meet the needs of the area, including layout and product flows.
5. Determine raw material needs and estimated cost; also, determine area from which supplies come.
6. Compute the total plant costs, including all facilities required for plant operation.

Economics

1. Estimate market size and location of principal markets and whether they are export or local.
2. Estimate market price based on past trends, taking into account the present situation and future trends.
3. Determine optimal plant location, taking in account all factors which affect plant location, including social and economic factors.
4. Estimate total number of employment opportunities that would be generated by the project both in the primary and secondary sectors.
5. Compute Balance Sheet, Income Statement, and Cash Flow Statement for five years ahead using a high, low and medium assumption.

6. Develop a complete financial analysis, including break even analysis, benefit cost, and internal rate of return.

B. SCHEDULE OF WORK

	Duration
1. Market Study	1 month
2. Location analysis	2 weeks
3. Design plant	2 months
4. Compute raw material needs and cost	2 weeks
5. Compute production cost, including unit costs	1 week
6. Compute total project cost	1 week
7. Determine number of workers needed and skills required	1 week
8. Compute Balance Sheets, Income Statements and Cash Flows	1 week
9. Prepare a complete financial analysis	1 week

Estimated total project time of three (3) months.

IV REQUIREMENTS

A. MANPOWER

- 1 Study Coordinator/Economist
- 1 Market Analyst
- 1 Industrial Engineer
- 1 Financial Analyst

- 1 Agronomist
- 3 Researchers
- 2 Clerk/Typists

B. BUDGETARY

Salaries	P26,400.00
Travel and per Diems	5,000.00
Supplies & Contingency	<u>3,600.00</u>
TOTAL COST	P35,000.00

VII IMPLEMENTATION STRATEGY

Alternatives Available

- 1. Contract to consulting firm
- 2. Delegate to line agency
- 3. Coordinate BRBC Staff and line agency

Selection - Based on alternatives available, and resources at hand, the best alternative is to sub-contract the study out to a private consulting firm with the capability to handle the study. This alternative requires the least staff support by the BRBC thus allowing the staff to concentrate on other projects.

## SACK PRODUCTION FROM ABACA FIBER

### I. RATION LE

Abaca, the leading fiber plant in Camarines Sur in terms of area and production, is known world-over for its quality. However, because of the high demand for fibers by the cottage industry, about 90% of A and D grades of the province production is exported to Albay where most of the cottage industries are located. However, for the lower fiber grades such as E<sub>2</sub> downwards to UK demand is nil.

Such quality however, could still be used in the production of sacks and related industry rather than left without a market. Establishment of a sack making plant using low grade abaca fibers would not only utilize available raw materials but would enable planters and workers in the industry to earn additional income.

Production would encourage and users to avail themselves of the products since they could be assured of a continuous supply.

Prior to the appearance of synthetic fiber, jute and other fiber plants were used in the production of sacks. However, because of the low price of sacks of synthetic origin, users particularly millers and processors opted for this type.

Recent increase in prices of fuel, however, has brought a corresponding increase in prices of synthetic sacks and the proliferation of low quality materials that could not stand up to the demand of end users. Besides being easily worn-out, synthetic fiber prevents aeration and present problems in handling and stock piling because of the slippery nature of the fiber. Thus end users have increased the demand for sacks of plant based fiber.

## II. OBJECTIVES

1. To determine the technical feasibility of utilizing low grade fibers for sack manufacturing.
2. To evaluate the economic and financial viability of the project.
3. To study market potential of the product.

## III. PROJECT DESCRIPTION

### A. SCOPE OF WORK

The study will determine the technical and economic viability of the project. It should include social benefits and financing requirement. Other items it should consider are:

1. Identification of product utility
2. Technological process and problems
3. Machinery and equipment necessary
4. Social and economic benefits

The Study should also be able to:

1. Determine the project's economic viability using Benefit Cost ratio and the IRR method.
2. Identify and determine the plant site, size and machinery including basic machinery cost, construction cost and operational cost
3. Quantify the net socio-economic benefits to planters, laborers and the province in general.

**B. SCHEDULE OF WORK**

To provide the necessary information, the study has been divided into Engineering, Economics and Socio-Economic. Below is the chart showing activity, output and estimated period of time needed for particular phase:

<u>ACTIVITY/SCHEDULE</u>	<u>DURATION</u>	<u>OUTPUT</u>
<b>A. Engineering</b>		
1. Machinery Evaluation	1 week	- comparative study of machineries needed in the production of sacks,

production capacity and cost, power source & alternative sources.

2. Technology Study            1 month - detailed assessment of the process of production with emphasis on problem and possible innovations.

B. Economics

1. Supply Demand Study        2 weeks - present and future volume of raw materials with and without the project including the demand by other competitive industry such as the pulp and paper industry and its possible influence on the project.

2. Market Study                1 month - present and future utilization of the product, price projections, marketing strategies and possible behavior of competitive products and its effect on the project, alternative uses should also be included.

3. Socio-Economic                      1 month - possible influence of the project on employment, income and health of factory workers.

The engineering study should be translated into machinery selection, basin cost, cost of related facilities and operational cost.

The economic study using net internal rates of return and benefit cost ratio should be able to determine viability of the project and locate the best site.

The entire pre-feasibility study including report writing is estimated to be completed in 3 months time.

IV REQUIREMENTS

A. MANPOWER

<u>Position</u>	<u>Man-Months</u>
1 Study Coordinator	3
1 Agronomist	1
1 Mechanical Engineer	1
1 Industrial Engineer	2
1 Civil Engineer	1
1 Agricultural Economist	3

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1 Economist	3
2 Researchers -Direct Hire	3
1 Clerk/Typist - Direct Hire	3
1 Driver - Direct Hire	3

B. BUDGETARY ESTIMATE

Salaries/Honorarium	P12,500.00
Traveling Expenses	3,000.00
Supplies and Materials	3,000.00
Gasoline and Oil	1,500.00
Contingencies	<u>200.00</u>
TOTAL	..... P20,000.00

V. STRATEGY OF IMPLEMENTATION

The study is to be sub-contracted to a capable government agency or private organization who would be required to submit the names of people who would actually make the study, full time and part-time or consultancy including educational attainment and other qualifications and corresponding responsibilities. In all cases, however, the study shall be coordinated by a BRBC study coordinator.

In addition, bidders would be required to submit a program of work and basic outline of the feasibility study. They would still be subject to existing auditing rules and regulations.

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Should there be no bidder for the study, the study is to be conducted by an inter-agency task force who would be organized for this purpose.

A memorandum of agreement by and among government agencies to be involved in the study shall be made which shall define the terms and conditions of the study.

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TITLE  
SLAUGHTERHOUSE COMPLEX FEASIBILITY  
STUDIES

I RATIONALE

The Cocol region exhibits great potential for livestock development. There exists at present vast tracts of pasture and grazing land not yet commercially exploited and developed. These pasture lands could be utilized for the production of cattle and other large animals. Other groups of livestock that could be produced on a commercial basis include hog and poultry.

Marketing is a major constraint that impedes livestock development. This is due to a very significant cost in transporting the live animals to major market centers like the Metropolitan Manila Area. Carabao, cattle and hog outshipment from the four mainland provinces in the region constitutes about 24 per cent of the livestock inventory in 1974.

The cost of shipping live animals to Manila is excessively high. For instance, live cattle shipped to Manila costs about ₱180.00 per head. Of this amount, 72 per cent represented shrinkage. Carabao and hog shipping costs to Manila is about ₱100 and ₱64 per head, respectively. In both cases, significant portion of the shipping costs is attributable to higher shrinkage.

Significant savings will, therefore, accrue to the livestock producers if shipments will be in the form of carcass rather than live animals. The slaughterhouse is identified as the most essential facility to stimulate the growth of the livestock industry and of the basin area in particular.

## II OBJECTIVES

The pre-feasibility study conducted by the Special Studies Division of the Department of Agriculture established already the financial and economic viability of the project. Certain issues of importance to potential investors which were not covered in the pre-feasibility study need a more careful study. The proposed feasibility study will:

1. Identify various alternative sites for the plant and establish priority rankings based on economics of location.
2. Quantify demand for identified product outputs in the local and external market centers.

## III PROJECT DESCRIPTION

### A. Scope of Work

The feasibility report submitted by the SSD should be further reviewed to determine additional critical areas for investigation. This type of activity could be completed within a period of two weeks.

Specific memorandum of agreement will then be developed after a thorough review of the initial feasibility report. A three-week period is allocated for this activity.

Special attention should be given in the analytical framework for the design of the market study. This will include the preparation of the survey instruments and identification of the study area and survey respondents.

B. Schedule of Work

Review of feasibility report submitted by the SSD, DA	2 weeks
Development of memorandum of agreement	3 weeks
Market study	2 months

C. Output

1. Determination of exact location of the slaughterhouse complex in Naga City considering the NMIC regulations.
2. Quantification of slaughterhouse outputs (product and by-product) per day.
3. Present and projected demand of products and by-product.
4. Identification of market outlets in the Basin, the region, Greater Manila Area and other cities.
5. A marketing strategy of plant product and by-product.

IV REQUIREMENT

A. Manpower

1 Study Coordinator/Economist	<u>Duration</u> 3 months
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1 Market Analyst	3 months
1 Marketing Specialist	2 months
1 Livestock Specialist	2 months
2 Researchers	3 months
1 Clerk/Typist	3 months

**B. Budgetary**

Honorarium/Salaries	P7,000.00
Travel Expenses	5,000.00
Supplies & Materials	6,000.00
Contingencies	<u>2,000.00</u>
T O T A L	<u><u>P20,000.00</u></u>

**C. Duration**

The project will be completed in 3 months time.

**V IMPLEMENTATION STRATEGY**

The SSD-DA and other consulting firms who has the capability shall be requested to submit proposals with cost to the BRBC. Awarding of contracts shall be in accordance with the established policies of the government. In case that the study will not be contracted, a multi-agency group will be organized to do the job. This group should, however, be coordinated by a BRBC coordinator.

A memorandum of agreement by and among the agencies concerned shall be instituted to spell out terms and conditions of the study.

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PRE-FEASIBILITY STUDY ON THE ESTABLISHMENT  
OF WAX AND CANDLE FACTORY

**I. RATIONALE**

With the proposed establishment of a slaughterhouse complex in the area, livestock production in the region will be absorbed by the plant thereby decreasing the marketing cost. Livestock by-products which are presently non-utilized/under-utilized will be used profitably and economically.

The utilization of animal-by-products is essentially labor-intensive, does not need large-scale investment and does not require sophisticated equipment or expensive machinery for small scale processing. Processing maybe undertaken with a minimum of equipment and simple gadgets. These are, therefore, favorable prospects for introducing to the rural areas new opportunities for self-improvement and for economic employment.

One of the by-products of livestock slaughtering which is un-utilized is inedible fats. This is one of the raw materials utilized in the manufacture of wax and candle. Considering the volume of inedible fats from the slaughterhouse that will be wasted, a study should be conducted to utilize if not maximize the use of this by-product.

**II. OBJECTIVES**

- a. To test the economic and financial viability of

the establishment of a wax and candle factory in Bicol.

- b. To maximize the utilization of slaughter by-products

**III. DESCRIPTION**

**A. SCOPE OF WORK**

The study will determine the technical, economic and financial viability of the establishment of wax and candle factory considering the site of the proposed slaughterhouse complex which will supply the raw materials. It will quantify the volume of the raw materials needed and determine whether the slaughterhouse can supply the required volume. The study will determine the markets, factory size, area, site and the financing requirement.

**B. SCHEDULE OF WORK**

**DURATION**

- |  |          |
|--|----------|
| 1. Assessment of supply of raw materials                             | 1 month  |
| 2. Assessment of other materials like fish by-products as fats, etc. | .5 month |
| 3. Identification of technological process                           | .5 month |
| 4. Determination of plant size, capacity and financing requirement   | 2 months |
| 5. Determination of factory site                                     | .5 month |
| 6. Identification of market outlets                                  | 1 month  |

C. OUTPUTS:

1. Projected supply of raw materials and sources.
2. Optimum plant size, area and location.
3. Minimum, optimum and maximum capacity per day.
4. Minimum, optimum and maximum production per day.
5. Financial requirements, including annual operating costs and income.
6. Manpower and facility requirements.
7. Identified markets and marketing program.
8. Economic and financial analysis.

IV. REQUIREMENTS

<u>A. Manpower</u>	<u>Man-months</u>
1 Study Coordinator/Economist	3
1 Market Analyst	3
1 Livestock By-product Processing Specialist	3
1 Industrial Engineer	2
1 Civil Engineer	2
3 Direct Hire Researchers	3
1 Clerk-Typist (Direct hire)	3
1 Driver (Direct hire)	3
<u>B. Budgetary</u>	

The study will have a duration of 3 months with an approximate budget of P25,000.00. This

amount already includes materials and printing costs of the study.

V. IMPLEMENTATION STRATEGY

The study shall be contracted to a private contractor or a government agency like the BAI or NIST, who has the experience and capability to do the job. If no contractor is found, a multi-agency study team shall be organized. However, BRBC shall designate a **Study Coordinator** to coordinate the study

A memorandum of agreement **shall** be instituted by and among agencies concerned which shall define the terms and conditions of the study.

## STUDY FOR A TANNERY IN PASACAO

### I. RATIONALE

Several programs have been launched by the government to support the livestock industry and increase livestock production but marketing remains a problem of producers. One of the possible solutions to this problem is the establishment of a cold storage and slaughterhouse complex.

The establishment of a cold storage & slaughterhouse complex will reduce shrinkage, convoy, and injury losses and marketing cost which will be beneficial to the producers. Slaughterhouse by-products will be fully utilized. Results of research conducted by BAI have shown that the under-utilization of livestock by-products is mainly due to lack of information about their utility, knowhow and expertise in the processing of same.

One of the prospects identified by PCAR studies is the production of leather. In 1964, imports of hides and raw skins were valued at P 8 M.<sup>1/</sup> The production of more and better hides and skin will develop from expanded cattle production. Since the local tanning industry is comparable with the best in the world, further development of the industry will eventually cut down the out flow of import dollars for hides and skins. The tannery will also

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<sup>1/</sup> Beef and Carabeef National Program Research, PCAR, 1972  
UPLB, Laguna

increase the value added of the livestock industry to the Basin economy and at the same time increase employment opportunities.

In the Bicol Region, there is no existing tannery today. With the prospect of the establishment of a slaughterhouse complex in Bicol, a tannery becomes possible to utilize by-products of the slaughterhouse.

The Transport Planning Group of BRBC has initially identified Pasacao as a potential area for the establishment of a tannery, it being a port of entry to serve the bulk handling of material and agricultural products from Manila and other parts of the region. Pasacao is accessible, by water transport, to Masbate, the biggest cattle producing province in the region.

## II. OBJECTIVES

- a. To determine the economic and financial viability of the establishment of a tannery in Pasacao, Camarines Sur.
- b. To maximize the utilization of livestock by-products.
- c. To identify probable link industries

## III. DESCRIPTION

### A. Scope of Work

The proposed site of the project is Pasacao which is approximately 24 kilometers from Naga City. The study group will have to pinpoint the exact site and area of the project.

The study will determine the economic and financial viability of the project. It will also quantify the economic and social benefits and determine the ecological effects in the area.

The study should be able also to identify probable link industries such as shoes and bag factory and other by-product utilization especially with the establishment of the proposed slaughterhouse complex.

<b>B. <u>Schedule of Work</u></b>	<b><u>Duration</u></b>
1. Assessment of supply of raw materials	1 month
2. Assessment of other tanning material	1 month
3. Identification of the technological process	1 month
4. Determination of plant size and capacity and financing requirement	2 months
5. Identification of exact site of the project	5 months
6. Determination of probable link industries	2 months
7. Quantification of social benefits	1.5 mos.
8. Quantification of economic benefits	1.5 mos.
9. Determination of ecological benefits	1.5 mos.

C. Outputs

1. Projected supply of raw materials and sources
2. Optimum plant size, area, and location
3. Minimum, optimum and maximum capacity per day
4. Minimum, optimum and maximum production per day
5. Financial requirements, including annual operating costs and income
6. Manpower and facility requirements
7. Identified linkage industries
8. Identified markets and marketing program
9. Economic and financial analysis.

IV. REQUIREMENT

A. <u>Manpower</u>	<u>Man-months</u>
1 Study coordinator/Economist	6 months
1 Market Analyst	6 months
1 Ecologist	3 months
1 livestock By-product Processing Specialist	6 months
1 Sociologist	3 months
1 Industrial Engineer	3 months
1 Civil Engineer	3 months
1 Meat Inspector	3 months
3 Direct hire Researchers	5 months
1 Clerk-Typist (DH)	6 months

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1 Driver (DH)	6 months
<b>B. <u>Budgetary</u></b>	
Salaries/Honorarium	₱20,000.00
Travel Expenses	15,000.00
Supplies and Materials	10,000.00
Contingencies	<u>5,000.00</u>
T O T A L	₱50,000.00

V STRATEGY OF IMPLEMENTATION

The study shall be contracted to a private contractor or a government agency like BAI or NIST, who has the capability to do the job. If no contractor is found, a multi-agency study team shall be organized to do the task. In all cases, the study shall be coordinated by a BRBC Study Coordinator.

A memorandum of agreement shall be installed by and among agencies concerned which shall define the terms and conditions of the study.

## SALT PROCESSING FACILITY

### I. RATIONALE

At the present time, there is only one salt-producing plant in the Bicol region. It is a pilot project located at Tiwi using geothermal power to produce salt from salt water. The success of this project has pointed out the technical feasibility of developing a salt plant and/or an additional iodizing plant on a much larger scale. It must now be determined whether there is sufficient demand for salt to warrant the investment in a salt plant.

The alternatives to setting up a salt plant is to continue to import salt into the region which would continue to draw funds out of the region. Considering that a fish processing facility and a meat packing plant are both being planned for the region, it does not make sense to ship in the large quantities of salt these facilities require. The salt can be produced in large quantities at a reasonable cost in the region utilizing resources already available, therefore, the possibility of installing a salt processing facility should be thoroughly investigated. The establishment of the facility also generates additional value added to the economy and increase employment opportunities

## II. OBJECTIVES

1. Utilize a readily available resource in the region,
2. Provide an adequate supply of an important raw material for food processing.
3. Supply consumers with a quality product at a low cost.

## III. PROJECT DESCRIPTION

### A. Scope of Work

#### Engineering:

1. Determine the equipment requirements based on the process used at Tiwi.
2. Determine optimum location based on resources required.
3. Design plant to meet the needs of the area and outside the region including layout and production flows.
4. Compute total cost of the plant production costs and unit cost of production.

#### Economics:

1. Estimate total market both within Bicol and in the Philippines. Separate estimates between consumer and industrial demand.

2. Determine present salt production in the Philippines.
3. Estimate market price based on past trends, taking into account the present situation and future trends.
4. Determine optimum plant size.
5. Estimate total number of employment opportunities generated.
6. Compute the Balance Sheet, Income and Cash Flow Statement five (5) years ahead using a high-low and a medium assumption.
7. Develop a complete financial analysis, including break even analysis, benefit cost and IRR.

<u>B. Schedule of Work</u>	<u>Duration</u>
1. Market study	1 month
2. Location analysis	2 weeks
3. Design plant	1 month
4. Compute production costs, including unit costs.	2 weeks
5. Compute total project cost	1 week
6. Determine size of the work force	1 week
7. Compute Balance Sheet, Income Statements and Cash Flow	1 week

8. Prepare a complete financial analysis 1 week

Estimated total project time is three (3) months.

C. OUTPUT

1. Optimum plant size, location, and area
2. Projected minimum, optimum and maximum production per day.
3. Identified markets and marketing program
4. Financial requirements and annual operating cost and income.
5. Plant equipment and facility requirements.
6. Manpower and training requirements
7. Economic and financial analysis.

IV. REQUIREMENTS

A. Manpower

- 1 Study Coordinator/Economist
- 1 Market Analyst
- 1 Industrial Engineer
- 1 Civil Engineer
- 1 Financial Analyst
- 2 Researchers
- 1 Clerk Typist

B. Budgetary Estimates

The Study should be completed at a total cost of \$35,000.00.

V. IMPLEMENTATION STRATEGY

The study shall be contracted to a contractor, private or a government agency, who has the capability to do the study. If no contractor is found, a multi-agency study team shall be organized. In all cases, however, the study will be coordinated by a BRBC study coordinator

A memorandum of agreement shall be instituted by and among government agencies that will be involved in the project which shall define the terms and conditions of the study.

## CASSAVA FLOUR MILL PRE-FEASIBILITY STUDY

### I. RATIONALE

The most important use of cassava in the Philippines so far is as source of industrial starch. One of the main products of cassava is flour. Studies have shown that cassava flour could serve as extender for "pan de sal" as well as other baked products, noodles and other snack/dessert preparations made from rice and/or corn. The country imported in 1974 \$10 million worth of wheat and other flour products. The potential therefore of cassava flour as a dollar saving industry is tremendous.

The establishment of the cassava flour mill is consistent with the targets of the agribusiness sector and complementary to the targets of the agriculture sector. It will spur cassava farmers to be efficient in their production and absorb the projected surplus production in the area, thereby maintaining reasonable price levels and generate employment opportunities. Eventually, other cassava-based industries may grow.

The National Institute of Science and Technology and leading state universities have conducted several studies on cassava flour and other utilization of cassava.

### II. OBJECTIVES

1. To determine the technical, economic and financial

viability of a cassava flour mill.

2. To identify other viable cassava-based industries.

### III. PROJECT DESCRIPTION

#### Scope of Work

The study should be able to determine the technical, economic and financial soundness of a cassava flour mill in the Basin. The design of the mill must consider alternative sources of raw materials like sweet potato or arrow root. The by-products of milling must be identified and their utilization pinpointed including the technology necessary. Studies on raw materials, markets, plant design and location, manpower and financial requirements, as well as the usual financial and economic analysis should also be made.

The study hopes to serve also the Bicol Region as a whole.

#### 2. Schedule of Work

#### Duration

- a. Survey and evaluation of existing and potential areas for commercial cassava production, processing technology, and government cassava program.

1 month

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- b. Market demand and market supply study 2 months
- c. Designing of the plant 1 month
- d. Finalization of the study 2 weeks
- e. Reproduction and submission 2 weeks

### 3. Output

- a. Projected supply and demand potential in the Basin, the region and Metro Manila.
- b. Minimum, optimum and maximum capacity per day.
- c. Expected minimum, optimum and maximum output per day including by-products.
- d. Input requirements
- e. Optimum plant design and location, including alternatives to use the mill for other root crops, like sweet potato.
- f. Manpower requirement and training component.
- g. Investment requirement including foreign exchange component.
- h. Annual operating costs and income.
- i. Pricing and marketing policy and program
- j. Institutional mechanisms to support intensified production activities such as research, extension, credit, production inputs and organization of growers' association.

## IV. REQUIREMENTS

A. Manpower

	<u>Man-months</u>	<u>Agency</u>
1 Study Coordinator	3	BRBC
1 Financial Analyst	2	BRBC
1 Food Technologist	2	UPLB
1 Civil Engineer	1	NIST
1 Industrial Engineer	2	NIST
1 Cassava Specialist	1	UPLB
1 Market Analyst	3	BRBC
2 Researchers	2	BAECON

B. Budgetary

Salaries and Honorarium	P14,500.00
Supplies	5,000.00
Travel Expenses/diems	16,000.00
	<hr/>
	P35,500.00

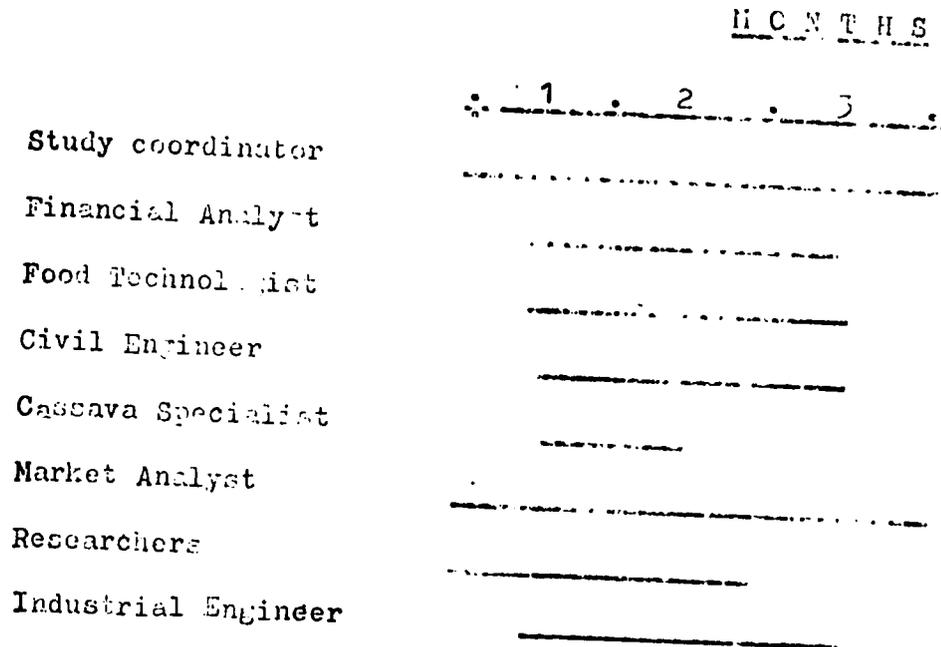
## V. IMPLEMENTATION

The study should be contracted to the NIST or to a private contractor who possess the qualifications. If no contractor is found, a multi-agency study team shall be organized to do the job as outlined in Section IV A of the proposal. In all cases, the BRBC Agribusiness staff shall coordinate its implementation.

A memorandum of agreement by & among the participating agencies will be developed which will specify the terms and conditions for the conduct of the study.

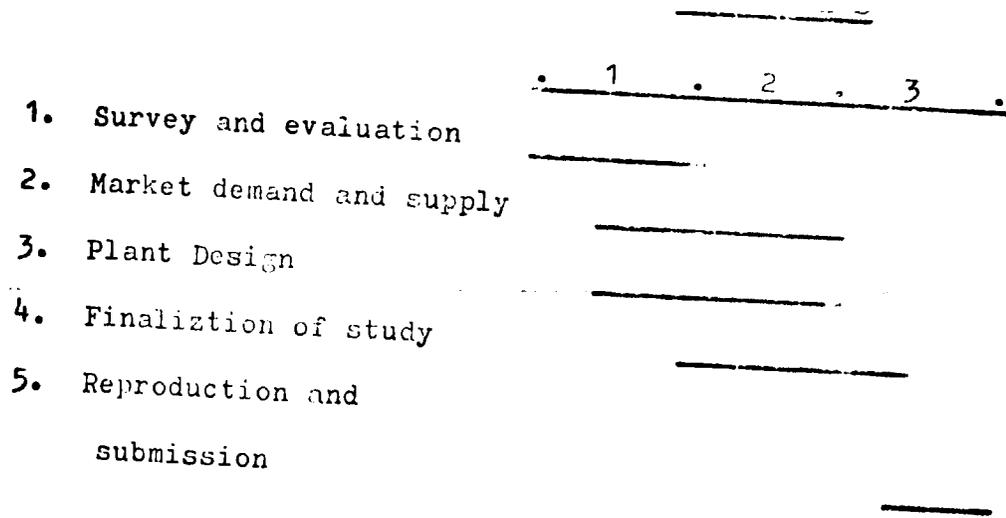
APPENDIX A

GIANTT Chart Showing Personnel Work Schedule



APPENDIX B

Gantt Chart for Schedule of Work



## PRE-FEASIBILITY FOR SUGAR BY-PRODUCTS INDUSTRY

### I. RATIONALE

Sugar cane has generated a lot of agro-based industries in the Philippines. The two important by-products of sugar cane which have found a lot of industrial uses are molasses and bagasse. Molasses is used as livestock feed and in the manufacture of alcohol, rum and yeast. Bagasse, on the other hand, is used as fuel and organic fertilizer and in the manufacture of fiber board, paper, cellulose, explosives and artificial silk.

The Bicolandia Sugar Development Corporation, which is located in the Basin, is the only sugar mill in the region. The Central is now in its second milling season. It needs 15,000 hectares to operate at an optimum capacity. This capacity coupled with high yielding varieties and modern production practices will increase sugar yield as well as its by-products. The increase in by-products necessitates its utilization thus increasing planters profit.

The molasses and bagasse produced by the central during the first two seasons contributed to the marketing and disposal problem. The non-utilization of bagasse created a solid waste disposal problem, while molasses had problems on marketing.

The utilization of these major by-products, therefore, will not only encourage more people to go into sugar cane production but also promote efficiency in by-product utilization. Moreover, additional industries will be developed which will generate additional value added for the Basin economy and create more employment opportunities.

The identification and establishment of a viable integrated sugar by-product based industries is consistent with the targets of the agribusiness sector and complimentary to the goals of the agriculture sector. The study will benefit the probable investors and the financial institutions who are looking for business opportunities in the Basin.

The Philippine Sugar Commission (PHILSUCOM) together with other agencies and State Universities have and are still conducting extensive studies and research on the industrial utilization of the sugar by-products. The feasibility of integration of the sugar industry in the Basin necessarily will bring more economic opportunities.

## II. OBJECTIVES

1. To determine the technical and economic viability and financial requirement of sugar cane by-product utilization of the BISUDECO.

2. To identify the priorities for development of each by-products.

### III. PROJECT DESCRIPTION

#### 1. Scope of Work

The pre-feasibility study should identify all possible industrial products that could be processed from the by-products of the BISUDECO Central. It should work on the integration of all by-products of sugar. The study must be able to identify the advantages and disadvantages of complete integration. It must identify the priority industries that must be developed, including the criteria used in ranking and the schedule of establishment of each by-product industry. Appropriate studies like technological processes, markets, manpower, equipment and financial requirements should be done. Aside from BISUDECO Central, attention may also be focused on the utilization of by-products from panocha-makers in the Basin. An economic and financial analysis must be done.

#### 2. Schedule of Work

(a) Survey and evaluation of:

Time

3 months

1. Current and future production targets of BISUDECO

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2. Processing technology of by-products at PHILSUGIN, NIST
3. Existing sugar mills and their by-product utilization
4. Leading industries which utilized sugar by-products
5. By-products to be processed in the basin

(b) Market demand and supply study	3 months
(c) Designing of processing plants	2 months
(d) Finalization of the study	15 months
(e) Reproduction and submission	2 weeks

<sup>1</sup>Total time scheduled to finish the study is 6 months.

3. Output for each sugar by-product industry

- (a) Projected supply and demand potentials
- (b) Minimum, optimum and maximum capacity per day
- (c) Expected minimum, optimum and maximum production per day
- (d) Priority listing of sugar by-product processing plants, including time phasing to achieve the integration of the sugar industry in the Basin.

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- (e) Optimum plant design, location including alternatives and quantification of raw material requirements.
- (f) Manpower and training requirements
- (g) Equipment and facility specifications
- (h) Investment requirements, annual operating costs and income, including foreign exchange components.
- (i) Pricing and Marketing policy and program
- (j) Institutional mechanisms that will support intensified production activities and the development of these by-products industry.
- (k) Economic and financial analysis

IV REQUIREMENTS

<u>1. Manpower</u>	<u>Man-Months</u>	<u>Agency</u>
1 Study Coordinator/ Economist	6	BRBC
1 Study Director	6	PHILSUGIN
1 Chemical Engineer	4	PHILSUGIN
1 Industrial Engineer	3	NIST
1 Factory Manager	1	BISUDECO
1 Civil Engineer	3	BRBC
1 Finance Analyst	3	BRBC
1 Market Analyst	4	BRBC

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1 Sugarcane Specialist	1	UPLB
4 Researchers	5	Direct Hire
1 Clerk Typist	6	Direct Hire
2. <u>Budgetary</u>		
Salaries		₱12,500.00
Honorarium		12,000.00
Supplies/Materials		20,000.00
Travel Expenses/Dicms		15,000.00
Equipment		15,000.00
Contingencies		<u>10,000.00</u>
TOTAL .....		₱84,500.00

V. IMPLEMENTATION

The study could be contracted to a private contractor who has the expertise on the subject or through a government agency. It is recommended that the study be contracted to either the Philippine Sugar Institute or to the NIST. If nobody is contracted, then a multi-agency study team shall be organized to do the task as outlined in Section IV 1. In all cases, however, the study should be coordinated by a BRBC Study Coordinator.

VI. MEMORANDUM OF AGREEMENT

A memorandum of agreement by and among the participating agencies will be developed, if the study is not contracted. The agreement shall specify the terms and conditions for the conduct of the study.

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**CITRUS JUICE EXTRACTION**  
**PRE-FEASIBILITY STUDY**

**I. RATIONALE**

Government economic planners have put emphasis on increase food production to meet food requirements, conserve foreign exchange, reduce if not stop, importation, and generate additional employment. The Basin planners have adopted the same complimentary approach.

Central Bank reports that the country imported a yearly average of 138 thousand liters of citrus juice between 1960-1970. This represented a yearly dollar drain of \$110,000. To solve this problem, the government has embarked on a program to increase fresh citrus fruit production. Citrus production in the Basin is projected to produce a surplus starting 1980. Out-basin markets must be developed to maintain reasonable prices for the benefit of producers and consumers.

The Agribusiness sector, consistent with its objective of generating additional value added for the economy and additional employment for the basin area has identified citrus juice processing as a priority linkage industry which must be developed. Hopefully, the start of a citrus juice extraction processing plant in the area will spin-off additional citrus-based industries like marmalades, preserve rind and a few others.

The National Institute of Science and Technology has conducted several studies on citrus juice extraction and other by products. Other Philippine Universities have also done several studies on the same vein. The only reason why they have not found commercial application is because the country has not produced enough surplus.

## II. OBJECTIVES

1. To determine the technical, economic and financial viability of a citrus juice extraction processing plant.
2. To identify other viable citrus based industries.

## III. PROJECT DESCRIPTION

### 1. Scope of Work

The Study should be able to determine the technical, economic and financial soundness of a citrus juice extraction plant. As far as feasible, the technological process involved in citrus juice extraction could also be used in the juice extraction of other fresh fruits. The extraction by-products should be identified and their further utilization pinpointed including the necessary processing technology. Studies on raw materials, markets, plant design and location, manpower and financial requirements, as well as the usual economic and financial analysis should be done.

The study will hopefully cover not only the Basin provinces, but also the other Bicol provinces as sources of raw materials and as potential markets.

- | 2. | <u>Schedule of Work</u>  | <u>Duration</u> |
|----|--|-----------------|
| a. | Survey and evaluation of:<br>available processing technology,<br>existing citrus orchards, govern-<br>ment citrus program, production,<br>the citrus growers associations. | 1 month         |
| b. | Market demand and market supply<br>study   | 2 months        |
| c. | Designing of the plant, quanti-<br>fication of investment require-<br>ments.   | 1 month         |
| d. | Finalization of the study  | 2 weeks         |
| e. | Reproduction and submission  | 2 weeks         |
| 3. | <u>Output</u>  |                 |
| a. | Existing and projected supply and demand<br>potentials in the Basin, the Region and<br>Metro Manila.   |                 |
| b. | Minimum, optimum and maximum capacity per day.   |                 |
| c. | Expected minimum, optimum and maximum output<br>per day including by-products.   |                 |

- d. Identified citrus juice extraction by-product industries
- e. Input requirements
- f. Optimum plant design and location including alternatives
- g. Pricing and marketing policy and program
- h. Investment requirements
- i. Personnel and its training requirements
- j. Annual operating costs and income and foreign currency components
- k. Institutional mechanisms that will support increased production activities such as research, extension, credit, production inputs, and strengthening of growers association.

IV. REQUIREMENTS

A.	<u>Manpower</u>	<u>Man Months</u>	<u>Agency</u>
	1 Study Coordinator	3 months	BRBC
	1 Financial Analyst	1 month	BRBC
	1 Food Technologist	2 months	NIST
	1 Civil Engineer	1 month	NIST
	1 Industrial Engineer	2 months	NIST
	1 Citriculture Specialist	1 month	BPI
	1 Market Analyst	3 months	BRBC
	6 Researchers	1 month	BAECON

B. Budgetary

Salaries and Honorarium	\$ 4,000.00
Supplies	5,000.00
Travel Expenses/diems	6,000.00
	<hr/>
	\$15,000.00

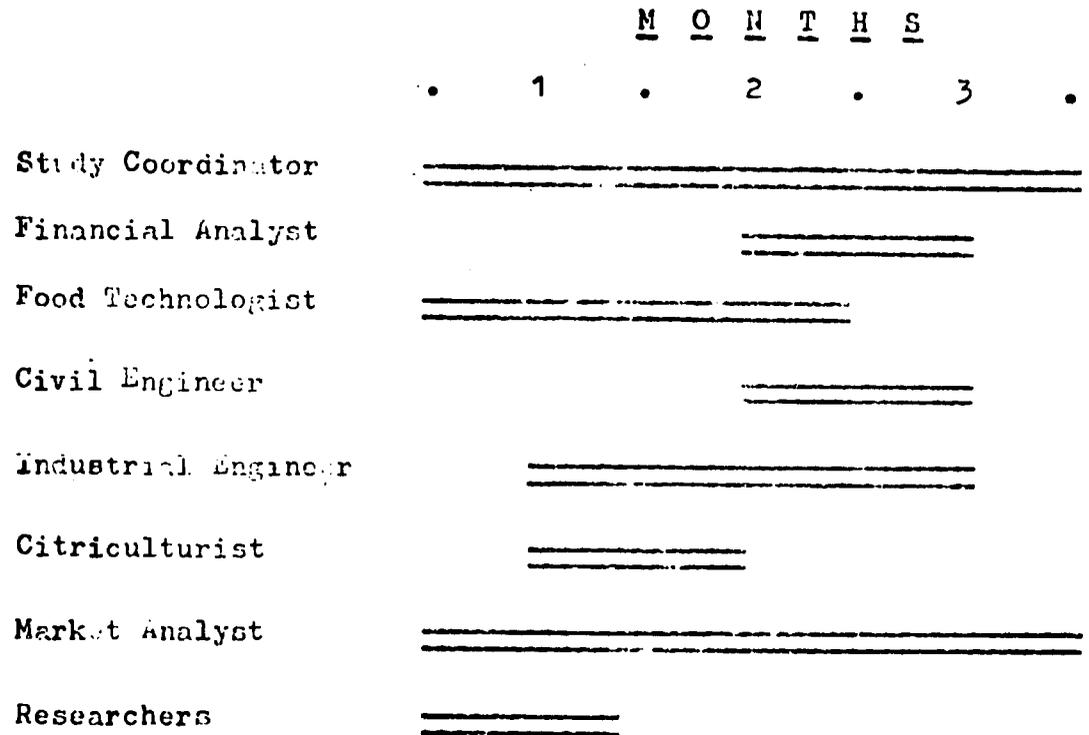
IMPLEMENTATION

The Study should be contracted to a private contractor who has the capability or a government agency like NIST. If no contractor is found, a multi-agency study team shall be organized to do the job as outlined in Section IV A of the proposal. In all cases, however, the study shall be coordinated by the BRBC Agribusiness Staff.

A Memorandum of Agreement by and among the participating agencies will be developed which will specify the terms and condition for the conduct of the study.

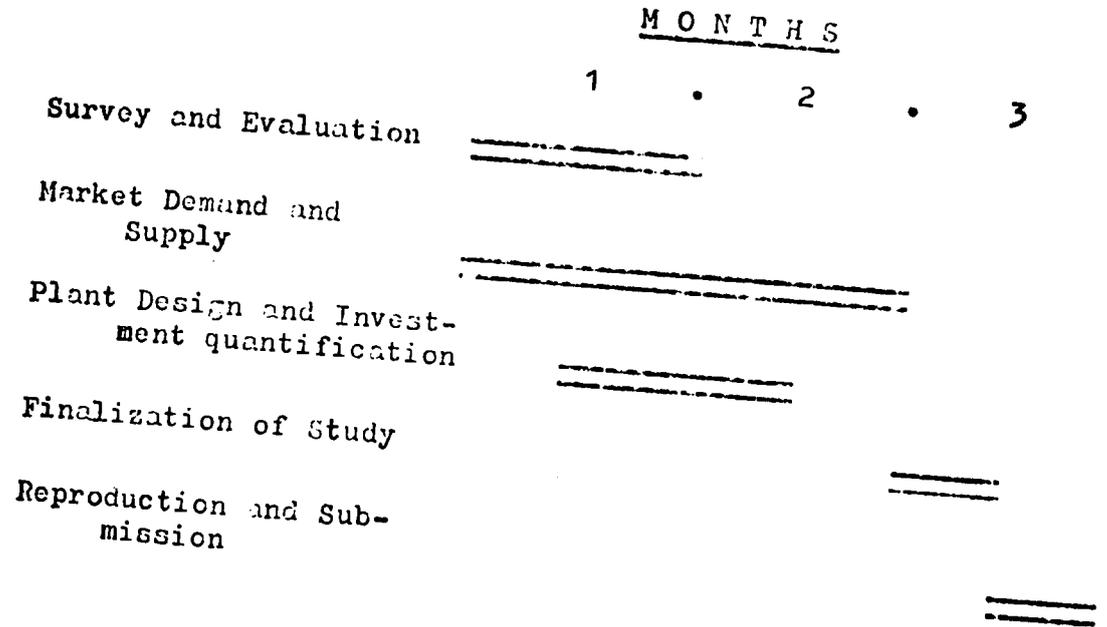
Citrus

APPENDIX A - Gantt chart showing personnel work  
schedule



C i t r u s

APPENDIX B - Gantt chart for schedule of work



Proposed Terms of Reference  
For a Feasibility Study of an  
Agricultural Lime Plant

**I RATIONALE**

Agricultural lime is constantly needed throughout the Bicol Region and throughout the Philippines in order to prepare the soil for crops. The projected increase in agricultural activity in the Basin area alone is expected to deplete soil fertility. To sustain agricultural productivity soil fertility must be maintained. Lime is one input in soil fertility management.

Since agricultural lime is easy to manufacture if there is good pure limestone present, it is advisable to investigate if it is economically feasible to produce this commodity locally in the region.

Listed below are additional benefits which will accrue to the area if an agricultural lime plant is constructed.

1. Increased local employment at the lime manufacturing site.
2. More economical source of lime to farmers.
3. A benefit to the region because it is one more product which can be made locally and pesos earned in the Bicol are not exported to another region.

**II OBJECTIVE**

To determine the economic, financial and market via-

bility of the project.

### III DESCRIPTION

#### A. Scope of Work

##### a) Engineering

Investigate possible sites for an agricultural lime processing center and consider the items listed below but do not limit investigations to these items if other pertinent items are to be relevant.

1. Transportation of raw materials to the plant.
2. Processing raw materials at the source as much as possible.
3. Drilling and mining equipment.
4. Excavating, hauling and lifting equipment.
5. Crushing and grinding equipment.
6. Transporting materials by trucks, sea or rail.
7. Loading and unloading in the most economical manner.
8. Determine the most suitable location for the lime plant based on present and future supplies of limestone, and the costs of transportation.

9. Locate additional roads if needed.
10. Make a preliminary site design for the plant.
11. Design the lime plant.
12. Make a flow diagram for materials processing and estimate daily, weekly, monthly and annual volumes.
13. Estimate long range production possibilities.
14. Estimate traffic generated or volume shipped.
15. Estimate costs of all facilities and present reasonable alternative designs which should be subjected to economic analysis.
16. Make preliminary designs or specifications and cost estimates of the following types of equipment needed at the agricultural lime processing center and/or mining area. Make preliminary designs or specifications and cost estimates of other equipment which is found to be needed.
  - a. Drilling and mining equipment.
  - b. Blasting equipment and dynamite.
  - c. Excavating, lifting and hauling equipment (power shovels, cranes, drag lines, front end loaders, mini railroads, con-

V K-3 A

veyors, etc.)

- d. Crushing and grinding equipment.
- e. Transporting materials by truck or mini rail.
- f. Loading and unloading in the most economical manner.
- g. Storage, vibrating screens and conveyors.
- h. Ball mill
- i. Second set of vibrating screens and conveyors.
- j. Bin storage.
- k. Shipping and bagging department.
- l. The alternative of manufacturing construction lime at some later date should also be evaluated. A rotary kiln and heating supplies are needed in addition to more storage bins conveyors, crushing equipment, a ball mill and an additional packing and shipping area.
- m. Office and laboratory.

b) Economic

1. Estimate regional agricultural lime needs for the next 5, 10, 15 and 25 years.
2. Estimate the Philippines projected agricultural lime capacity and shipping costs and

determine the competitive advantages of a local manufacturing plant.

3. Estimate potential savings as a result of the new lime plant.
4. Estimate increased employment directly attributable to the lime plant.
5. Estimate regional benefits from the lime plant.
6. Benefits received should be grouped in regards to whether the recipients are low income, middle income or high income groups.
7. Compute Benefit-Cost Ratios and IRR on alternatives considered.
8. Study the economic and financial performance of existing agricultural lime plants in the country.

e) Socio-Economic

1. Estimate area required for agricultural lime plant site to ensure local residents are not disturbed by noise, dusts, fumes, vibration and traffic.
2. Estimate measures needed to ensure separation of limestone rock mining and processing from local residents.

3. Estimate benefits from added employment.
4. Estimate the changes in consumption and expenditure patterns as a result of the added income to employees.
5. Estimate the impact on the residents (both positive and negative) of the new lime mining and processing center.

<b>B. <u>Schedule of Work</u></b>	<u>Duration</u>
1. Preliminary survey of agricultural lime use in the region.	2 weeks
2. Preliminary survey of agricultural limestone availability in the region.	3 weeks
3. Preliminary site selection for the limestone mining and the processing center.	
4. Preliminary design of limestone mining pattern and the limestone processing center.	2 weeks
5. Plan an acquisition program for raw materials sources.	2 weeks
6. Evaluate transportation alternatives for raw materials and for the final product	3 weeks
7. Evaluate loading, unloading and handling techniques to be used in raw materials processing.	3 weeks

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8. Design and evaluate additional roads needed and estimate costs. 3 weeks
9. Estimate short and long range Agricultural and construction lime plant production alternatives. 4 weeks
10. Estimate traffic that will be generated at all proposed sites. 2 weeks
11. Estimate costs of all facilities and costs of acquiring property needed. 2 weeks
12. Make cost estimate of all equipment needed at the proposed site or sites 2 weeks
13. Make an equipment schedule including guaranteed delivery dates of all equipment. 3 weeks
14. Estimate storage facilities needed for raw materials and for the final product. 2 weeks
15. Estimate building construction schedule including office and laboratory. 2 weeks
16. Develop a reasonable shipping schedule and identify volumes needed by province if possible. 2 weeks
17. Estimate regional agricultural and construction lime needs for short and long range time periods. 3 weeks

18. Estimate Philippine projected lime production capacity and determine if it is feasible to export it to other region in short or long range time periods. 3 weeks
19. Estimate value of lime that will be produced in the next 25 years. 2 weeks
20. Estimate savings to the region as a result of the lime facilities. 1 week
21. Estimate increased employment. 1 week
22. Estimate total benefits to the region. 1 week
23. Group benefits to show whether recipients are members of low, middle of high income groups. 2 weeks
24. Design all facilities to ensure that present or future residents are not disturbed by noise, fumes, dust vibration and traffic. 2 weeks
25. Estimate date when facility or facilities will be in operation. 2 weeks

C. Output of the Feasibility Study

1. An agricultural lime mining and processing package which will serve the Bicol Region and/or Camarines Sur economically in the short and long range.
2. Potential savings for the region derived from the

- construction of a lime processing center.
3. Additional employment and income generated.
  4. Financial requirements, annual operating cost and schedule of income.
  5. Identified markets and marketing program.
  6. Estimated prices of product.
  7. Economic and financial analysis.
  8. Preliminary plans for a construction lime plant, if feasible, to be added at some late date.
  9. Identified location for the limestone mine and related facilities, providing for future expansion and the construction in such a manner that new materials handling will be minimized and transportation and shipping costs will be minimized.
  10. A proposed land use for the affected area for 1980, 1985 and year 2000.
  11. Recommended plans for the region indicating which sites are most desirable now and in the future.

IV	MANPOWER REQUIREMENTS	<u>Manmonths</u>	<u>Agency</u>
	1 Study Coordinator	3	BRBC
	1 Civil Engineer	3	DPH
	1 Economist	2	BRBC
	1 Structural Engineer	1	DPH
	1 Draftsman	3	BREC

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1 Land Evaluator:	1	DPH
2 C. E. Aides	3	BRBC
1 Clerk/Typist	3	Direct Hire
1 Soils Engineer	1	DPH
3 Researchers	3	Direct Hire
2 Drivers	3	Direct Hire
1 Materials Handling Specialist	1	DPWTC
1 Geologist	1	Bureau of Mines
1 Urban Planner	1	DPWTC
1 Mechanical Engineer	2	NIST
1 Transportation Planner	1	DPWTC

BUDGETARY ESTIMATE

Salaries/Honorarium	P21,100.00
Traveling Expenses	15,000.00
Miscellaneous office Equipment	5,000.00
Contingencies	<u>8,900.00</u>
T O T A L	<u><u>P50,000.00</u></u>

V IMPLEMENTATION STRATEGY

The study should be contracted to a private contractor who possesses the capability to do the job. If no contractor is found, a multi-agency study team shall be organized to do the task. In all cases, a BRBC study coordinator shall coordinate the implementation.

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A memorandum of agreement shall be instituted by and among concerned agencies which shall define the terms and conditions of the study.

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## BAGASSE PULP AND PAPER MILL

### I. Rationale

A by-product in the production of sugar from cane plants bagasse has the potential of being utilized in the production of board, doors, ceiling and other acoustic materials.

With such value, most sugar centrals reserve the right to sell bagasse to interested industry and, gives cane planters only one third of the value of the sales.

In Camarines Sur where a sugar central has been established and is now in operation, bagasse is currently being burnt as fuel. Such activity may not seem a waste of raw materials since the central has not yet achieved the desired hectarage. However, by 1978, when the total cane area planted to sugar cane is estimated to reach 12,000 hectares, an alternative use of bagasse other than fuel has to be considered and linked with the industry.

However, because of the distance of the Bicol Sugar Development Corporation (BISUDECO) to existing pulp and paper mill using bagasse, demand of this material may be nil due to high transportation costs.

In this connection, establishment of a bagasse pulp and paper mill has to be considered in order to make use of available raw materials and at the same time provide additional income to cane planters.

Moreover, other than its complimentary value, a pulp and paper mill could increase employment opportunities to the basin population where unemployment rate is 7.11%<sup>1/</sup> higher than the national level. It could also promote development of allied industry linked to pulp and paper thus increasing the value of Gross Regional Product (GRP).

## II. Objectives

### A. General

1. To determine economic viability of a bagasse pulp and paper mill.
2. To determine availability of raw materials.
3. To determine possible influence of the industry to other sectors of development.

### B. Specific

1. To determine economic benefits of the project.
2. To identify industry linkages that would affect employment and income.
3. To assess market potential for the product.
4. To determine plant site, size and raw materials requirement.
5. To determine cost of machinery and other operational cost.
6. To identify other facility need of the project.

<sup>1/</sup>SSRU, unemployment and underemployment rate in the Bicol River Basin Area, 1973.

**III. Project Description**

The study will determine the technical and economic viability of the project. It should include however social effects and financing requirements. Other items that should be included are:

1. Estimate of market demand
2. Effect on health of factory workers
3. Cost and quality of product

In addition study should include effect on the economy of the province.

Output of the study will be in the form of:

1. Determination of the technological process involved.
2. Determination of the economic viability using benefit cost ratio and internal rates of return.
3. Quantifications of social and economic benefits to the area.
4. Determination of the machinery and size including financing requirements.
5. Identification of other facilities and necessary cost for the operation of the mill.

**IV. Scope of Work**

Schedule of activity corresponding output is reflected below:

<u>ACTIVITY/SCHEDULE</u>	<u>OUTPUT</u>
A. Engineering	
1. Machinery Evaluation (2 weeks)	- Assessment of needed machinery, size, capacity, volume of output, quality, operational cost, basic machinery cost and installment cost, power services and other needed facilities in the operation of mill.
2. Technological Evaluation (2 weeks)	- Assessment of the technological process present and future with emphasis on production process, fuel economy and alternative sources of fuel.
B. Economics	
1. Supply study (2 weeks)	- Determination of the present and future volume of raw material products needed in the production process.

2. Demand study  
(2 weeks)
  - Examination of present and future demand of raw materials.
3. Market study  
(1 month)
  - Determination of the present and future market utilization of the product and possible behavior including price behavior.
4. Product study  
(1 month)
  - Identification of the uses of the product including possible future uses.
- C. Socio-economic  
(1 month)
  - Effect of the project on employment, Income level, promotion of allied industry and other social benefits.

The Engineering study will be translated in terms of machinery identification, size, determination, cost quantification of equipment and other facilities and operational cost.

The Economic study should quantify value added to the GRP including an analysis of the economic viability using benefit cost ratio and IRR method.

V. Schedule of Work

The entire study including report writing is estimated

to be completed in 3 months time.

VI. Budgetary Estimate

The amount of P50,000.00 is estimated to cover the entire phases of the study.

COCONUT COIR PROCESSING AND WALL BOARD  
MANUFACTURING PLANT

**I. Introduction**

When looking for new industries to introduce in the basin area one must consider the resources available for use. One such resource which is not now used but has many potentials is coconut. One of its important potentials is the manufacture of coconut coir. This product has many uses such as bristles for brushes and when spun into twine it can be used for doormats. Coir dusts and short fibers can be made into wall board thus allowing a second product to be produced from the proposed plant. It now must be determined whether it is economically feasible to build and operate soon a plant or an integrated plant in the basin area.

**II. Rationale**

The problem to be solved herein is to find a way to utilize a resource not now used thereby provided income and employment opportunities for the region. One way to do this is through the development of a coir processing plant. The problem, however, is that coir fibers have competitive products such as synthetic fibers. The major advantage that coir has over these fibers is that coir is not made out of oil. The increase in oil prices within the last several years has made products like coir competitive now that synthetic fibers have increased in cost. The development of

replacements for these synthetic fibers will aid in helping the Philippines lessen its dependence on foreign oil thus aiding in cutting the balance of trade difference which is in line with national priorities. The wall board that the plant produces will face the competition from wood products. Coconut wall board definitely has the advantage in that wood products are becoming more and more expensive as forest area declines. By merely replacing wood products the wall board will help save the declining forest areas of the Philippines and provide an excellent material to meet the increased housing demands for the future.

The beneficiaries of this program will be many and varied. The processors will benefit through the income received from running the plant. The workers in the plant will benefit through the increased income they will undoubtedly receive. Small scale industry will benefit by having available to it a raw material which can be used to make many products. Farmers will also benefit by receiving the income from coconut shells which they now discard. Home builders will benefit by having a supply of coco-priced wall board available for home construction.

### III. Objective

To determine the economic, financial and technical viability of the project.

IV. Scope of work

Engineering

1. Identify manufacturing process best suited for used in the region for both coir process and wall board which can be used to make many products. Farmers will also benefit by receiving the income for coconut shells which they now discard.
2. Determine equipment requirements also locate possible sources and obtain cost estimates.
3. Compute total cost of operation and unit cost of production.
4. Determine number of workers needed and skills required.
5. a) Design plant layout and building requirements also work out flow diagram for production process.  
b) Determine raw material needs and cost.
6. a) Estimate the size of the market and areas of distribution.  
b) Compute selling price based on the market demand price of both the coir and the wall board.  
c) Determine optimal plant location taking all factors into account.  
d) Determine optimal plant size.
7. Estimate total number of employment opportunities generated taking into account both primary and secondary

8. Compute total project cost including construction of plant and working capital needs.

9. Project Balance Sheet, Income Statement and Cash Flow Statement a head for 5 years using a high, medium and a low estimate.

10. Do a complete financial analysis including break even analysis IRR and all other key financial ratios.

V. Schedule of Work

1. Market Study	2 months
2. Location Analysis	1 month
3. Identify production method and design plant	1½ months
4. Locate sources of supply for equipment and costs	2 weeks
5. Compute total production costs and unit costs	1 week
6. Determine number of workers needed and skills required	1 week
7. Compute raw material needs and costs	1 week
8. Compute Balance Sheet, Income Statement and Cash Flow State- ment	2 weeks
9. Do a complete financial analysis	1 week

Estimated total time 3 months to complete the study.

VI. Manpower Requirements

1. Market Analyst (1) - Handles all elements concerning the market study.
2. Industrial Engineer (1) - Determines best production process locate machinery and design plant and production process.
3. Economist (1) - Deals with optimal plant location and size also assess the impact of the plant on the region.
4. Financial Analyst (1) - Develops total project cost and financial statements.
5. Agronomist (1) - Locates sources and estimates supply available of raw material.
6. Researchers (3)
7. Clerk/Typist (2)

VII. Budgetary Requirements

Salaries

Market Analyst	P3,600.00
Industrial Engineer	3,600.00
Economist	3,600.00
Financial Analyst	3,600.00
Agronomist	3,600.00
Researchers (3)	5,400.00
Clerk/Typist (2)	3,600.00

Total Salaries	P26,400.00
Travel and per diems	5,000.00
Supplies and Contingencies	<u>3,600.00</u>
Total Cost	P35,000.00 =====

VIII. Implementation

Alternatives available

1. Contract to local consulting firm or another government agency.
2. Develop staff within the BRBC.

IX. Selection

The best alternative would be to contract the study out due to the fact that the BRBC does not now have the staff to handle the study and acquisition of staff for such a short term project is difficult. Therefore, a contractor could handle the study at a lower cost which makes the contractor the best alternative.

PROPOSAL FOR AN INTEGRATED  
FISH PROCESSING PLANT

I. Rationale

Substantial quantity of cheap species such as sharks, pike eel, croakers, bonitos, etc. are caught in the marine waters of the Bicol Region. These species comprise almost 60% of the total fish caught and about 14,000/M.T. of the 24,000/M.T. of fish landed by commercial fishing vessels in 1974. Moreover, 20% of the total fish landed are wasted due to spoilage which can roughly feed 110,000 people more.

Market demand for the above species in itself, are comparatively lower than those processed to other fishery products. Based on the study in the pilot fish processing plant of the Bureau of Fisheries and Aquatic Resources (BFAR) in Mercedes, Camarines Norte, fish sausage has market acceptability.

In fish sausage manufacturing, only about forty five percent (45%) of the fish is being utilized. The remaining parts which are normally treated as waste can be used by integrating other projects that will maximize fish usage, like a fish meal plant, an oil extraction plant for a potential integrated fish manufacturing plant. This proposal intends to investigate the mechanism that will fully develop an integrated processing plant to maximize utilization of fish and its by-products.

The integrated processing approach will enhance the inter-relation of three operations. Waste from fish sausage manufacturing is used for fish meal production and fish oil extraction. The findings of food scientists from Zorry Research Laboratory of the United Kingdom revealed that fish meal with oil in it when used in chickens have some effects on the taste of eggs and meat. Thus, oil extraction is not only for oil production but also for quality control of fish meal. Other raw materials for fish meal and oil are the scrap fish from commercial fishing and is estimated at about 20% of the total landed or 4,800 M. T. in the Bicol Region and 4,000 M. T. in the Basin, Area, last 1974.

The project benefit area is potentially the Basin area and more specifically the major fish landing municipalities in terms of more value added and employment opportunities. BFAR statistics showed that 81% of the total fish caught and landed by commercial fishing vessels is in the Basin Area. Moreover, the proposed integrated fishery project of the BRBC in Calabanga will increase the inland and marine fisheries production, further justifying the need for fish processing plants.

## II. Objective

To determine the socio-economic and financial viabi-

lity of establishing an integrated fish processing plant.

III. Project Description

1. Scope of Work -

Priorities will be set on the location of plant site. Balongay is chosen as its top priority since BRSC's integrated area development covers that area and which is intended as a major fish landing station.

The municipality of Camaligan, Camarines Sur is the next priority in so far as running of major fish landing stations is concerned.

2. Schedule of Work -

	<u>Output</u>	<u>Duration</u>
1. Socio-economic survey of the project area.	1. Population patterns	2 weeks
	2. Labor force	
	3. Family income level	
	4. Employment	
2. Survey of quantity of fish landed in the project area & fish landing projection 10 years hence.	1. Potential and projected quantity of raw materials.	1 month
3. Research on equipment suppliers	1. Availability of local equipment	2 weeks
4. Market demand/market supply study	1. Marketing study of fish sausage, fish	1 month

oil, and fish meal

- |                                      |   |         |
|--------------------------------------|---|---------|
| 5. Engineering research              | 1. Optimum plant capacity ltd. by raw material supply | 1 month |
| 6. Report writing and preparation    | 1. Report packaging                                   | 2 weeks |
| 7. Final submission and reproduction | 1. Pre-feasibility investigation report               | 2 weeks |
3. Output of the Pre-feasibility shall be in the form of:
1. Investigation report of the socio-economic viability of an integrated fish processing plant.
  2. Capacity, plan, design and other engineering specifications of the proposed integrated plant.

IV. Requirements

A. Manpower

	<u>Agency</u>	<u>Man-months</u>
1 Study Coordinator	BRDC	3
1 Fish Processing Technologist/Study Leader	BFAR	3
1 Financial Analyst	BRDC	1
1 Industrial Engineer	BFAR	2
1 Civil Engineer	BRDC	1
1 Market Analyst	BRDC	2
1 Fishery Food Technologist	BFAR	2
2 Research Assistant	BFAR	3



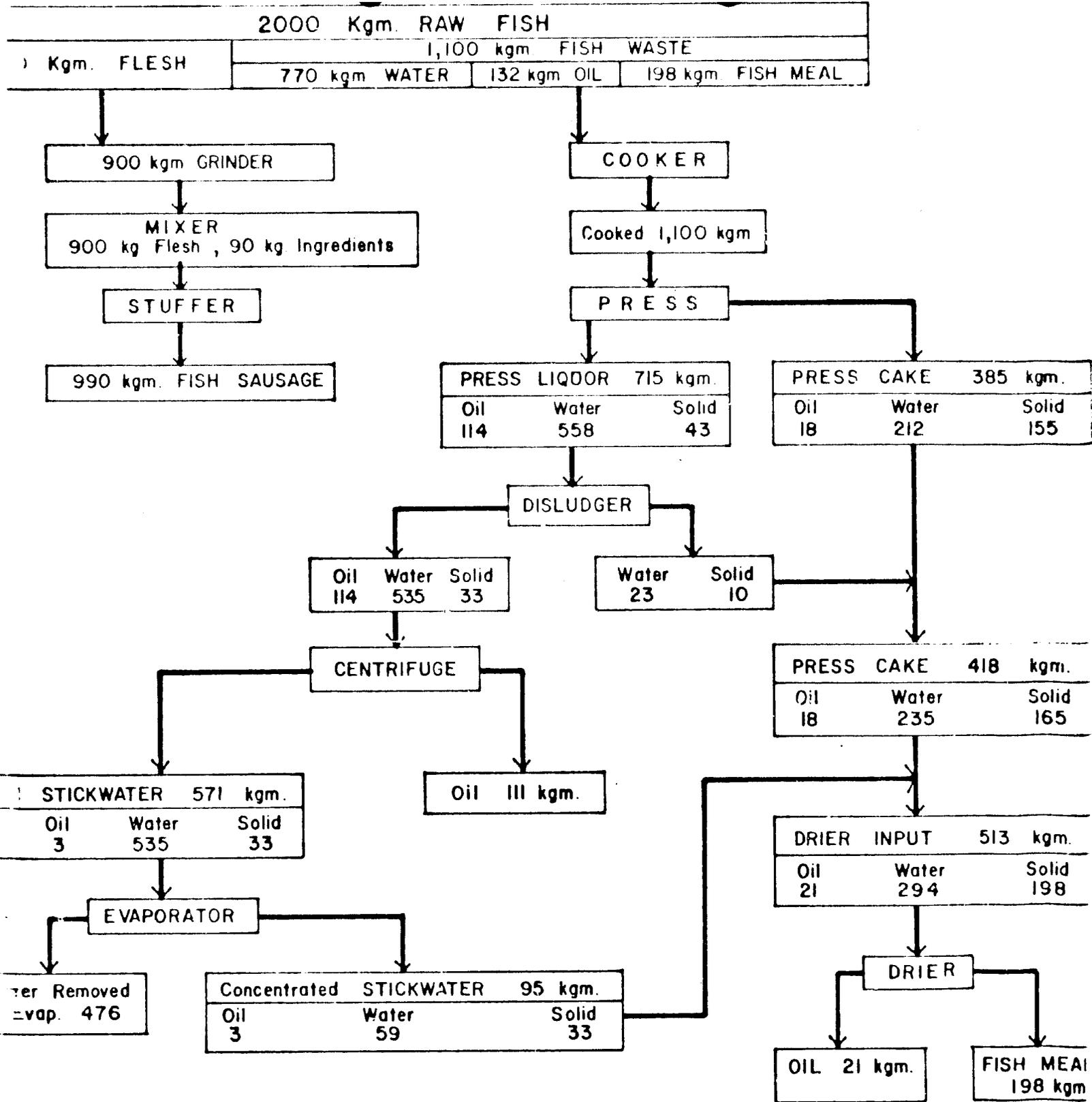


DIAGRAM SHOWING THE INTEGRATION OF PROCESSES NECESSARY TO PRODUCE THREE KINDS OF PRODUCTS

## COLD STORAGE SYSTEMS

### I. RATIONALE

Currently, several agricultural commodities in the basin area whether produced locally and or imported for consumption could be marketed with increased profits and/or provided at better quality and at a lower price to consumers. These commodities are those which could be stored and/or distributed under temperature-controlled conditions, if adequate and low cost facilities (both stationary and mobile) were available.

Some of these basin-produced commodities are: (1) red meat (pork, beef, chicken, rabbit meat); (b) eggs and dairy products; (c) fishery and other aquatic products; (d) tropical fruits (like papaya, pineapple, mangoes and orange); and (e) Leafy vegetables (most of these are basin-consumed and some are shipped out). A substantial number of pineapple and mangoes however are shipped into the basin to supplement local production in meeting market demand.

Red meat could be marketed to Manila with less shrinkage if mobile cold storage facilities were available. Recent studies have shown that substantial loss in weight occurs when shipping live hogs.\* This is not to mention that when red meat could be frozen, seasonal instability

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\*Darrah Al, Feasibility Study of An Integrated Cold Storage and Slaughterhouse Complex in the Naga Area, 1975

of consumer prices could be reduced within the basin itself. Thus, there is potential savings/profit, the benefits of which could be passed on either to the producer or middle-man/merchant. Producers can be motivated to produce more, with stable and adequate marketing conditions and facilities. Furthermore, consumers can have reasonable expectations for low-cost protein-full diets.

Fishery products could be available in greater quantity and/or lower cost to basin consumers and processors if cold storage facilities were available. Considering that spoilage rates are about 20 percent of the current fish catch\* and that transport costs of fish-carrying boats to the Manila/Navotas markets have been prohibitive, fish prices in the consumers market could be substantially reduced and quality improved with adequate cold storage. Producers likewise with mobile cold storage vans could market their produce to Manila and other markets without encountering high handling and storage costs. There is a potential of not only stabilizing price both in the producer and consumer market, but even of lowering them.

A more plentiful supply of fruits could be shipped into the basin at a lower cost per unit if spoilage were diminished. Again, cold storage facilities would facilitate this.

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\*BFAR Regional Office, 1976

Definitely, an overall scheme for providing both stationary and mobile cold storage facilities should be seriously studied as one system. This is necessary if agricultural production targets, in fact are to be met in the Bicol River Basin and to facilitate the initial benefits of such increased production to be spread to the basin populace in terms of low-priced food for nutritional diets.

Current developments within the basin area indicate that immediate consideration be attached to this type of study. Within the next two years, rural electrification and the Manila South Road will become a reality. In the next five to eight years, farm to market roads within the basin area will be in place; there will already be a marketable surplus of agricultural production especially in fruits, leafy vegetables and fishery products.

Relatively, inexpensive power will make possible the low-cost operation of stationary cold storage facilities (ice plants, refrigerators, etc.). With the improved Manila South Road, new markets will be open for agricultural produce. Thus developing some orderly system of refrigerated transportation within the next two years appears feasible.

## II OBJECTIVES

General: To develop an overall plan for effecting the establishment and spacing, both stationary and mobile cold storage facilities in the basin, consistent with the objectives of the Agribusiness development Program.

Specific:

1. To determine and recommend component schemes of such plan phased with developments in inter-modal transport, agricultural production and urban planning.
2. To identify optimum stationary and mobile cold storage facility locations where establishment could immediately be effected for immediate requirements especially in the following commodities: fisheries, fruits and red meats.

## III PROJECT DESCRIPTION

### A. SCOPE OF WORK

1. Coverage - Basin Production and Market Areas; Bicol Region Market Areas; Manila Market Areas.
2. Commodities - Fresh fish and other aquatic products produced in the area; red meat, fruits and leafy vegetables, other commodities to be identified.

3. Facilities - Commercial cold storage and ice making facilities, household stationary cold storage facilities, mobile facilities by rail, air, vehicular.

4. Time Frame to be considered - Minimum of 10 years, maximum of 20 years.

B. TASK/OUTPUTS/DURATION HIGHLIGHTS

<u>Task/Activity</u>	<u>Duration</u>	<u>Output</u>
1. Review, evaluate current data, survey of additional necessary data required	(2 weeks) to (4 weeks)	Location, seasonal annual patterns of commodity production and consumption  Projection of marketable surplus by locality on specified commodities
2. Design methodology survey, evaluate & analyze	(2 weeks) to (4 weeks)	Current location, capacities, fees, capability to expand, capacity utilization, financial performance, markets served, products stored, of both stationary & mobile facilities
3. Quantification of gaps & estimate of market demand for surplus (ex-basin)	(1 week)	Projection of total & to be filled requirements
4. Formulate initial cost & return, benchmarks as ranges of designs	(4 weeks)	Alternative technical design of prototype facilities including cost estimates

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- |   |           |  |
|---|-----------|--|
| 5. Design, survey, evaluate, analyze  | (3 weeks) | Economic Cost Flow models of pre-marketing through Final Destination to wholesaler/retailer for specified commodities (inter-basin & ex-basin) |
| 6. Comparative advantage analysis and marginal cost analysis of methods in filling of facility requirements | (3 weeks) | Trade-off models for stationary & mobile facilities  |
| 7. Review, evaluate, commodity flow study combined with trade-off models                                    | (4 weeks) | Alternative Linear Programming Models  |
| 8. Formulation & identification of analytical model   | (2 weeks) | Financial & Economic Pre-feasibility Analyses  |
| 9. Formulation of factors affecting financial & economic viability of models                                | (3 weeks) | Alternative, Optimal patterns for location, size & time phasing of establishment of facilities   |
| 10. Study of laws, financing, utilities, franchises, others affecting distribution                          | (4 weeks) | Recommendation on institutions & mechanisms necessary to implement schemes/system  |

C. OUTPUTS

1. Identified alternative patterns/models for optimally locating with capacity scaling of stationary cold storage facilities, combined with models prototype

- for optimizing utility of mobile storage facilities.
2. Recommendations on institutions and mechanism which would affect the execution of such establishments and facilities, especially for immediately identifiable projects.
  3. Developed terms of references, when appropriate, for feasibility studies to be undertaken.
  4. Pre-feasibility level studies for accruing economic impact and financial viability of components of the system/plan.
  5. Economic study of cost flow from "farm gate" handling, transport and distribution to final consumer for commodities specified above.
  6. Developed methodology for updating, review, adjusting "optimal patterns" specified above.

#### IV REQUIREMENTS

##### A. Manpower

- 1 Study Coordinator
- 1 Market Analyst
- 1 Financial Analyst
- 1 Transport Economist
- 1 Design Engineer
- 1 Transport Engineer
- 1 Refrigeration Specialist

- 1 Agricultural Economist
- 1 Systems Analyst
- 1 Programmer
- 4 Researchers
- 4 Draftsmen
- 2 Clerk/Typists

B. Budgetary

Local contractor cost is anticipated to be approximately P50,000.00. Foreign exchange cost is estimated around \$20,000.00.

V STRATEGY OF IMPLEMENTATION

The study should be contracted out to a private consulting firm with foreign consultants.

idr:4/14/76



Warehousing Storage  
Feasibility Study Project Proposal

I Rationale

The seasonality of palay production necessitates that a reasonable amount be stored in order to provide continuous supply during off-harvest season. Palay, or rice has to be stored to meet the demand.

Camarines Sur which produces about 9M cavans of palay annually has only 72 warehouses that can accommodate 879,513 cavans.

The evidence of inadequate storage facilities has resulted to palay being transported out of the region during harvest season, only to be bought back during lean months. Subsequent findings revealed that because of this storage inadequacy 800,000 cavans or an equivalent of forty million pesos (P40,000,000.00) is lost either by natural or unforeseen causes, especially during post harvest.

The National Grains Authority has estimated that additional warehouse and storage facilities are needed to accommodate 2M cavans of palay.

A more in depth study on this project will lead to the determination of size, location and volume of storage facilities best suited in the area. Supply and demand could undeniably be equilibrated with optimum output result; losses could be minimized or eliminated, and, new and modern approaches to warehousing and storage could be adopted— thus, aiding the government program of self-sufficiency.

## II Objectives

1. To develop an over-all plan designed to meet the warehousing needs of the region up to year 2000.
2. To develop a scheme for private sector participation in the warehousing plan in the basin area.

## III Scope of Work

- A. Survey present networks of warehousing facilities
- B. Determine development plans of the NGA
- C. Project the need for warehousing facilities in the region
- D. Determine to what extent present and planned facilities will meet the needs of the region
- E. Pinpoint deficient areas in the region
- F. Determine the types and sizes of facilities needed
- G. Compute estimated costs
- H. Distribute data to the private sector thereby encouraging investors
- I. Determine alternative methods of obtaining needed facilities.

## IV Outputs

1. Pre-programmed establishment of optimally located and capacity-scaled warehouses up to the year 2000, subject to review every five years.
2. Priority programming will be given to grains and feedgrains warehousing with potential for expanding coverage to copra, abaca, sugar and essential input commodities to agricultural production.

3. Alternative schemes for furnishing the establishment of warehouses.

V Schedule of Work

	<u>Duration</u>
1. Survey present situation including present plans	3 weeks
2. Project the needs	2 weeks
3. Determine whether needs will be met	1 week
4. Pinpoint deficient areas	2 weeks
5. Determine types and sizes of facilities needed and costs	1 month
6. Draw up conclusions and distribute	1 month
Total time required:	3 months

VI Manpower Requirements

	<u>Duration</u>
1 Study Coordinator	3 months
1 Computer Programmer	3 months
1 Senior Researcher	3 months
1 Agri-business Apccialist	3 months
1 Market Analyst	2 months
1 Industrial Engineer	1 month
1 Agricultural Engineer	1 month
1 Economist	3 months
5 Researchers	3 months
1 Clerk-Typist	3 months

VII Budgetary Requirements

Salaries/Honorariums/Allowances	P 9,500
Supplies and Materials	5,500
Travel Expenses	8,000
Contingencies	<u>2,000</u>
<b>TOTAL</b>	<b><u><u>P 25,000</u></u></b>

VIII Implementation Strategy

This project will be coordinated by the BRBC-PO Agribusiness Staff and will be participated in by the different government line agencies concerned with the project.

Initially, these agencies are NGA, DIGCD, BPI, UPLB, IRRI, and BRBC-PO.

A Memorandum of Agreement shall be executed between the Program Office of BRBC and the cooperating line agencies. The memorandum will spell out the role they will play in the implementation of the project, their working inter-relationships to attain the objectives of the project and who will be the lead government agency. The program of work to be developed shall be translated into either a PERT/CFM network or GANT CHART to guide the implementors of the time frame of the project.

Cooperating line agencies shall be encouraged to fully participate in this project study.

INDUSTRIAL PROFILE STUDY  
ON POST HARVEST EQUIPMENT  
MANUFACTURE IN THE BICOL REGION

I RATIONALE

The Philippines cannot afford to waste palay never-the-less 10% of the palay grown is wasted in post harvest activities such as, harvesting, threshing, drying, to milling. One of the ways to reduce this staggering wastage problem is to introduce modern post harvest equipment such as, rice threshers and rice dryers. These equipments can be manufactured in the region as demonstrated by several small producers. What must be done now is to encourage more firms to produce and/or to encourage diversification of present firms along these lines. This can be done with thorough knowledge of the industry. Presently UPLB-IRRI is looking into the Socio-Economic aspects of introducing post harvest equipment in Bicol Fields. With the socio-economic information generated by them and a thorough analysis of the local market situation it will be relatively easy to encourage manufacturers.

The alternative to non-development of this industry is the continued waste of palay which is no real alternative. Without aid the private sector will undoubtedly develop but only much later than if a government agency steps in and offers aid.

The magnitude of the total waste per year is somewhat staggering. Of an estimated 7 million cavans harvested in Camarines Sur in 1975, 10% or 700,000 cavans were wasted. At the market rate of 50 pesos per cavan, the total cost of this wastage is approximately 35 million

pesos. There can be no doubt that something must be done to stop this waste.

## II OBJECTIVES

1. To contribute to grain self-sufficiency in the region by eliminating waste.
2. To improve the efficiency of the industry by pin-pointing problem areas or bottlenecks in production, marketing, financing and the like.
3. To encourage the production of small post-harvest equipment by making information on markets, production and technological improvements available to industry members and investors.

### Specific

1. To produce an industry profile that would contain among others important base-line data for the guidance of planners and interested members of the industry.
2. To provide current information on the technological aspect of the industry to facilitate the introduction and use of equipment that are both efficient and economical to operate.
3. To provide information that will guide the government in devising incentives to encourage the growth of the

### III SCOPE OF WORK

1. Do a thorough market analysis estimating total market size and the type of equipment which would be in greatest demand.
2. Develop projections for the sales of equipment for the next 5 years.
3. Analyze present production capabilities and determine the best method of expanding those capabilities whether through enlargement of present facilities or construction of new facilities.

### IV STRATEGY OF IMPLEMENTATION

A study team composed of personnel from the BRBC, PFDO, UFLB and MASIKAP shall be formed to conduct the study through an appropriate Memorandum of Agreement.

The study should last for not more than three (3) months.

### V ORGANIZATION AND MANAGEMENT

The study Team shall be composed of the following:

	<u>POSITION</u>	<u>AGENCY</u>
1	- Study Coordinator	BRBC
1	- Market Analyst	DOT
1	- Agricultural Engineer	UFLB
1	- Industrial Analyst	MASIKAP/DI

### VI BUDGETARY REQUIREMENT

It is anticipated that the cost of the study will be P25,000

## AGRICULTURAL/AGRO-INDUSTRIAL CREDIT STUDY

### **I INTRODUCTION**

When considering the overall development of the Bicol Region a very important element to consider is credit. Unfortunately up to now the BRBC has not developed a comprehensive credit development plan for the basin. Considering the importance of credit in development it is imperative that such a plan be developed. An indication of the problem can be seen by the fact that in 1975 there were 26 rural banks with a loaning capacity of P55,126,000 pesos.<sup>1/</sup> The total credit demand in 1975 for agricultural commodities was P120,418,000.<sup>2/</sup> It can be seen by the disparity between these figures that something must be done to increase the loaning capacity of the banks. The proposed study will help determine what must be done.

### **RATIONALE**

The problems to be dealt within the study are a lack of sufficient data on credit in the area and the lack of a comprehensive plan for credit in the region. The alternative to develop a plan is to allow market forces to rule on who should and shouldn't receive credit at market interest rates. Since this method would not generate sufficient credit to maintain the BRBC-PO proposed development

1/ Derived from CB's 4 year program.

2/ Based on BRBC-PO estimates.

plan for the region, something must be done to speed up credit development. The Central Bank has several on-going programs but these programs should be integrated into the development plans for the region thereby producing a complete program.

The beneficiaries of this program would be the farmers who would be able to avail of the credit generated by the program. With this credit the farmers would be able to increase their production thereby increasing their income. Small industrialists would also benefit by the programs to aid in agro-industrial development that would result from a comprehensive credit development program.

## II OBJECTIVES

### General

1. Provide information necessary to develop a comprehensive credit development plan for the Basin Area.
2. Determine the credit needs for farmers in the region.
3. Determine the credit needs of agro-business and agro-industries in the area.

### Specific

1. Location and quantification of demand supply gaps in the credit needs of the area.
2. Locate any areas in need of additional banking

- facilities and determine what facilities are needed.
3. Determine why and how the present programs work or don't work.
  4. Locate any overlap in services among the various programs.
  5. Assess the impact of social norms on the credit policies of banks.
  6. Develop programs to meet the needs of the area.

### III SCOPE OF WORK

1. Quantify the demand for credit by agriculture and by agro-business.
2. Quantify credit presently supplied to agriculture and agro-business by financial institutions in the area, including rice mills.
3. Project the total demand for credit by each sector to the year 2000.
4. Project the total supply of credit to the year 2000 for each sector based on current growth trends.
5. Quantify the gaps between demand and supply for each sector.
6. Analyze banking institutions in the region developing a profile for each considering all of the following items:

Total agricultural loans

Total agro-business loans

Past due rates

Average loan length

Service area

Net worth

Loan capability

Growth rate

Net income and return on investment

7. Locate areas which are not now serviced by banking institutions.
8. Analyze the impact of social norms on the credit program of the banks, particularly historical relationships with millers and traders who loan money.
9. Do a pre-feasibility analysis on the possibility of introducing a regional banking facility to handle agricultural and agro-business financing.
10. Recommend a program that will deal with the problems outlined in the study.

#### IV SCHEDULE OF WORK

- |                              |         |
|------------------------------|---------|
| 1. Quantify credit demand    | 2 weeks |
| 2. Quantify credit supply    | 1 month |
| 3. Project demand for credit | 2 weeks |

- |   |          |
|---|----------|
| 4. Project supply of credit   | 2 weeks  |
| 5. Quantify demand supply gaps                                      | 1 week   |
| 6. Analyze banking institutions                                     | 2 months |
| 7. Locate areas not now served by banking institutions              | 2 weeks  |
| 8. Analyze the impact of social norms on the banks                  | 2 months |
| 9. Do a pre-feasibility analysis of a regional banking institutions | 2 weeks  |
| 10. Program recommendations and development                         | 1 month  |

Estimated total time required 4 months.

V MANPOWER REQUIREMENTS

- |                            |           |
|----------------------------|-----------|
| 1. Study Coordinator (1)   | BRBC      |
| 2. Banking Specialist (1)  | CB-BRBSLA |
| 3. Bank Manager (1)        | Contract  |
| 4. Social Psychologist (1) | Contract  |
| 5. Economist (1)           | BRBC      |
| 6. Researchers (8)         |           |
| 7. Clerk/Typist (1)        |           |

VI BUDGETARY REQUIREMENTS

Salaries	P22,900.00
Travel & per diems	11,000.00
Supplies	2,000.00
Contingency and miscellaneous	<u>4,100.00</u>
TOTAL COST	<u>P40,000.00</u>
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**VII IMPLEMENTATION STRATEGY**

This study will be undertaken by the different line agencies concerned and their participation shall be co-  
vered by the appropriate memorandum of agreement.

idr:4/14/76

PRE-FEASIBILITY STUDY OF RICE STALK WALLBOARD  
Terms of Reference

**I RATIONALE**

Camarines Sur, a major rice producing area in the country, has at present about 144,492<sup>1/</sup> hectares effective crop area. By 1980, it is estimated that the area will have about 162,992 hectares of effective cropland capable of producing about 291,911.8 tons of palay<sup>2/</sup>.

A process of manufacturing wallboard from rice stalks has recently been perfected. The process would not only utilize waste material which is normally burned or allowed to rot in the field but would earn additional income for rice farmers. At the same time, the process could turn out cheap wallboard materials.

Considering, that the proportion of rice grains to the entire rice plant is only 12% while ricestalk is about 87%<sup>3/</sup>, it is estimated that by 1980, the amount of ricestalk that would be produced is about 2,077,502 metric tons.

Utilization of by-products which are wasted presently will definitely be a big boost to the basin's economy in terms of generating additional value-added and employment.

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<sup>1/</sup> Bureau of Agricultural Extension

<sup>2/</sup> Estimated by BRBC Intermodal Transport Study

<sup>3/</sup> Calculated on the basis of Rice Yields and Weight of Stalk at Bicol Rice and Corn Experiment Station.

II OBJECTIVES

1. To determine the technical, economic and financial viability of rice stalk wallboard manufacturing.
2. To identify the by-products of rice stalk wallboard manufacture and their potential uses.

III DESCRIPTION

A. Scope of Work

The study should determine the technical, financial and economic viability of the project. Social benefits and financing requirement should be determined. It should also look into the following:

1. Technological process and problems
2. Estimate of market demand
3. Identification of product-utility and alternate uses
4. Analysis of social benefits
5. Estimates of economic benefits.

B. Schedule of Work and Output

The corresponding schedule of activity and output is presented below:

<u>Activity</u>	<u>Duration</u>	<u>Output</u>
A. <u>Engineering</u>		
1. Technological Study	1 week	1. Recommendation of the production process, that should be used. Identified by-products of manufacturing and potential uses. Production flow & plant design.

<u>Activity</u>	<u>Duration</u>	<u>Output</u>
2. Machinery Evaluation	2 weeks	2. Machine efficiency, fuel economy, basic cost, operational cost, production cost per unit including minimum, optimum and maximum output rate of the machine. Manpower and power requirements.
<b>B. <u>Economics</u></b>		
1. Supply Demand Study	1 week	1. Present & future supply of raw materials. Purchasing strategy. Identified possible industries that would complete demand for raw materials. Optimum plant location.
2. Product Study	1 week	2. Present & future uses including alternative use of product. Identified possible linkage industries.
3. Market Study	1 month	3. Present & future market of the product, prices location including marketing strategy. Optimum plant size.
<b>C. <u>Socio-Economic</u></b>	2 weeks	Additional employment and income generated both on-farm and off-farm.

The engineering study should be translated in terms of machinery/equipment selection and the cost of basic machinery and related facilities.

Economic analysis using net value added and net internal rate of return including benefit cost should be determined. A financial analysis must likewise be done.

The entire study including report writing is estimated to be completed in 3 months time.

#### IV REQUIREMENTS

##### A. Manpower

	<u>Man-months</u>
1 - Study Coordinator	3
1 - Study Director/Economist	3
1 - Financial Analyst	1
1 - Market Analyst	3
1 - Industrial Engineer	2
1 - Civil Engineer	2
1 - Agronomist	1
3 - Research Assistants	3
1 - Clerk-Typist	3

##### B. Budgetary Estimates

The amount of P20,000.00 is estimated to cover the entire phase of the study, broken down as follows:

Salaries/Boncrarium	P 10,000.00
Traveling Expenses	4,000.00
Supplies and Materials	<u>6,000.00</u>
TOTAL	<u><u>P 20,000.00</u></u>

V IMPLEMENTATION STRATEGY

This study should be contracted to a private contractor who has the capability to do the job or to a government agency like FOPRIDECOM or NIST. If no contractor is found a multi-agency study team shall be organized. In all cases, a BRBC study coordinator shall be involved.

A Memorandum of Agreement shall be instituted by and among concerned agencies which shall define the terms and conditions of the study.

vi\*solano  
14 Apr '76

## Terms of Reference

### MARKET DEMAND STUDY

#### I RATIONALE

One of the most important tools needed for planning is data. Presently, there is a serious shortage of demand data for agricultural commodities. If planners are to develop the plans necessary for agricultural development they must have projections for demand taking into account changes in demand as income and tastes change. With this data planners can help keep up with the changes in demand. Although it is sometimes difficult to justify such data gathering it must be done if important decisions, such as the locations of warehousing facilities, are to be made with any degree of success.

At the present time there is a serious lack of demand data for agricultural commodities in the region. This lack of demand data makes it extremely difficult to plan effectively. Demand data would provide insights into problems such as the location of warehousing facilities and markets. It would also point to any excess capacity that can be sold to other regions. Demand data would also point out any dramatizing the need for a development program in that area.

There are very few real direct beneficiaries from this data but there are uncounted indirect beneficiaries. Planners could be classified as direct beneficiaries as this data

is very important to their work and their work benefits a large number of people in the area. Investors could also gain some benefits from the data as it would allow them to make better investment decision and it would also point out possible investment alternatives.

## II OBJECTIVES

1. Provide reliable estimates of current market place transactions volume in the Basin and selected metropolitan cities.
2. Develop historical trend for all types of agricultural commodities.
3. Develop a study methodology to update and replicate the data annually.

## III DESCRIPTION

### A. Scope of Work

1. Estimate consumption and market demand for the following commodities:

Crops - Grains and milled grains, leafy and fruit vegetables, corn, tubers and root vegetables, onion and garlic, legumes bananas, citrus, coffee, cacao and pineapple.

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**Fisheries** - shrimps, lobsters, crabs, fresh  
and processed fish.

**Aquatic** - sardines, mackerel, tuna, fish meal,  
bangus, and bangus fog.

**Livestock** - hogs, large cattle, cattle.

**Poultry** - chicken and eggs

Data gathered should include:

1. The specific market location and type.
  2. Nature of the transaction.
  3. Coverage should include quarterly, seasonal, monthly and weekly.
  4. Wholesale and retail prices and trends dating back 5 years if possible.
2. Project the market demand up to 1990 taking into account:
1. Income elasticities, explicitly stating the income elasticities coefficient.
  2. Positive cross elasticities, up to two other food items, explicitly stating the gross elasticity coefficient.
  3. Negative gross elasticities up to two other food items explicitly stating the gross elasticity coefficient.
3. Develop a tandem methodology for updating the study

yearly at a fraction of the initial study cost.

4. Estimated consumption for industrial commodities including:

- a. Cement
- b. Fertilizer and agricultural chemicals
- c. Iron bars
- d. Corroated GI sheets
- e. Lumber
- f. Other important constuction materials
- g. Fuel
- h. Grain
- i. Agricultural Lime
- j. Raw agricultural products

<b>B. <u>Schedule of Work</u></b>	<b><u>Duration</u></b>
1. Estimate consumption and market demand	4.5 months
2. Project the market demand up to 1990	2 weeks
3. Develop a tandem methodology	1 month
4. Write up of conclusions	1 month
Total time required for study	6 months

**IV BUDGETARY REQUIREMENTS**

₱115,000 based on experience derived from prior studies.

**V IMPLEMENTATION STRATEGY**

The study should be sub-contracted to the private sec-

tor or in combination with the BAECON. The private sector can undertake the survey design and training of researchers. BAECON shall provide the researchers, but the contractor shall retain the responsibility to ensure the study results. BRBC-PO shall be responsible for the final evaluation of the study. Using this type of methodology, will provide the best alternate due to the fact that no special hiring of personnel will be required thereby, providing a qualified staff at the least possible cost.

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## TERMS OF REFERENCE

### FEEDMILL COMPLEX FEASIBILITY STUDY

#### I. RATIONALE

A limiting factor in the promotion and growth of the livestock industry in the Bicol Region is the irregularity in the supply of quality mixed feeds and its high price.

Present feedmills in the region, three (3) in Camarines Sur and two (2) in Albay, have operated in a sub-commercial thus inadequately supplying the needs of the poultry and livestock raisers. As a consequence, a number of operators are mixing their own feeds which is not only uneconomical but oftentimes results in unbalanced feed mixtures. Others, get their supply of mixed feeds outside the region, which are sometimes abruptly cut during bad weather.

Moreover, a large volume of available raw ingredients are shipped outside the region only to be brought back in the form of mixed feeds.

Recent studies by Darrah et al.<sup>1/</sup> identified the Bicol Region as an ideal location for a feedmill because of available raw materials and inadequacy of mixed feeds.

In addition to utilizing available raw materials and preventing out shipment, establishment of the feedmill plant in the area will stabilize prices of feedgrains and induce its production. Moreover, the feedmill plant could supply

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<sup>1/</sup> Darrah et al, Feasibility of Feedmill Plant in Naga City, 1975.

the necessary volume of feeds needed to promote and support the targeted production in the Livestock and Poultry Development program of the BRBDP. Additional value added and employment opportunities will also be generated.

## II. Objectives

1. To determine the optimum feedmill size.
2. To evaluate the financial and economic viability of the project.
3. To identify alternative plant site.
4. To determine service area of the feedmill.
5. To determine availability of raw ingredients.
6. To enhance development of the livestock and poultry industry.

## III. Project Description

### A. Scope of Work

The project will determine the economic and financial viability of the feedmill. It should include selection of the plant size, identification of plant site and determination of available raw materials and substitutes and service area of the feedmill. The size of the market and location, including the possible pollution problems that may arise should be determined.

Basically, the study will focus its activities in the Bicol River Basin area where there is an inter-agency

Livestock Development Program. However, it would include other provinces of the region which are potential market for mixed feeds.

B. Schedule of Work

Activities to be conducted are as follows:

1. Survey of existing feedmills, present operations, capacities and outputs.
2. Updating of list of commercial, semi-commercial and backyard poultry and livestock raisers.
3. Determination of available raw materials (sources and volume and substitutes, present and future).
4. Demand study for mixed feeds (present and future).
5. Compounding of rations with emphasis on nutritional requirement and least-cost formulation.
6. Marketing program.

In addition, the study would include an analysis of the economic benefits of the projects based on Benefit-Cost ratio and Internal Rate of Returns. Value added would have to be reflected in the project study. Moreover, a study on pollution and effects to the health of the workers should be included.

The study, including report writing, is estimated to be completed in 4 months.

C. Output

1. Quantification of the financial requirement of the feedmill including support facilities.
2. Selection of optimum plant size and site.
3. Anti-pollution measures
4. Annual operational cost and income schedule..
5. Economic and financial analysis
6. Projected demand for mixed feeds by type
7. Manpower requirements
8. Identified markets and marketing program

IV. REQUIREMENTS

A. <u>Manpower</u>	<u>Man-months</u>
1 Study Director	4
1 Study Coordinator	4
1 Civil Engineer	2
1 Industrial Engineer	2
1 Market Analyst	3
1 Financial Analyst	1
1 Animal Nutrition Specialist	3
1 Architect	1
4 Research Assistants	4
1 Clerk-Typist	4
1 Ecologist	1
1 Health Officer	1

B. Budgetary Estimates

It is anticipated that the cost of this study will approximately be P20,000.00.

V. STRATEGY OF IMPLEMENTATION

An inter-agency study team shall be organized for the purpose of this study. BAI shall be the lead agency in this study and shall designate a Study Director. Study coordination shall be the responsibility of a BRBC Study Coordinator. Other agencies that maybe tapped for the expertise are: NFAC, BAECON, UPLB, BOI and NEDA.

A memorandum of agreement shall be instituted by and among the government agencies concerned which shall define the terms and conditions of the study.

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PROPOSED TERMS OF REFERENCE  
FOR A FEASIBILITY STUDY  
OF A CEMENT PLANT

I RATIONALE

There is a continuous need for cement. Although there is an adequate productive capacity at present in the Philippines as a whole, there will be a shortage in the future as the demand continues to increase with the growth of this nation. The Bicol Region now pays high transportation costs and experiences delay in cement shipments which could be avoided if it were produced locally.

There are four basic ingredients for cement which can come from a wide variety of sources. These four ingredients are listed below:

1. Lime (calcareous)
2. Silica
3. Alumina (argillaceous deposits)
4. Iron (ferriferous materials)

These four materials are derived from the naturally occurring products listed below and cement manufacturing processes are adjusted depending on which materials are most readily available.

Item 1. Limestone

Cement rock (clayey limestone)

Oyster shells

Coquina

Marl (shells)

Item 2, 3, and 4

Clay

Shale (must be finely ground)

Silica sand

Iron Ore

The ascertaining of an assured supply of raw materials 5, 10 and 20 years in the future, based on expected annual production, should be a major determinant of plant location. Extremely economical operation in the first 5 years should not be selected if the plant will be obsolete in 10 years because of the transportation of raw materials.

Listed below are additional benefits which will accrue to the area selected for the cement plant and areas from which additional materials will be extended:

1. Increased employment possibilities.
2. Provide manpower training in some skilled jobs.
3. Improve construction base in the Bicol Region.

II OBJECTIVE

To determine the technical, economic, financial and market viability of the project.

III DESCRIPTION

A. SCOPE OF WORK

a. Engineering

Investigate possible sites for cement plant location taking into account the items listed below, but do not limit the investigation to these items if other pertinent items are found to be relevant.

1. Transportation of raw materials to plant.
2. Processing raw materials at the source or at the plant.
3. Crushing and Grinding facilities.
4. Transportation of raw materials by truck, sea or rail.
5. Loading and unloading in the most economical manner.
6. Estimate quantities of raw materials available at all locations throughout the Bicol Region which have direct relevance to cement plant location and production in Camarines Sur.
7. Locate additional roads needed and estimate the cost.
8. Make a preliminary design of a site for the cement plant.
9. Make a preliminary design of a cement plant.
10. Make a preliminary design for materials handling at relevant raw material sites and at the cement plant and estimate all volumes processed at each step (daily, weekly, monthly and yearly).

11. Estimate desired plant production for the first 20 years of operation.
12. Estimate traffic of all types generated at each facility involved in raw materials, processing raw materials, and making cement or the procedures leading to it. This includes all loading and unloading facilities required to serve the cement plant and its production.
13. Estimate costs of all facilities and present reasonable alternative designs which should be subjected to economic analysis.
14. Make preliminary designs or specifications and cost estimates of the following types of equipment needed at raw materials processing centers and at the cement plant and make preliminary designs or specifications and cost estimates of other equipment which is found to be needed.
  - a. Rock crushers, screens and other equipment needed if shale is used.
  - b. Rock brushing and other equipment needed if quartz sand is required.
  - c. Rock crushing and other equipment needed at limestone quarries.
  - d. Rock crushing and other equipment needed at gypsum quarries.

- e. Equipment needed if clay is used.
  - f. Equipment needed if iron ore is used.
  - g. Other equipment such as power shovels, cranes, drag lines, front end loaders, trucks, mini railroads, conveyors, etc., needed for handling raw materials.
  - h. Estimate storage facilities needed for raw materials.
15. Plant Equipment - as mentioned in item 14, make preliminary designs or specification and cost estimate of all plant equipment listed below or found to be needed in the course of this investigation.
- a. Storage, crushing equipment and screens etc.
  - b. Vibrating screens and hammer mill.
  - c. Bin storage for various aggregates.
  - d. Conveyors.

Dry Process

1. Clay and rock dryers
2. Conveyors, screens, bins, and lifting equipment
3. Vertical grinding mill
4. Tube mill and air separator
5. Dry mixing and blending silos (2 or 3)
6. Ground raw material storage silos (6+)

Wet Process

1. Clay wash mill
2. Clay slurry storage basin
3. Slurry feeder
4. Proportioning equipment - conveyors, screens, bins and lifting equipment
5. Ball mill
6. Tube mill
7. Dry raw and grinding and storage (3 silos +)
8. Slurry mixing and blending tanks (3 silos +)
9. Slurry storage basins (1 or 2 large tanks)

Kiln Drying

1. Kiln feeder and conveyors
2. Rotary kiln (10 feet to 18 feet in diameter and 100 to 600 feet long)
3. Dust collector (3 to 6 bins)
4. Smoke stack
5. Clinker cooler
6. Clinker storage
7. Gypsum storage
8. Proportioning equipment
9. Ball mill
10. Tube mill
11. Air separator
12. Conveyors

13. Cement storage silos - 6 to 15 silos depending on plant capacity. Fluctuations in demand require that storage be provided for 10% to 24% of the yearly production.
14. Packing department
15. Shipping department
16. Office and laboratory

b. Economic

1. Estimate regional cement needs for the next 20 to 25 years.
2. Estimate Philippine projected cement capacity for the next 20 to 25 years to ascertain needs for a cement plant in the Bicol Region.
3. Estimate growth in construction in the Bicol Region for the next 20 to 25 years.
4. Estimate value of cement production to the region for the next 20 to 25 years.
5. Estimate savings to the region as a result of the presence of the cement plant.
6. Estimate increase employment directly attributable at the cement plant (mining, transportation and processing of raw materials and the shipping of cement).
7. Estimate total benefits to the region as a result of the cement plant.

8. Benefits received should be grouped in regard to whether the recipients are low income, middle income or high income groups.
9. Make a separate estimate of indirect benefits which will accrue to the region as a result of the increased activity promoted by the greater efficiencies derived through having a local cement plant.

o. Socio-Economic

1. Estimate area required for cement plant site to ensure local residents are not disturbed by noise, fumes, dust, vibration, and traffic.
2. Estimate measures needed to ensure separation of raw materials mining and processing from local residents.
3. Estimate benefits from added employment.
4. Estimate changes in consumption and expenditure patterns as a result of added income.
5. Estimate changes in income levels and which income levels groups are most effected.
6. Estimate the impacts on the residents (both positive and negative) of the new cement plant and related processing equipment at raw materials sites.

B. SCHEDULE OF WORK	<u>DURATION</u> (weeks)
1. Preliminary Survey of Cement Plant, Raw Materials in the Bicol Region.	3
2. Preliminary site selection for cement plant.	4
3. Preliminary design of cement plant and raw materials processing facilities.	4
4. Plan and acquisition program for raw mate- rials sources.	2
5. Evaluate transportation alternatives for raw materials.	2
6. Evaluate loading, unloading and handling techniques to be used in raw materials processing.	4
7. Design and evaluate additional roads needed and estimate costs.	4
8. Estimate desired cement plant production for the first 20 years of operation.	4
9. Estimate traffic generated by all facilities associated with extracting raw materials and with cement production and shipping.	2
10. Estimate costs of all facilities and costs of acquiring property needed.	2
11. Make cost estimates of all equipment needed at the raw materials processing centers and at the cement plant.	4

	<u>DURATION</u> (weeks)
12. Make an equipment schedule including guaranteed delivery dates of all equipments needed in the cement plant and at raw materials processing centers.	3
13. Estimate storage facilities needed at all phases of raw materials handling and for cement plant processes and output.	2
14. Estimate building construction schedule at the cement plant including the office and laboratory.	3
15. Develop a reasonable shipping schedule and identify volumes needed by province if possible.	2
16. Estimate Regional cement needs for the next 20 to 25 years.	4
17. Estimate Philippine projected cement capacity for the next 20 to 25 years.	4
18. Estimate value of cement produced for the next 20 to 25 years.	2
19. Estimate savings to the region as a result of the cement plant.	1
20. Estimate increased employment directly attributed to the cement plant (mining, transportation and processing of raw materials and the shipping of cement).	1

	<u>DURATION</u> (weeks)
21. Estimate total benefits to the region as a result of the cement plant.	3
22. Group benefits to show whether recipients are members of low, middle or high income groups.	1
23. Estimate secondary benefits accruing to the region as a result of the cement plant.	2
24. Design all facilities to ensure that present or future residents are not disturbed by noise, fumes, dust, vibration and traffic.	3
25. Estimate how much the average income is increased for low, middle, and high income groups.	1
26. Estimate date when facility can be in full operation.	2
	<hr style="width: 10%; margin: 0 auto;"/> 69 wks.

C. OUTPUT OF THE FEASIBILITY STUDY

1. Develop a cement plant and support facility package which will serve the Bicol Region and Camarines Sur economically in the near and distant future. This should be accomplished while minimizing social and economic costs. It should be shown that the cement facilities will result in greater economy of natural resources and energy and that it will promote employment, increased exports

(or reduced imports into the region), increase mining, increase construction and industrial potential. In addition it should be shown how development will be promoted, and how this development will raise per capita income or otherwise increase the self-sufficiency or development potential of the areas.

2. A recommended location for the cement plant which will minimize shipping costs, raw materials handling and transportation and be economical to operate.
3. A proposed land use plan for affected areas for 1980, 1985 and the year 2000.

#### IV REQUIREMENTS

A. <u>Manpower</u>	<u>Man-Months</u>	<u>Agency</u>
1 Study Coordinator	6	BRBC
3 Civil Engineer	6	DPH
3 Economist	6	BRBC
2 Structural Engineer	4	DPH
4 Draftsman	6	BRBC
1 Land Evaluator	1	DPH
3 C.E. Aide	6	BRBC
2 Clerk/Typist	6	BRBC
1 Soils Engineer	3	DPH
3 Researchers	6	Direct hire
3 Drivers	6	Direct hire

<u>Manpower</u>	<u>Man-months</u>	<u>Agency</u>
1 Cement Plant Specialist	3	
1 Materials Handling Specialist	3	DPWTC
1 Geologist	2	Bureau of Mines
1 Urban Planner	1	DPWTC
1 Mechanical Engineer	4	
1 Rotary Kiln Specialist	1	
1 Transportation Planner	1	DPWTC

B. Budgetary Estimates

Salaries/Honoraria	P 76,500.00
Travel Expenses	50,000.00
Miscellaneous Office Expenses	10,000.00
Contingencies	<u>13,500.00</u>
<b>TOTAL</b>	<b><u><u>P 150,000.00</u></u></b>

V IMPLEMENTATION STRATEGY

This study should be contracted to a private contractor who presents capability to do the job, or to a government agency. If no contractor is found, a multi-agency study team shall be organized to do the task. In all cases, coordination shall be the responsibility of a BRBC study coordinator.

A memorandum of agreement by and among concerned agencies shall be developed which shall define the terms and conditions of the study.