METHODOLOGY FOR STUDYING LINKAGE EFFECTS OF AGRICULTURAL MODERNIZATION

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I. OVERVIEW AND OBJECTIVES

Analyzing the impacts which agricultural modernization of a subsector has on the overall economy is the focus of this phase of the IICA research program. While Phase I provided insights into modernization in eight subsectors, Phase II will address the issue of spinoffs in a more detailed and structured manner. A methodology is being provided which will focus the work of Phase II and result in a degree of consistency of approach between case study examples. This consistency is necessary to ensure that the quantitative and qualitative assessments of spinoffs are comparable between cases and that conclusions can be drawn on a number of critical issues.

Phase I of this project began the process of identifying the elements of a successful modernization effort. To expand this analysis and provide more detailed evidence of results, the research of Phase II must focus on understanding the dimensions of modernization spinoffs on two levels: (i) assessing the impact on the economy (i.e. how many inputs were purchased or the structure of final demand); and (ii) establishing the process of modernization which brought about those end-results (e.g. are larger firms necessary to produce greater linkages). Phase I clearly showed that both elements are necessary in understanding the importance of modernization and ensuring its capacity to be a guide for other modernization efforts.

While it is simple to prove that positive linkages are built up, it is more complicated to quantify the dimensions of these

spinoffs. Studies in the field to date have focused on merely estimating the impact of agriculture on factors such as overall economic growth, expansion of domestic markets, and contributions to the labour pool. Few studies have moved beyond this level to measure the ripple effects which modernization produces throughout the economy, in not only generating expanded demand but improving efficiency, changing the structure of the economy and improving the benefits gained from development.

Measuring these economic and social effects is a complex process, however. Not only must quantitative indicators be developed, but the research must also provide a better understanding of how the process of modernization takes place at the firm level. While the magnitude of linkages within an economy provides evidence of agriculture's importance, a better understanding of the modernization process increases the capacity to replicate the experience. It is this latter mechanism which has remained most elusive--"how can success be duplicated?".

The objectives of Phase II then are twofold. First, in improving understanding of the significance of agricultural modernization to the overall economy, it is important to ascertain the dimensions of the subsector's impact, including backward and forward linkages, income and employment effects and foreign trade linkages. Indicators can be developed which provide insights into these elements. Second, to maximize the significance and replicability of the modernization effort, it is also important to understand how modernization takes place and

how it can be promoted. Without this, few lessons can be learned from previous experience. To understand this requires moving beyond indicators to developing a better grasp of the overall dynamics of the modernization process.

II. METHODOLOGICAL APPROACH

Attempting to accomplish both objectives is a difficult task given the available models. The analysis must look at both the micro level detail and also the subsector's overall impact on the macro level. While aspects of these models have to be static in the sense of taking a snapshot of reality, the process of modernization is a dynamic one and the keys to success are many times found in the dynamism of factors such as technological change. As well, the process is continually buffeted by changes in critical factors such as prices, weather and policies. This makes the outcome of any analysis much more uncertain and the ability to predict what will happen in the future less likely.

All of these factors played a critical role in the design of the Phase II methodology. Given the financial resource limitations of the project, the development of a complex model to be applied to the case study countries was not possible. Existing models such as input-output models and linear programs were not appropriate due to: their aggregate nature; their lack of insight into how the system moves, and changes are incorporated; and the difficulty in collecting and incorporating appropriate data on which to base these models.

The closing session of the Phase I seminar clearly indicated that what was needed for Phase II was a more dynamic and flexible way of looking at the importance and process of modernization. The construction of such a methodology had to begin with the conclusions of Phase I and provide new primary research into the spillover effects and how to promote modernization elsewhere.

The key findings from Phase I which have guided the development of Phase II methodology are:

a) Modernization must be viewed as something more than a vehicle to increase production. For a modernization effort to be successful a number of factors must be positively impacted: production; productivity; net income (and foreign exchange); employment; subsector efficiency; subsector structure; distribution of benefits; and efficiency of the overall development process. To discuss these impacts requires recognition that each element is important and must be addressed in the methodology.

b) Five factors are important in understanding the process of modernization. These factors are: domestic macroeconomic and sectoral policies; technology; markets; industrial organization; and managerial and intrafirm capabilities. The interplay between these factors dictates how effective the modernization effort will be. Changes in one factor, such as technology, may not automatically transform a subsector. The process

is dynamic with the five factors exerting positive and negative influences on the process.

c) The focus should be on modernization of enterprises not the subsector as a whole. The transformation takes place at the enterprise level. This means that it is important to understand the production process at the firm level and how decisions about production and sales are made.

d) Since transformation occurs at the enterprise level, any attempts to quantify the spinoff effects must also be done at a disaggregated level. Aggregate information, which does not allow flexibility in addressing linkage and other issues, will provide only a fragmented view of the actual and potential spinoffs.

The methodology presented here combines both quantitative and qualitative analysis to establish a general map of interactions within a modernized agricultural subsector. The theoretical approach builds on microeconomics and addresses both supply and demand questions. Four areas of investigation are seen to be important: farm/firm level operations; industrial organization; trade and fiscal regimes; and external marketing arrangements. Within each of these are issues which are important for all case studies and others which have more relevance for particular cases. The adaptations for the Phase II cases will be covered in separate methodology papers. What is presented here is a generic approach outlining the spectrum of

issues which Phase II will cover. The four issues to be covered are dealt with in turn.

1. Farm/Firm Level Operations

Understanding the micro level in terms of the production process, price and cost decision making, and internal and external factors which influence decisions, is a critical first step in addressing the issue of spinoffs arising from modernization. If it is correct to argue that the enterprise level is the priority to modernize, then the changes occurring at this level provide the most insight into the potential of modernization.

One of the most important results of Phase II will be a clearer specification of the linkages which are actually being generated at the micro level. Examining farm/firm operations in detail is designed to allow clear identification and quantification of backward and forward linkages, employment and income effects, and structure of demand. In terms of backward linkages, importance is placed on not only identifying the production process at the farm level but also issues such as the specific inputs used, the mix of inputs, the extent of imported inputs, the technical coefficients, changes over time, and potential for increasing the domestically produced inputs.

For forward linkages a series of issues are important such as the extent of processing in forward linkages, domestic composition of the forward linkages, the structure of markets,

competition in markets and the value added gained by the subsector from the forward linkages. Some subsectors will have higher employment linkages than others in terms of employment requirements, new jobs created and the trade-offs between labour and capital within the subsector. The actual income multipliers which are generated by the subsector indicate the sizes of spinoffs which occur throughout the economy in terms of increased consumption.

Other effects, besides linkages, also provide insight into the variety of spinoffs generated. These include resulting improvements in within-firm operating efficiency, which are key elements of the modernization process. On a theoretical level, modernization arises from and further stimulates increased productivity and output growth through changes in technical coefficients and the mix of inputs. The results are a lower long run average cost and a more competitive firm. The changes in technical relations are one part of a process which is extremely difficult to monitor on an ongoing basis. While input-output (I-O) tables may provide information on technical relations for aggregated sectors, they provide few clues to the changes taking place within an individual subsector. Moreover, most I-O tables are out of date before they can be used. What is needed here is recurring snapshot views of recent and current technical coefficients, plus revised input mixes at the firm level to begin to allow dissection of the types of changes occurring and their impact on overall operations.

An adjunct to this is the question of whether the assumption of constant returns to scale at the firm level is appropriate for some of the modernized subsectors studied in Phase I. The sheer magnitude of some modernization efforts (as in the case of Chile) hints that increased efficiency in one subsector can provoke expansion and improved efficiency in related subsectors to which it is linked. For example, a cardboard box plant may enjoy greatly increased demand from the fruit sector so that it is able to enjoy scale economies itself and thereby decrease its prices. This could result in increasing returns to the subsector buying the boxes and provide an even more dramatic growth dynamic within the economy as a whole.

2. Industrial Organization

Phase I clearly identified organizational relationships during the modernization process as being critical for successful changes to be triggered and sustained. For Phase II, two aspects of subsector organization are important to further investigate. First, a clear identification of the relationships within the subsector must be achieved. This process requires some qualitative information on how the subsector as a whole is structured and the process by which the modernization took place. Some of the questions which must be addressed are: How many key economic actors were/are involved? Who played which roles? How important were these assignments of responsibility? What implications does this have for future advances? For example,

Phase I showed that in several cases the public and private sectors could effectively coordinate their activities to promote technological advances for a subsector.

Second, the dynamics of the interfirm relations within a subsector must be ascertained. This is to answer questions concerning degrees of competition, extent of vertical or horizontal integration, scale of firms, and concentration of ownership. Recently, a number of new trade theories have presented hypotheses regarding the effects of imperfect competition and increasing returns to scale on the application of policies within a country and the ability of firms to operate within subsectors.[1] Therefore, closer looks at issues such as degrees of competition can provide insights into the usefulness to a particular subsector of alternative policy approaches by government. These analyses also begin to address questions such as optimum size, structure of production, and role of competition in modernization.

3. Trade Environment and Fiscal Regime

All modernization efforts are affected by policy regimes both within the country and from outside. Phase I showed how these policies could support or detract from efforts at the firm and subsector level. Some useful micro-level changes worked out

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[1] For a detailed discussion of these theories see **Some Methodological Issues Concerning the Study of Successful and Unsuccessful Agricultural Sub-sectors in Developing Countries**, prepared by Keith Hay and Mary Lynch for IICA (April 1989).

despite negative macro policy environments, while others worked partly because of it. In particular, policies which impact trade (i.e. tariffs, non-tariff barriers, and real exchange rates) and fiscal expenditures (i.e. subsidies and tax rates) are important.

Both of these policy settings have direct impacts at the subsector and firm level. Output is easily distorted by inappropriate exchange rates, low taxes or high government expenditures. These distortions are sometimes made even more acute by policies such as tariffs and subsidies which attempt to compensate for policies such as overvalued exchange rates. Other policies such as exchange controls also impact the operations at the firm level. These controls have been an important factor in determining invoicing practices and financial management and viability within the firm. A more detailed look at macro indicators can provide clues to the connections between positive modernization results and key macro and sectoral policies.

4. External Market Arrangements

The issue of markets is obviously a critical one. The structure of the market is important in terms of both suppliers and buyers. If one country produces a high proportion of a particular product (say over 30% of world output on a seasonal basis) and has adequate storage facilities, it can exercise power within the market and influence prices in the short run. As more countries enter, however, each producer faces greater competition and therefore must become more price effective (in

essence facing a more elastic demand curve and being forced to move down long run average cost curves). This is seen particularly in the shrimp and dairy case studies from Phase I. There is an important range of variables to identify these conditions including: market destination; market concentration; seasonal variations; and proportion of world regional market supply.

On the buyers side, market power can also play a critical role in successful entry by a seller. If a market is controlled by a small group of brokers (as appears to be the case for Mexican vegetable sales to the U.S.), then the control which the supplier has over price and other factors is decreased. To counter this and increase net earnings from shipments, greater differentiation of agricultural products has been stressed. The approach to marketing by necessity is becoming more sophisticated and complex as evidenced in the Phase I case studies.

This added sophistication has led producers to shoulder additional costs in terms of quality control (size selection, colour, seedless/seeds, organically grown, etc) and product differentiation. Selected products sell for higher prices in foreign markets--the critical question, however, is who gets the largest share of value added generated? The more that brokers collude to control the market, the more likely they are to gain a high proportion of the value added. The balancing of costs versus achieved gains in upgrading product, improving packaging, and tightening quality controls is a key calculation in

determining expansion of the fresh (and frozen) export segment of any subsector. As this cost-gains balance shifts so may the ratio of export to domestic sales, the ratio of retail to industrial sales, and the mix of chilled, frozen, canned and other downstream process sales.

In any case, producers' increased value added may be only marginally more than with less sophisticated market targets. Indeed, expanding industrial use may yield higher net gains overall. The importance of understanding the proportion of value added received (and the ways of increasing share) is a critical question for the long run viability of many agricultural subsectors.

III. IMPLEMENTING THE APPROACH

The four areas suggested for investigation represent a cross section of new approaches to the analysis of subsectoral modernization along with some more traditional methods. A variety of instruments are included in this package which provide means to operationalize the methodological approach. These instruments are designed to provide a way to pull together a complete analysis of a subsector providing answers to the entire range of issues. How the individual case study consultants are expected to use these instruments is outlined in the final section of this report and the individual case study terms of reference.

The instruments outlined below and presented in detail in the Appendices are intended to be generic yet very detailed.

These generic versions provide the case study consultants with a overview of what issues are being addressed within Phase II and the ways to obtain answers. Obviously some sections are more appropriate for certain case studies than others. Each of the instruments need to be tailored to the structure of subsector being studied and to the priorities set for the specific case studies. This latter activity will be outlined in the individual case study terms of reference while the consultants will have to provide a framework for analysis based on the specific circumstances within the subsector in their country.

Three basic types of instruments are presented along with comments on how they can be used and what they can reveal. The three set of research tools are: calibrated flowcharts; primary data questionnaires; and secondary data sources. In Appendix #1 a summary is provided which highlights some possible objectives, methods and results from each of the issue areas. The instruments are meant to complement each other and, in a number of cases, gather similar information from a number of different sources. The overlap is intentional and is necessary to get balanced perspectives on the questions raised in the four issue areas.

1. Flowcharts

To facilitate an understanding of the issues, a series of flowcharts have been constructed which provide a generic look at

the four levels of investigation.[2] The flowcharts are not meant as definitive outlines of a particular subsector. Rather, they are intended to provide a method for identifying the critical issues which might be present in a subsector, quantifying certain relations which do exist, and understanding the dynamics which permit success or failure.

The intention is that the flowcharts will act as a tool for organizing and analyzing information gained by the consultants. Each case study should produce a different eventual "flowchart" which will represent the relations within that particular subsector. These revised flowcharts will include insights into a number of areas: the mix of inputs actually used; the technical coefficients; the proportions of domestic and foreign supply; the backward and forward linkages; and the relations with distribution channels.

Flowcharts #1 to #6 are divided by phase of the agricultural process: production preparation; growth and harvesting; post harvest market identification; post harvest retail products; shipping and final retail sales; and post harvest industrial products. The characteristics of each subsector will determine which portions of the flowcharts are appropriate and which need to be adapted. For example, the flowcharts would need little adaptation for the fruit sector. For the aquaculture industry, some conversion would be necessary (soil management would become

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[2] These flowcharts are given in Appendix 2 of this report.

pond construction and management, planting would be spawning, and so on).

Using the flowchart as a base, it is possible to do a number of things. First, the flowchart (with additions, deletions and changes) provides a method by which to more clearly lay out the process which is associated with modernization within the subsector. While it is a static view, it can be used as a way to figure out the dynamics of change. In conjunction with a flowchart on policy inputs (#7), a more specific sense of changes at the firm level consequent on modernization is possible.

Second, while the flowcharts outline the most direct layers of linkages to the agricultural activity, it is possible to trace the linkages back even further. For example, organic fertilizers are an input into the system. If the fertilizers are made domestically, then the subsector has also generated linkages back into the fertilizer production process and all of its inputs. Part of the exercise of tracing linkages is to determine which inputs are domestically supplied or imported, draw heavily on the industrial sector or the agricultural sector, differ by firm, or show high levels of substitution.

Third, by using the various flowcharts in conjunction with the farm/firm questionnaire discussed below, it is intended that revised charts can provide very specific information about relations within the subsector. Both technical coefficients and mix of inputs can be shown on the flowcharts. Here, technical coefficients are identified by unit values of input/unit value of

output, not by price and volume.

By using the flowcharts in this way they become the backbone of a quantitative and qualitative analysis of spinoffs. Not only can the process be pinpointed and the entire range of linkages established but they can also be used to quantify or calibrate the relations.

2. Questionnaires

Appendices #3, #4 and #5 provide three types of interview forms to be used for three groups of industry actors. These cover: industry associations and officials; farm and firm level operations; and product distributors such as export brokers.

a) Industry Association

Appendix #3 provides an interview guide for discussions with subsector representatives. The discussions could take place either in a group setting, individually or a combination. The intention is to use these discussions for four purposes: to get a general sense of the subsector and changes which have taken place in the past five years with modernization; to help ascertain which portions of the flowcharts are relevant for the subsector being studied; to obtain the data needed to study the degree of competition within the industry; and to gather information about the policy environment and impact of policy changes over time. The interview guide provides key items which are necessary to gain insights into these areas.

For most subsectors, finding the right people to participate in the panel discussions or corporate interviews is the key to obtaining useful results. The number of interviews or participants probably does not need to be more than 10, but the people must have a detailed knowledge of the subsector, the way it actually operates, and the changes that have occurred over time.

b) Farm/Firm Level Questionnaire

Appendix #4 provides a detailed, formal questionnaire to be administered at the farm/producer level. The questionnaire closely follows the approach of the flowcharts and acts as a vehicle to fill in many of the details needed to make the charts more closely represent the subsector. As the flowcharts require change or adaptation to the specific subsector, this questionnaire also needs to be adapted from its current generic form to fit local circumstances. As well, not all of the questionnaire is needed for each subsector. Depending on the structure of the subsector and the objectives of the specific case study, the questionnaire needs to be tailored by the consultant.

The questionnaire is intended to provide detailed information on the process at the firm and plant levels: how inputs are chosen; what markets are targeted; management styles; some of the positive and negative effects of modernization; and structure of demand. It also generates information necessary to

calculate technical coefficients and employment linkages. It is not intended, however, to provide statistically significant answers to specific questions. The value of comprehending the modernization process at the firm level is in improved understanding of the dynamics of the process, not from knowing the exact specifics of how much fertilizer was used.

Since the intention of this questionnaire is to reveal the process, the need to use large survey samples is lessened. This is important since a formal large scale survey would not only be prohibitive in cost, but would face extreme difficulties in identifying the universe of all farms/firms in a particular subsector. A form of non-random sampling should be used to select approximately 20 farms/firms for analysis. The selection should be done on the basis of what is technically called "judgment sampling". This technique bases the selection of farms on the researcher's **a priori** knowledge of the industry, the likely value of selected respondents' answers, but not on a significant sample of all participants.

The sample for the questionnaire should be based on the researcher's judgment of the variety of experiences within the subsector. Uniform cases should not be the basis of selection of those surveyed. Nor should the researchers select only cases with which they are familiar. Instead, a cross section of farms/ firms should be approached which differ by size, revenues, markets, level of modernization and efficiency. It may also be necessary to interview not only a selected number of farms but

also a number of packers or companies which control the post harvest activities.

c) **Marketing Questionnaire**

An outline of this interview form is given in Appendix #5. This is a guide for discussions with individuals involved with product marketing--particularly export marketing. These individuals may be export brokers, marketing board officials, industry representatives, multinational executives, or even packing plant managers. The objective is to construct a view of which selling channels are used, which products are successful and which otherwise, why success or failure, what changes in marketing are taking place, who is involved in these efforts and who is receiving the benefits.

3. Data

Relevant data concerning policy and subsector environment should be available at the national level and within IICA's database. These can provide additional quantitative insights into the modernization process.[3] Four types of data sets are important:

a) **Macroeconomic**

These data are available in IICA's new database and cover variables such as exchange rates, government spending, and

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[3] For specific uses and models of these data see the Hay and Lynch paper mentioned previously.

certain production figures. Manipulation of these data vis a vis the implementation of the modernization effort should provide some insights into the impacts of policies on the modernization effort.

b) Subsector Specific Data

These data may be available from national data sources (or for some subsectors such as grains from the IICA database). They provide an overview of the subsector and trends over time in its terms of trade, trade flows, market destinations, total production, number of firms, and other subsector characteristics.

c) Competitiveness Data

As mentioned in Section 2 on industrial organization, new trade theories have been developed which focus on a precise determination of the structure of a subsector and the impact that policies can have given that structure. The Cournot pricing model is particularly helpful in this regard. To use this model some basic data should be gathered on a subsector basis--namely quantity of production, price per unit produced, elasticity, marginal revenue, and marginal costs. Industry data sources may be able to supply many of these indicators to allow a simple analysis of competitiveness which can complement the information obtained from discussions with industry representatives.

d) Multiplier Analysis

A distinction has been made in this document between linkages and multipliers. The linkages refer to the direct expansion of activities in backward and forward linked

industries, and to increased employment and expanded income generated within the subsector. Multiplier effects refer to the "second and subsequent round" impacts which are generated from this increased activity. How does this expansion of income spread throughout the economy? To answer this question requires analysis based on three multiplier factors: marginal propensity to consume; marginal propensity to import; and marginal propensity to save. Information should be available at the national level on these marginal propensities which can be used in conjunction with the subsector specific information (such as increases in exports) to generate a rough estimate of the macro ripple effects of expanded activities throughout the economy (including any net impacts on foreign trade or domestic industries, income, savings or consumption).

IV. SELECTION OF CASES

Phase I was based on eight case studies of modernization: grains in Argentina; soy beans in Brazil; fruit in Chile; vegetables in Mexico; dairy in Costa Rica; poultry in Peru; flowers in Columbia; and shrimp in Ecuador. This spectrum of cases provided valuable insights into the five factors influencing the modernization process and covered both export and domestic production.

The depth of analysis necessary to gain specific insights into linkages for Phase II necessitated the narrowing of the number of case study countries to focus the available resources.

The selection of cases for Phase II was based on the methodology presented in this document. While all eight cases would provide valuable information on linkages, some cases presented opportunities to gain more insights into specific issues.

Appendix #6 presents a matrix which highlights the cases and their applicability to various issues. The specific definitions of linkages and efficiency are important to note since they correspond to the way in which the terms are used in this document.

It was decided not to include Brazil for a number of reasons. Soybeans will be part of the analysis in Argentina and the similarities between the cases allow conclusions to be drawn for both cases. Grains and soybeans are both commodities which mean that while they generate many forward linkages, the value added generated is primarily outside the subsector. Finally, the role of government marketing boards is much higher in Brazil than Argentina and therefore the industrial organization and marketing aspects are less private sector oriented.

In terms of the Columbia flower sector, both forward and backward linkages are limited and therefore would yield limited results. The Peru poultry case has positive implications for income effects, but has a degree of subsidization and heavy import requirements that make indepth investigation less interesting.

As a result, five case studies are chosen: Argentina; Chile; Mexico; Costa Rica; and Ecuador. Even though Brazil, Columbia and

Peru are not specifically being included in Phase II, it is hoped that any relevant references and conclusions from Phase I will be incorporated in the overall Phase II analysis.

V. OUTPUTS OF CASE STUDIES

The outputs required from the case study consultants will vary by country. Within each of the issue areas, there are some questions which all the cases will address, while others will be more relevant for specific subsectors. The particular outputs are listed in supplementary documents being sent to the case study consultants. These documents outline which parts of the methodology are most important and what the specific expectations are for fulfilment of the contract.

APPENDIX 1

SUMMARY OF METHODOLOGY

SUMMARY OF METHODOLOGY

OBJECTIVE	METHOD	WHAT
Micro Issues		
* Subsector flowchart	Preliminary discussions with farm personnel	* Determine appropriateness of chart
* Process by farm	Farm questionnaire	* Flowchart applicability by farm
* Backward & Forward Linkages	Farm questionnaire Industry questionaire National data	
a) choice of inputs		* selection * substitution * cost considerations * investment decisions * rent or buy * alternatives * import/domestic * role of research & development * technological change
b) Technical Coefficients		* value of inputs per unit value of output
* Employment Linkages	Farm questionnaire National data	* employment by type * types of jobs (skilled & unskilled)
* Efficiency	Farm questionnaire Industry questionnaire National data	* improved long run average cost in subsector and input industries
* Multiplier	Farm Questionnaire National Data	* second round effects of increased income generation
* Product Markets	Farm questionnaire	* final demand (% of market to consumers, producers, etc.) * industry linkages * export/domestic * arrangements & costs * prices for goods
* Service Related	Farm questionnaire	* financial & other services * taxes, incentives, subsidies

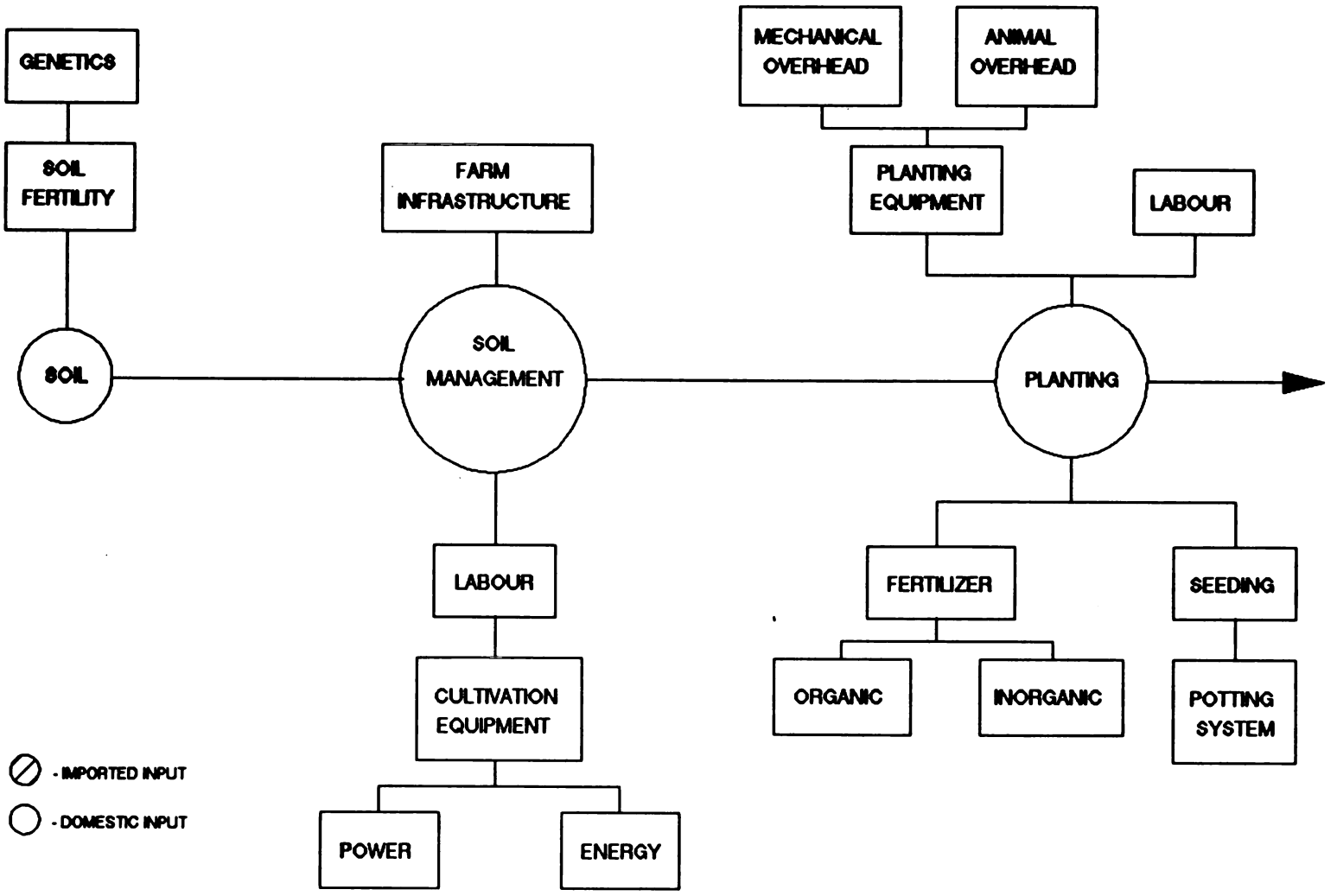
OBJECTIVE	METHOD	WHAT
Micro Issues (con't)		
* +/- effects	Farm questionnaire	* changes in infrastructure & services * training * environmental effects * working conditions
Industry Organization		
* Structure of Subsector	National Data Industry questionnaire	* number of firms * number of plants * distribution * concentration of ownership & market share * entry & exit * competition * organization of production & distribution * vertical/horizontal * role & coordination of public & private sectors * marketing boards * multinational corporations
* Measure competitiveness of subsector (Cournot pricing model)	National data Farm questionnaire Industry questionnaire	* units of production * price per unit * elasticity * marginal revenue * marginal cost
* Structure of Production	Industry questionnaire	* increasing returns to scale * markup pricing * technical change * profit rates * exports/imports * capital & labour intensity
* Long run strategy	Industry questionnaire	* what future plans * what changes needed * weaknesses/strengths * policy changes

OBJECTIVE	METHOD	WHAT
Trade & Macroeconomic Trends		
* Assess Trade & Fiscal Environment	IICA's database National data Questionnaires	* nominal official exchange rates * real exchange rates * grey market exchange rates * tariff rates * government expenditures * tax rates * subsidies * price regulations * credit * non-tariff barriers (i.e. health standards) * export channels * import licencing
External Marketing Arrangements		
* Market Character	National data Flowchart Questionnaires	* market destination * market concentration * seasonal variation * proportion of world regional supply
* Dynamics/logistics	"	* actors involved marketing boards brokers wholesalers multinational enterprises large supermarket chains public/private mix export promotion
* Differentiation & value added	"	* differentiated products * number of brokers per market * quality control measures * cost of additional quality control * changes to value added share * role of multinational corporations

APPENDIX 2

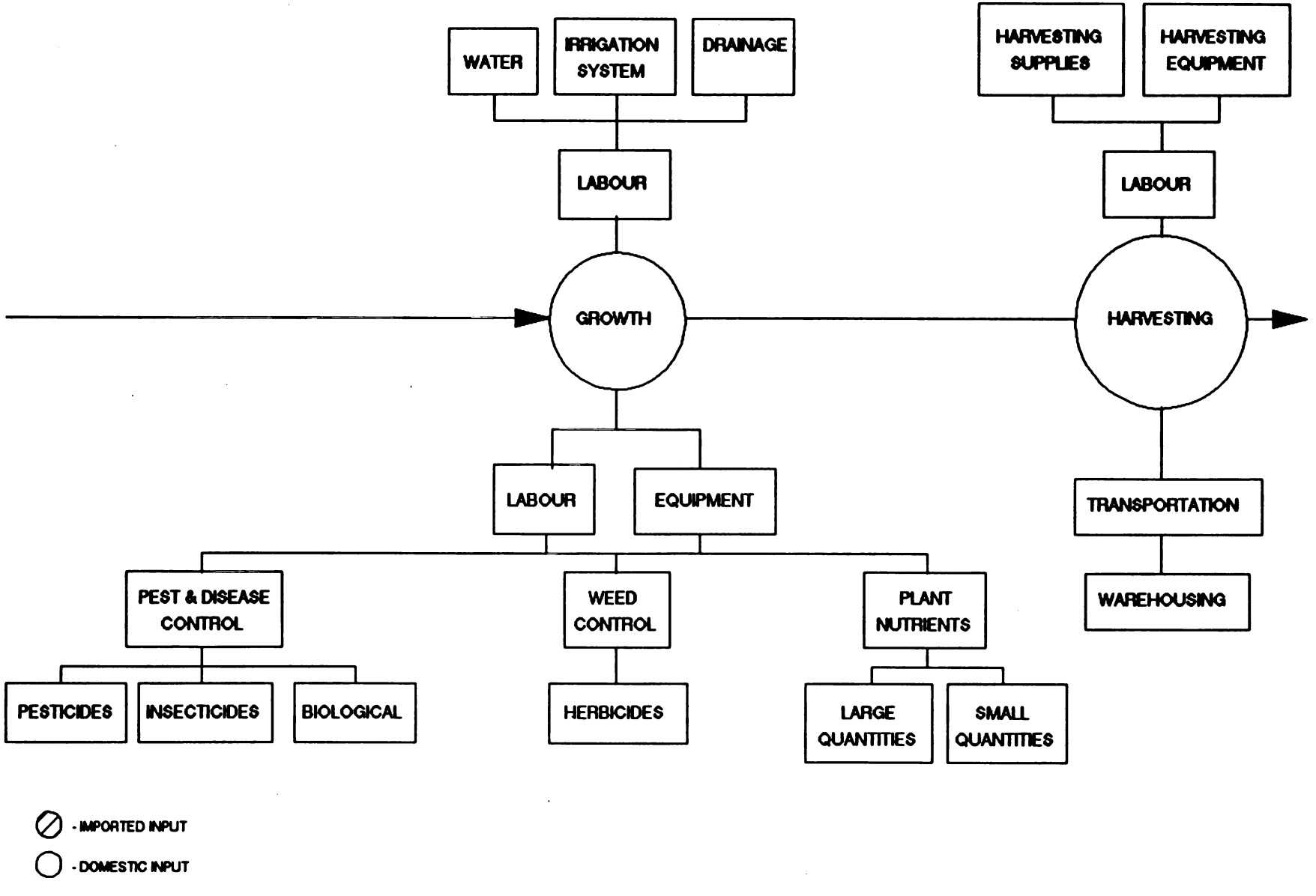
FLOWCHARTS

FLOWCHART 1
PHASE I - PRODUCTION PREPARATION



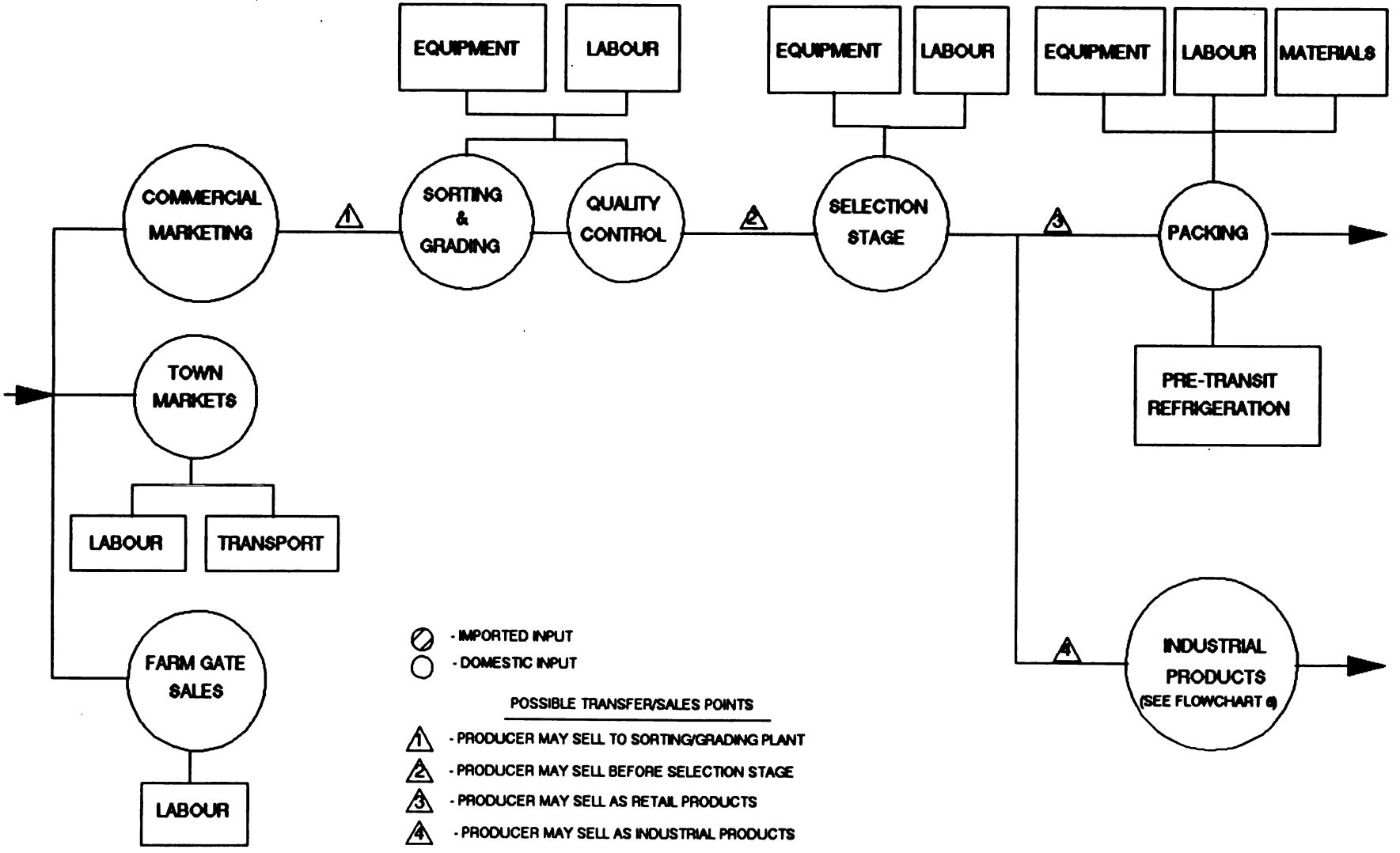
FLOWCHART 2

PHASE I - PRODUCTION: GROWTH & HARVESTING



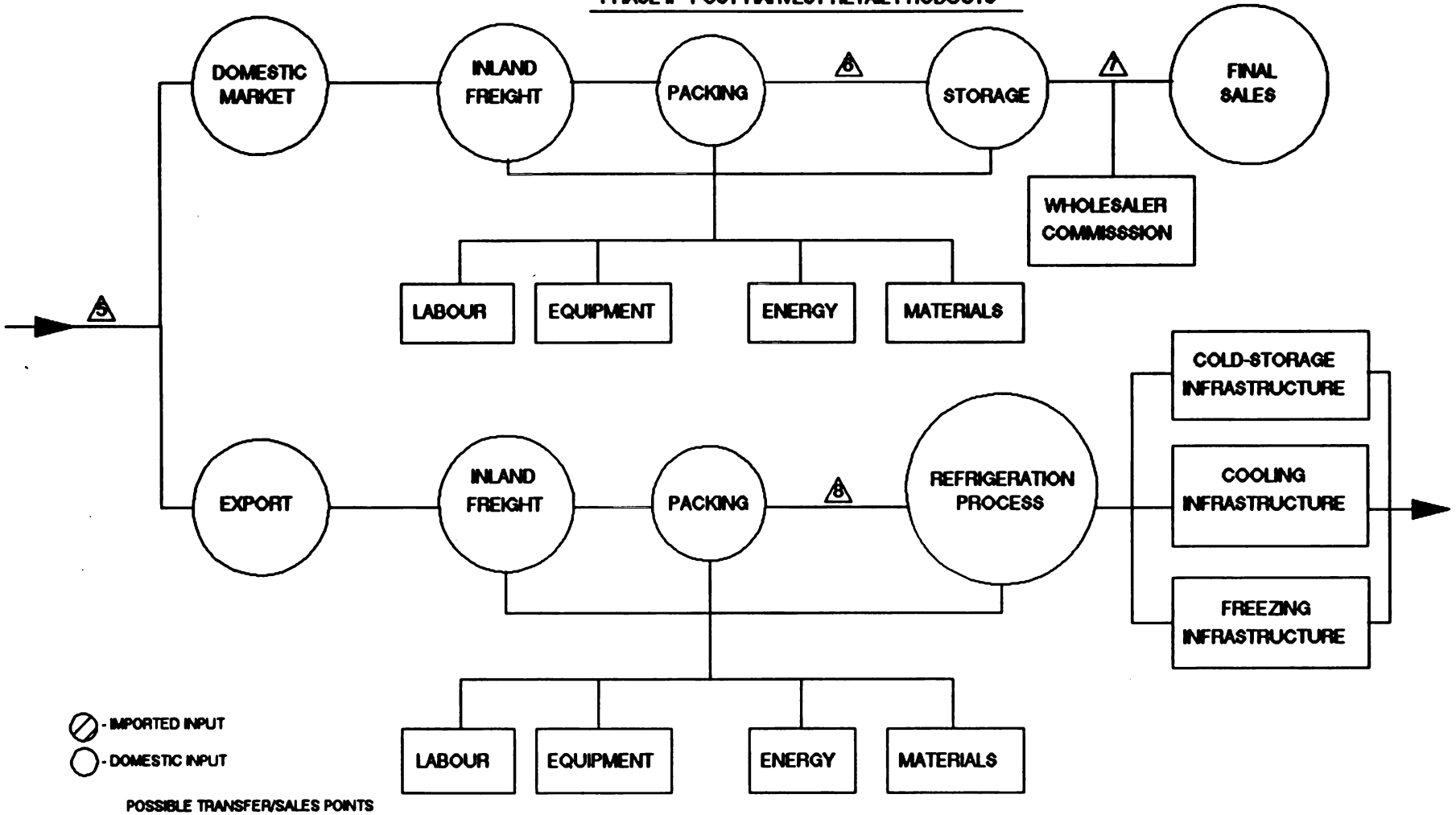
FLOWCHART 3

PHASE II - POST-HARVEST: MARKET IDENTIFICATION



FLOWCHART 4

PHASE II - POST-HARVEST RETAIL PRODUCTS



⊘ - IMPORTED INPUT

○ - DOMESTIC INPUT

POSSIBLE TRANSFER/SALES POINTS

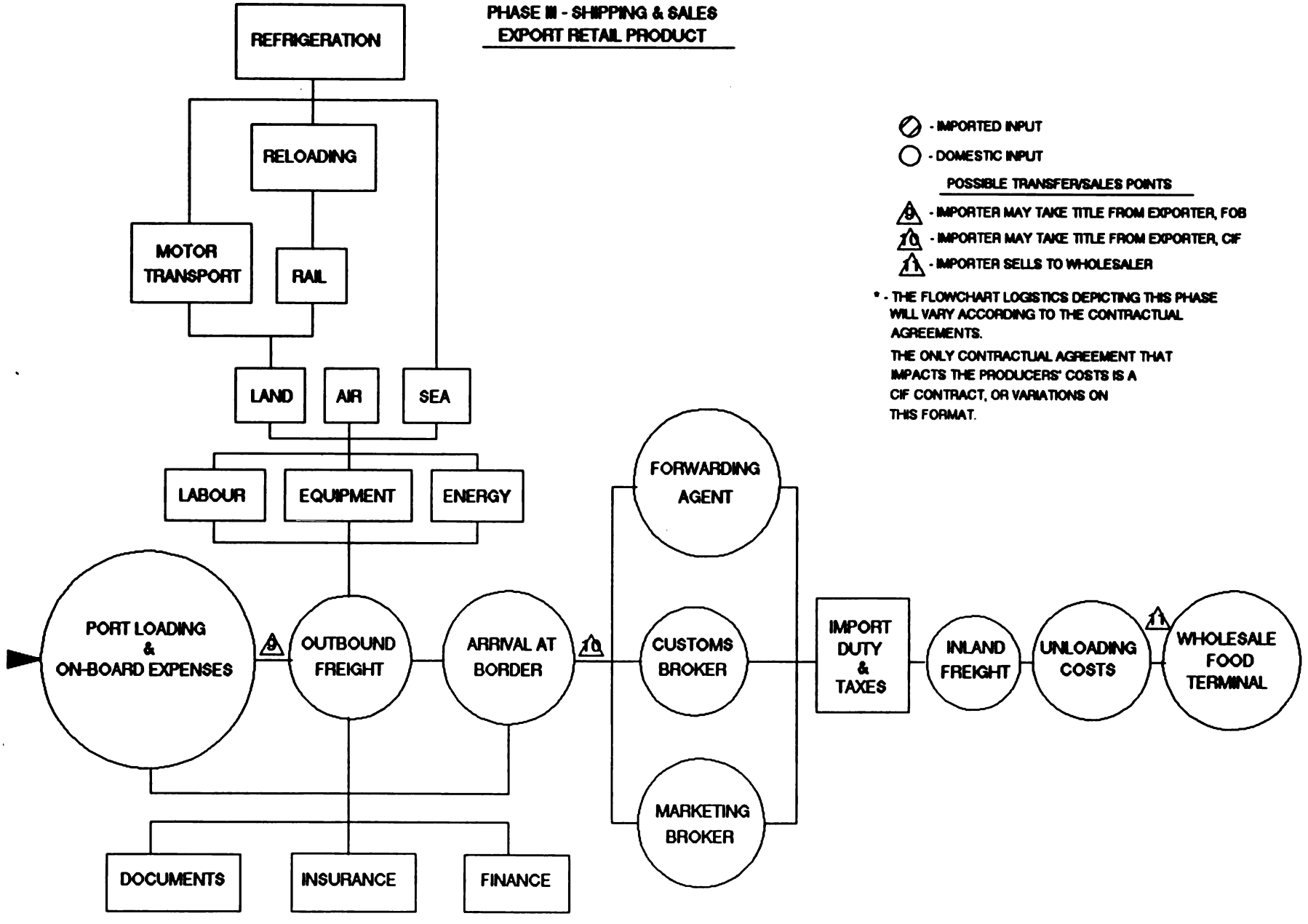
5 - PRODUCER MAY HAVE TO SELL THROUGH MARKETING BOARD, OR TO VERTICALLY INTEGRATED CORPORATION

6 - PURCHASE BY CHAIN STORE OR RETAIL COOPERATIVE

7 - WHOLESALER COLLECTS COMMISSION

8 - PRODUCER MAY SELL TO MULTINATIONAL ENTERPRISE, OR DOMESTIC EXPORT COMPANY

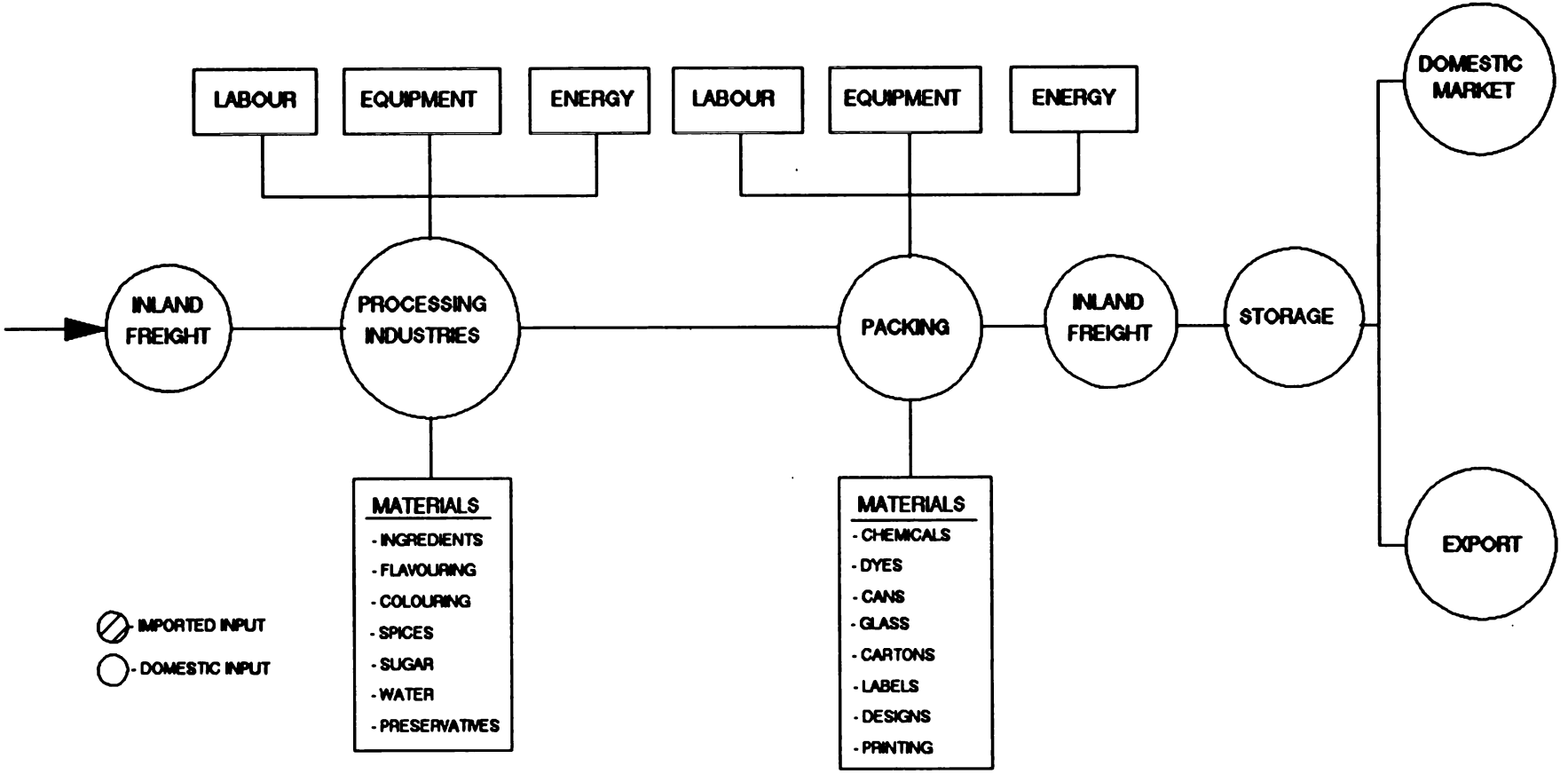
FLOWCHART 5
PHASE III - SHIPPING & SALES
EXPORT RETAIL PRODUCT



* - THE FLOWCHART LOGISTICS DEPICTING THIS PHASE WILL VARY ACCORDING TO THE CONTRACTUAL AGREEMENTS.

THE ONLY CONTRACTUAL AGREEMENT THAT IMPACTS THE PRODUCERS' COSTS IS A CIF CONTRACT, OR VARIATIONS ON THIS FORMAT.

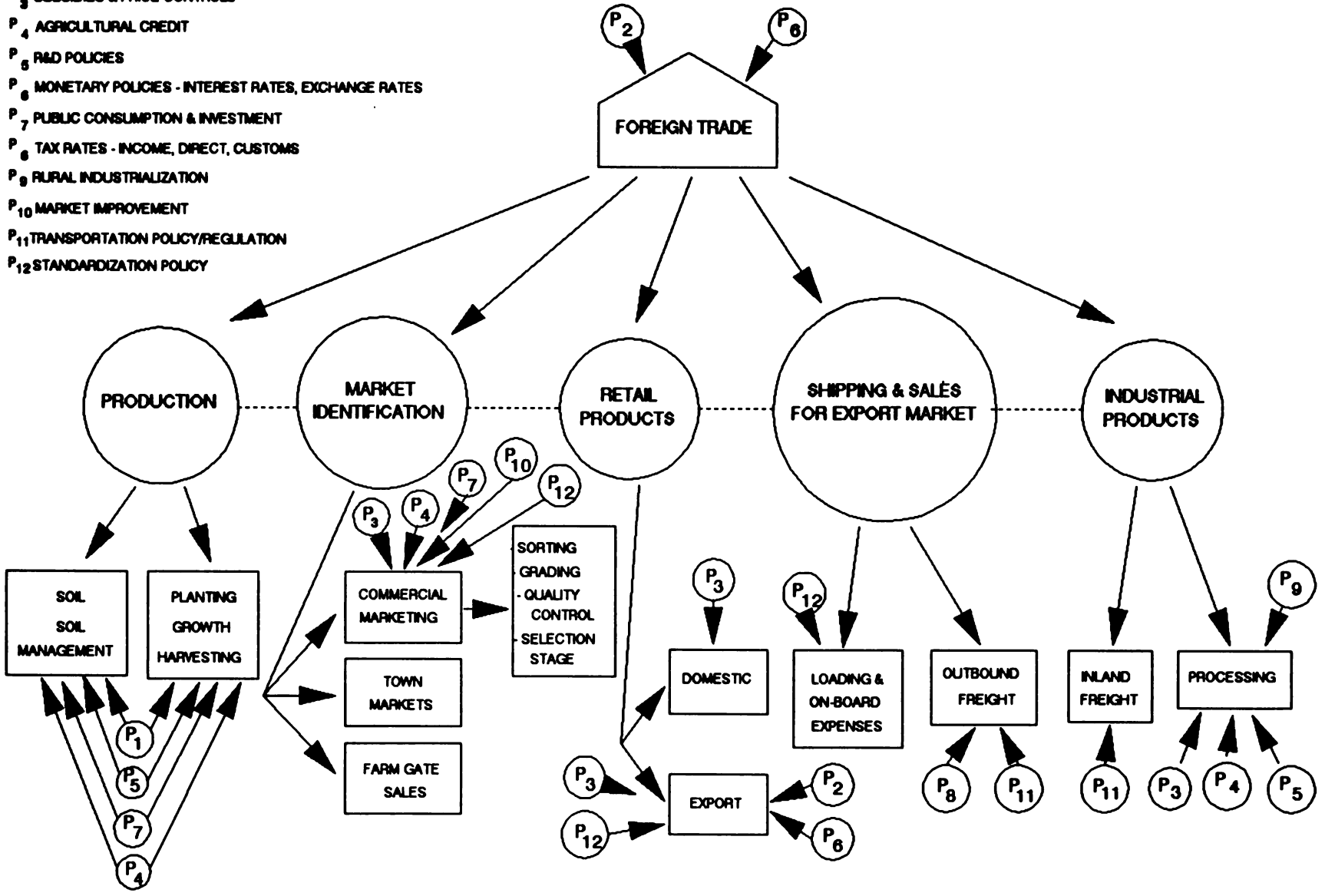
FLOWCHART 6
PHASE II - POST-HARVEST: INDUSTRIAL PRODUCTS



POLICY INPUTS

POLICY INSTRUMENTS - GOVERNMENT

- P_1 LAND, WATER, INFRASTRUCTURE POLICIES &/OR PROVISIONS
- P_2 IMPORT/EXPORT CONTROLS & SUBSIDIES
- P_3 SUBSIDIES & PRICE CONTROLS
- P_4 AGRICULTURAL CREDIT
- P_5 R&D POLICIES
- P_6 MONETARY POLICIES - INTEREST RATES, EXCHANGE RATES
- P_7 PUBLIC CONSUMPTION & INVESTMENT
- P_8 TAX RATES - INCOME, DIRECT, CUSTOMS
- P_9 RURAL INDUSTRIALIZATION
- P_{10} MARKET IMPROVEMENT
- P_{11} TRANSPORTATION POLICY/REGULATION
- P_{12} STANDARDIZATION POLICY



APPENDIX 3

FARM LEVEL QUESTIONNAIRE

PRELIMINARY FARM LEVEL QUESTIONNAIRE

FIRM DATA

Name of Firm/Individual Running Farm: _____

Address: _____

_____

Telephone Number: _____

Name and Position of Respondent(s): _____

_____

Principal products of the farm:

	Product	Proportion of Output (%)
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____

PROFILE

1. In what year did operations start? _____

2. Is the farm owned by?

a) ___ an individual/family
b) ___ partnership
c) ___ corporation (domestic)
d) ___ corporation (foreign)
e) ___ other (specify) _____

3. Is the farm operated by the owner? ____ Yes ___ No

If no, who operates the farm?
a) ___ contractor
b) ___ tenant
c) ___ cooperative
d) ___ manager
e) ___ other (specify) _____

4. What is the hectarage of the farm? _____

RESEARCH AND DEVELOPMENT

5. Has research and development played an important role on your farm? ____ yes ___ no

If yes, has it improved?

___ the variety of products produced
___ the quality of products produced
___ the variety of inputs used
___ the quality of inputs used
___ other (specify) _____

6. Who undertook the R & D?

___ in house (within the firm)
___ a government agency
___ a private company
___ research centres
___ a university/college/technical school
___ a cooperative organization
___ other (specify) _____

If more than one group, what was the division of responsibility?

_____

_____

7. Do you feel that technological innovations have had a significant impact on the productivity of the farm over the last five years?

____ yes ____ no

If yes, which technological changes played the greatest role in improving productivity? (Please rank)

____ genetics/new seed varieties
____ seed enhancement
____ fertilizer enhancement
____ other (specify) _____

8. In terms of increasing productivity of the farm, which factors have had the most impact over the last five years? (Please rank)

____ technological innovations
____ increased mechanization
____ improved labour productivity
____ training
____ management systems
____ increases in wage scales
____ provision of non-monetary incentives
____ other (specify) _____

SOIL MANAGEMENT & PLANTING

9. Have soil management methods changed significantly on this farm over the last five years?

___ yes ___ no

If yes, how have they changed? _____
_____

to what do you attribute the change? _____
_____

10. Have you had problems with soil erosion in recent years?

___ yes ___ no

If yes, is erosion due to:

___ drought
___ excess water
___ wind
___ salt
___ lack of crop rotation
___ high dependency on chemical fertilizer
___ other (specify) ____
_____

11. Do you rotate crops or use other methods of soil maintenance?

___ crop rotation
___ other (specify) _____

a) **Equipment**

12. Has the farm placed priority on mechanizing planting?
___ yes ___ no

13. In preparing the soil for planting, do you use mechanized equipment, animal drawn equipment or both?

___ mechanized
___ animal drawn equipment
___ both

If both, what is the proportion (%) of the work done by each?

___% machines
___% animal drawn equipment

14. What equipment is used in preparing the land for planting?

_____

_____

15. Has this changed in the past five years? ___ yes ___ no

If yes, How? _____

16. Have you bought or leased new machines in the last five years? ___ yes ___ no

If yes, which machines have you bought or leased in the past five years? Please list.

1. _____
2. _____
3. _____
4. _____

17. What were the most important factors in determining the equipment used?

_____ original acquisition price
_____ cost of operating new equipment
_____ availability of new machinery
_____ breakdown of old machinery
_____ high cost of operating and maintenance on old machinery
_____ the ability to service & find parts for old machinery
_____ substitution away from labour
_____ efficiency of equipment
_____ other (specify) _____

18. What percentage of your machinery was bought new? ____%

19. What proportion of this new machinery would be imported? ____%

20. Who do you use to service the machinery?

_____ own workers
_____ yourself
_____ service contract with outside company
_____ independent service people
_____ supplier of equipment
_____ other (specify) _____

21. What proportion (%) of acquisition costs is spent on service each year? ____%

22. Do you have problems currently accessing spare parts?

_____ yes _____ no

If yes, why? _____

23. In general do you buy your spare parts from?

_____ local suppliers
_____ domestic suppliers
_____ foreign suppliers

24. What proportion of the spare parts that you use are actually made abroad? _____%

25. Do you use only family members to operate machinery?
___ yes ___ no

If yes, what members? _____

26. How do you train workers to operate the machinery?

____ hired experienced workers
____ on the job training
____ train them yourself
____ use supervisors
____ other (specify) _____

27. For animal drawn equipment, have any changes been made in the last five years in terms of either techniques or actual equipment used? ___ yes ___ no

If yes, what changes? _____
_____

28. Where do you get your fodder/feed for draft animals?

____ grow it yourself
____ local suppliers
____ domestic suppliers
____ foreign suppliers

29. What proportion of the feed would be imported? _____

30. What proportion of total operating costs would be spent on maintaining machinery? ____%
maintaining animals ____%

b) **Labour**

31. Over the last five years, has the labour intensity on your farm

___ increased
___ decreased
___ remained the same

32. Do you hire seasonal workers to undertake the planting?

___ yes ___ no

If yes, are these migrant workers skilled? ___ yes ___ no

What skills in particular?

	Skills	Proportion of Workers	Male or Female
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____

33. How many full time workers do you have? _____
part time _____
seasonal (for planting) _____

34. What proportion of your total workers would be women? ____%

35. Is there a high turnover in your labour force?

___ yes ___ no

If yes, what do you think causes this situation? _____

_____

36. How important is skill level at the planting stage?

___ very important
___ important
___ not very important
___ not at all important

37. Do you have different levels of payment for skilled and unskilled workers?

___ yes ___ no

If yes, what is the ration of skilled to unskilled pay?

_____:_____

38. How many managers do you employ? _____

What is the ratio of their pay to unskilled workers?

_____:_____

39. Is the preharvest/planting stage management of the farm contracted out? ____ yes ___ no

If yes, what proportion of total labour cost is this? _____%

40. What proportion of total operating costs would be spent on labour for planting? ____%

c) **Fertilizer**

41. Of all the fertilizer used on the farm, what proportion is inorganic? ____%

42. Have you increased the use of inorganic fertilizers over the last five years?

___ yes ___ no

If yes, by what percent annual growth in use? _____%

What proportion has this increased your production?

____% over five years
____% per year

43. What factors influence your decision about inorganic versus organic fertilizers?

___ price differences (how much cheaper are inorganic? __%)
___ quantities needed
___ production impact (how much can be production be increased ____%)
___ availability
___ reliability of supply
___ technological breakthroughs
___ other (specify) _____

44. Where do you buy inorganic fertilizer?

___ local supplier
___ domestic supplier
___ foreign supplier

45. What type of inorganic fertilizer is used?

___ straight fertilizers (such as potassium, magnesium)
___ fertilizer mixtures (two or more straight fertilizers)
___ compound fertilizers
___ foliar fertilizers (completely water soluble)

46. What proportion of the inorganic fertilizers you use is imported? ___%

47. Where do you get your organic fertilizer?

___ own livestock or crop residue
___ local farmers
___ local suppliers
___ cooperatives
___ other (specify) _____

48. What proportion of your operating costs do you spend on

organic fertilizers ____%
inorganic fertilizers ____%

d) **Planting/Seeding**

49. Do you grow your own seedlings or buy them?

___ grow own
___ buy
___ both, what proportion is bought? _____%

50. If you grow you own, do you have greenhouse facilities?

___ yes ___ no

If yes, what type? _____

51. What growing media is used in the potting system for growing the seedlings?

___ soil/sand
___ peat moss
___ compost (local ingredients such as saw dust or animal manure
___ other (specify) _____

52. How are the seeds sown?

___ by hand
___ by machine
___ combination
___ other (specify) _____

53. What type of containers are the seedlings developed in?

___ manufactured paper pots
___ plastic pots/bags
___ other (specify) _____

What proportion of these would be imported? ____%

54. What type of containers are used to transport the seedlings?

___ plastic trays
___ wooden boxes
___ cardboard boxes
___ other (specify) _____

What proportion of these containers are made domestically?
_____%

55. How are the seedlings transported to the planting sites?

Method	Proportion
___ truck	____%
___ tractor	____%
___ labourers by hand	____%
___ other (specify) _____	

56. Are the seedlings planted by

Method	Proportion
___ hand	____%
___ machine	____%
___ tools	____%
___ other (specify) _____	

57. Have any new techniques for seedling development or planting been used in the last five years?

___ yes ___ no

If yes, what are the new techniques? _____

_____

How much have these changes improved output? ___%

58. What proportion of your operating costs do you spend on growing or purchasing seedlings? ____%

GROWTH STAGE

a) **Water**

59. Do you have any problems with water supply? ____ yes ___ no

If yes, describe problems:

___ seasonal shortage
___ chronic shortage
___ water polluted
___ other (specify) _____

60. Do you use an irrigation system? ___ yes ___ no

If yes, what type of system do you have:

___ furrow irrigation
___ sprinkler system
___ drip irrigation (with plastic tubing)
___ other (specify) _____

61. Have you made any major changes to your irrigation system in the last five years? ___ yes ___ no

If yes, what types of changes and why? _____

_____

62. What proportion of your operating costs would you spend on water and irrigation systems? ____ %

b) **Pest & Disease Control**

63. Which of the following techniques are used to control pests & disease? (rank in order of importance)

___ biological control (using enemies of pests)
___ farm management techniques
___ crop rotation
___ use of resistant species
___ pesticides
___ insecticides

64. How much flexibility do you have in choosing between these pest control techniques?

___ None
___ Little
___ Some
___ Total Flexibility (inputs can be easily substituted)

65. What are the main factors which guide your decision about pest control techniques? (Rank in order of importance)

___ availability of materials
___ price
___ knowledge of products
___ reliability
___ quality
___ tradition
___ tariff or import restrictions
___ other government regulations
___ other (specify) _____

66. Have technological advances changed your pest control techniques in the last five years? ___ yes ___ no

If yes, what are the most significant changes? _____

_____

67. For the pesticides and insecticides, do you normally get your supplies through:

___ local supplier
___ domestic supplier
___ foreign supplier
___ other (specify) _____

68. What proportion of the pesticides and insecticides do you estimate to be imported? ___%

69. What proportion of your total operating costs do you spend on pest control? ___%

c) **Weed Control**

70. Which of the following techniques are used to control weeds? (Rank in order of importance)

___ mechanical (using portable rotary slasher, etc.)
___ manual (pulling, hoeing, slashing, etc.)
___ herbicides
___ other (specify) _____

71. Why is the primary method identified above for weed control used over other techniques? (Rank in order of importance)

___ effectiveness in general
___ effectiveness for specific plants
___ equipment availability
___ price
___ labour availability
___ climatic conditions
___ environmental effects
___ Other (specify) _____

72. Have significant changes been made in the last five years in terms of types of weed control methods used? ___ yes ___ no

If yes, what are these changes? _____

_____

73. If herbicides are used, where are they obtained?

___ local supplier
___ domestic supplier
___ foreign supplier
___ cooperatives
___ other (specify) _____

74. What proportion of the herbicides used are imported? ___%

75. What proportion of the total operating costs are attributed to weed control? ___%

d) **Plant nutrients**

76. Do you test the soil for nutrient balance? ___ yes ___ no

77. Do you need to use plant nutrients to improve your growth rates? ___ yes ___ no

78. What nutrients do you use most? (Rank in order of importance)

___ nitrogen
___ phosphorous
___ potassium
___ sulphur
___ calcium
___ magnesium
___ iron
___ manganese
___ boron
___ zinc
___ copper
___ other (specify) _____

79. Who supplies your plant nutrients?

___ local manufacturer
___ local supplier
___ domestic supplier
___ foreign supplier
___ cooperative
___ other (specify) _____

80. What proportion of your operating budget do you spend on plant nutrients? ____%

HARVESTING

81. Have your harvesting techniques changed in the last five years? ___ yes ___ no

If yes, how? _____

_____

a) **Equipment**

82. What types of equipment are used in harvesting your product? (List)
1. _____
2. _____
3. _____
4. _____
5. _____

83. Why are these specific types used? (Rank in order of importance)

___ available on farm
___ most appropriate for product
___ price
___ layout of farm
___ other (specify) _____

84. Do you own or rent the equipment?

___ own
___ rent
___ both, proportion rented ____%

85. What proportion of your harvesting machinery was bought new?
____%

86. Who services your harvesting equipment?

___ yourself
___ own workers
___ service contract with outside company
___ independent service people
___ supplier of equipment
___ other (specify) _____

87. Do you have problems currently accessing spare parts?

___ yes ___ no

If yes, what are they? _____

_____

b) **Labour**

88. Is the harvesting done mechanically or manually both?

___ mechanically
___ manually
___ both, what proportion manually ____%

89. Why are these methods used? (Rank in order of importance)

___ better quality control
___ less damage to the product
___ cheaper technique
___ most convenient
___ other (specify) _____

90. Do you hire migrant workers to harvest your crops?
___yes ___ no

91. Are these workers skilled? ___ yes ___ no

If yes, what proportion are skilled? ___%

If yes, where do these workers get their training?

___ on the job
___ through training offered by your farm
___ through training offered by the industry
___ through experience
___ other (specify) _____

92. What system of supervision or overseeing is used to ensure high quality control of harvested crops?

_____

_____

93. What proportion of total operating costs is attributable to workers harvesting? ___%

c) **Transportation**

94. What form of transportation is used to carry the produce from the field to the grading facility?

___ trucks
___ tractors and wagons
___ workers
___ other (specify) _____

95. What kind of containers are used to transport the produce?

___ cardboard boxes
___ wooden boxes
___ plastic containers
___ string bundles
___ other (specify) _____

96. What is the average time between the product being picked and its arrival at the grading facility? _____ minutes/hours

97. What proportion of your operating costs would you attribute to transporting the product from field to packing facility?
____%

MARKET IDENTIFICATION

98. What proportion of your products do you sell to:

___% farm gate
___% in local village markets
___% domestic consumer markets
___% export consumer markets
___% as inputs into domestic processing industry
___% as inputs into foreign processing industry

99. Have these proportions changed significantly over the last five years? ___ yes ___ no

If yes, what were the proportions five years ago?

____% farm gate
____% in local village markets
____% domestic consumer markets
____% export consumer markets
____% as inputs into domestic processing industry
____% as inputs into foreign processing industry

100. Are you satisfied with this market distribution? ___ yes ___ no

If not, which market(s) would you like to expand?

___ local markets
___ domestic consumer markets
___ export consumer markets
___ as inputs into domestic processing industry
___ as inputs into foreign processing industry

101. Which of those markets take the highest quality items? (Rank with #1 being highest)

1. _____
2. _____
3. _____
4. _____
5. _____

102. Which of these markets makes the best earnings (unit value) for you?

1. _____
2. _____
3. _____
4. _____
5. _____

103. What determines the proportion sold to each market? (Rank in order of importance)

___ earnings potential in each market
___ markets specifically targeted
___ the condition, quality or size of the product
___ the demand generated in each market
___ world market conditions
___ buyers requirements
___ foreign government regulations
___ domestic government policies
___ marketing board policies
___ non-tariff barriers
___ other (specify) _____

104. Are different procedures (from planting to harvesting) undertaken for sales to different markets or are all products handled the same until the post harvest period?

___ different procedures
___ same procedures
___ other (specify) _____

105. How does the market impact when the products are harvested?

___ no impact
___ little impact
___ harvest based on maximizing consumer acceptance
___ other (specify) _____

106. Is separation of products for different markets done initially at the

___ harvest stage
___ quality control stage
___ grading stage
___ packing stage
___ other (specify) _____

107. Are your products packaged to target particular markets?

___ yes ___ no

If yes, how and where? _____

_____

QUALITY CONTROL

108. After the product is harvested, are initial quality control tests undertaken on selected products?

___ yes ___ no

If yes, please describe _____

_____

109. Is the selection of these products by quality and grading done on the farm or are all post harvest activities done off-farm?

___ on-farm
___ off-farm
___ both

If both, please specify the responsibilities undertaken in both areas. _____

_____

110. If off-farm, are the grading facilities operated by

___ your firm
___ a cooperative
___ a private domestic company
___ a multinational enterprise
___ a government agency
___ other (specify) _____

111. Why do you use your current arrangement for grading?
___ most efficient
___ cheapest
___ suits size of farm
___ suits volume of output
___ convenience
___ other (specify) _____

112. Is the initial selection of produce for packing done by

___ machine
___ workers
___ combination, what proportion ___%

Explain _____

113. How are the grading standards set?

___ by government regulation
___ by requirements of buyers
___ by an agreed industry standard
___ by machinery restrictions
___ other (specify) _____

114. Is the grading done

___ mechanically
___ by hand
___ both, what proportion by hand? ___%

If both, please explain _____

115. What proportion of your grading machines were bought new?
___%

116. Was the machinery adapted to meet your specific needs?

___ yes ___ no

If yes, how? _____

_____

117. Do you modify the equipment on an ongoing basis?

___ yes ___ no

If yes, why?

___ to make it more productive
___ to respond to changes in market requirements
___ to increase the level of differentiated product
___ to satisfy industry/government standards
___ to increase/decrease labour requirements
___ other (specify) _____

118. What proportion of your machines were made domestically?
____%

119. Who services your grading machinery?

___ yourself
___ on-staff workers
___ service contract with outside company
___ independent service people
___ supplier of equipment
___ other (specify) _____

120. Do you have problems obtaining spare parts? ___ yes ___ no

If yes, why?
___ not available
___ too expensive
___ long time delay
___ machinery too old
___ import restrictions
___ foreign exchange restrictions
___ other (specify) _____

121. How many workers do you have involved in the grading and quality control process? ___

122. Are a majority of the workers full time? ___ yes ___ no

123. What proportion of the workers are women? ____%

124. Does the labour force fluctuate by season? __ yes ___ no

125. What proportion of your operating costs goes toward grading the products in preparation for packing? ____%

PACKING

126. Are your products packed in-house or sent to specialized packing plants?

___ in-house
___ specialized packing plants
___ both, what proportion in-house? ____%
___ other (specify) _____

If both, what determines which method is used?

___ the market targeted
___ the products
___ the season
___ cost
___ volume variations
___ other (specify) _____

127. Is the packing technique standardized for all destinations or does it vary?

___ standard
___ varies by destination, how _____?
___ varies by product, how _____?
___ other (specify) _____

128. Are the packing materials standardized or do they vary?

___ standardized
___ vary by destination, how _____?
___ vary by product, how _____?
___ other (specify) _____

129. What types of packing materials are used? _____

_____

_____

130. Is the packing done by machine, hand or both?

___ machine
___ hand
___ both, what proportion by hand? ___%

If both, what is the division of work? _____

_____

131. What proportion of the machinery did you buy new? ___%

132. Is the machinery adapted on an ongoing basis?

___ yes ___ no

If yes, why?

___ to make it more productive
___ to respond to changes in market requirements
___ to increase the level of differentiated product
___ to increase/decrease labour requirements
___ other (specify) _____

133. What proportion of the machines were made domestically?
___%

134. Who services your packing machinery?

___ yourself
___ on staff workers
___ service contract with outside company
___ independent service people
___ supplier of equipment
___ other (specify) _____

135. How many workers would you employ packing the products?

_____

136. Are a majority of these workers full time, part time or seasonal?

___% full time
___% part time
___% seasonal

137. What proportion of the packers are women? ____%

138. What proportion of your operating costs do you spend on packing the product? ___%

139. What proportion of your products do you ship immediately after packing? _____%

140. For the portion which is not shipped immediately what type of cooling and storage do you have? _____

_____

141. Do you own these cooling and storage facilities? ___ yes ___no

If no, who owns them?

___ cooperative
___ private domestic company
___ multinational enterprise
___ marketing board
___ other (specify) _____

142. What proportion of your operating costs goes toward cooling and storage? ____%

DISTRIBUTION

143. What percentage of the distribution is channelled by the following distributors?

___% wholesalers
___% brokers
___% direct to buyers
___% marketing boards
___% producer cooperatives
___% other (specify) _____

144. Do the distribution channels change with the market targeted? ___ yes ___ no

If yes, explain _____

_____

145. How do you decide the selling price of your goods?

___ operating costs plus mark-up
___ set by commodity market
___ set by brokers
___ set by government
___ other (specify) _____

146. Please rank the following items in terms of their importance in making pricing decisions (0 = not applicable; 1 = not important; 2 = somewhat important; 3 = important; 4 = very important)

To maintain market share	0	1	2	3	4
To cover operating costs	0	1	2	3	4
To compete with domestic producers	0	1	2	3	4
To satisfy price controls	0	1	2	3	4
To face import competition to match world (US) prices	0	1	2	3	4
Other important factors (specify) _____	0	1	2	3	4

147. Are your goods sold cif? ___ yes ___ no

If no, what is the basis? _____

148. Do you have problems shipping your goods? ___ yes ___ no

If yes, what are they? _____

_____

SERVICES & INCENTIVES

149. How do you finance the costs of inputs during the planting and pre harvest phase? (Give proportions of each method)

___% from cash reserves
___% suppliers credit
___% firm who owns farm
___% bank loan
___% cooperative loan
___% government credit programs
___% informal sector (family, friends or money lenders)
___% other (specify) _____

150. How do you finance capital investment?

___ reinvested profits
___ private bank
___ development banks
___ government bank
___ cooperative funds
___ informal sources (family, friends or money lenders)
___ other (specify) _____

151. What are your sources of financing working capital?

___ cash reserves
___ private bank
___ government bank
___ cooperative
___ informal sources
___ other (specify) _____

152. Did financial constraints pose a problem in your efforts to modernize? ___ yes ___ no

153. What are your costs of borrowing money:

	For short term	For long term
0-8%	____	____
9-15%	____	____
16-25%	____	____
26-40%	____	____
40-60%	____	____
over 60%	____	____

154. What return do you aim to make on your investment in this crop? (Rank)

0-5%	____
6-10%	____
11-15%	____
16-20%	____
21-30%	____
over 30%	____

Did you achieve this target

in 1986 ___ yes ___ no
in 1988 ___ yes ___ no

155. What proportion of your operating costs would you expend on other services such as accounting, legal or financial planning? ____%

156. Do you use any government programs? ___ yes ___ no

If yes, which programs? _____

_____

157. Do you receive any government incentives or subsidies?

___ yes ___ no

If yes, which ones? _____

_____

TECHNICAL COEFFICIENTS

	1988	1986
TOTAL VALUE OF OUTPUTS	_____	_____
VALUE OF VARIOUS INPUTS (OPERATING)		
a) Research & Development	_____	_____
b) Equipment Operating & Maintenance Total	_____	_____
By Phase:		
Soil management & planting	_____	_____
Growth	_____	_____
Harvesting	_____	_____
Sorting and Grading	_____	_____
Selection	_____	_____
Packing	_____	_____
Domestic Market preparation	_____	_____
Export Market preparation	_____	_____
c) Labour Total	_____	_____
By Phase:		
Soil management & planting	_____	_____
Growth	_____	_____
Harvesting	_____	_____
Sorting and Grading	_____	_____
Selection	_____	_____
Packing	_____	_____
Domestic Market preparation	_____	_____
Export Market preparation	_____	_____

d) Materials

Organic Fertilizers	_____	_____
Inorganic Fertilizers	_____	_____
Potting Systems/Seedlings	_____	_____
Pest Control	_____	_____
Weed Control	_____	_____
Plant Nutrients	_____	_____
Water	_____	_____
Irrigation Systems	_____	_____
Drainage	_____	_____
Harvesting supplies	_____	_____
Warehousing	_____	_____
Packing materials	_____	_____
Pre-transit refrigeration	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

e) Transportation

Total	_____	_____

By Phase:

Harvesting	_____	_____
Local markets	_____	_____
Domestic markets	_____	_____
Export markets	_____	_____

APPENDIX 4

INDUSTRY LEVEL QUESTIONNAIRE

GUIDELINES FOR DISCUSSIONS WITH INDUSTRY REPRESENTATIVES

OVERVIEW

Does the subsector primarily export, sell to processing industries, or the domestic market? What would you estimate to be the proportions of each market?

What are the principal products of the subsector and how much are they processed? (fresh, frozen, canned, etc.)

Have there been dramatic changes in the markets and products in the last decade? How does this translate into shifts in proportion of market share? product share?

Has there been a large increase in production? To what is it attributed?

How flexible or elastic are the markets for your products?

Has the industry begun to differentiate its products to target more specific markets?

Have you diversified your product lines and markets? How concentrated are your markets?

How do you get information about markets, market trends, etc.? How much flexibility do you have in responding to shifts in products? quality? timing?

What role do you play in selling overseas? Who helps you with overseas sales? What is the role of government in this? What are the main problems in exporting?

OWNERSHIP

Is the ownership concentrated?

Are there a large number of firms? How are the firms defined by product type and stage of production? Is there distribution of firms which sees many small firms, a few large firms and few in between?

Is the industry controlled by a small number of firms?

What is the mix of ownership by domestic, foreign and public sector firms? have these proportions changed over the last five years? What is the role of multinational corporations?

GEOGRAPHICAL CONSIDERATIONS

Is the activity of the subsector concentrated geographically? Are there reasons for why it is or is not concentrated? Is a specific type of soil required for successful production?

COMPETITION

Is there a high level of competition between firms?

Do domestic firms face competition from imports?

Do the domestic firms face a high level of competition on international markets?

Is it easy or difficult to enter the subsector? why?

Is it easy or difficult to leave the subsector? why?

Have there been moves towards vertical or horizontal integration as a way to increase competitiveness?

GOVERNMENT

Does the government set standards or are they set by the industry?

What support role does the Government play for this subsector?

Does the Government coordinate its efforts with the private sector?

Is there competition between firms for government support programs?

What role do marketing boards play?

What has been the intention of government programs vis a vis your subsector? In what ways have these programs succeeded or failed?

What has been the impact of policy changes over time?

STRUCTURE OF PRODUCTION

What is the relationship between firms operating in the subsector and the farms producing the product? Are the farms owned by the firms or are they independent?

How much of the production process is controlled at the farm level?

Does the farm decide on what will be grown, the types of varieties to be grown, market destinations?

Does the farm handle post harvest activities such as packing, grading, etc. or are these handled by separate operations?

Are economies of scale important for the subsector? Are gains being made in terms of improved efficiency of your inputs as well as your own production?

FIRM DECISION MAKING

Who decides how, when, and what type of new growing techniques, new machinery and new methods will be incorporated into the production process?

How do you decide the type of labourers (migratory, skilled, unskilled) to use at different levels of operation?

How much flexibility is there in the capital and labour mix?

On what basis is pricing of products done?

Has profitability of the subsector increased in recent years? What implications does this have for the individuals and firms moving into (and out of) the subsector?

FUTURE PLANS

What are the long term prospects for the subsector? What changes are needed to reach maximum potential?

What are the current strengths and weaknesses of the subsector?

What are the key policy changes required (either within the country or from other countries) which would enhance future prospects for the subsector?

APPENDIX 5

MARKETING QUESTIONNAIRE

GUIDELINES FOR DISCUSSIONS WITH MARKETING REPRESENTATIVES

OVERVIEW

How have the various markets for this product changed in recent years? Retail domestic market? Retail export market? Industrial domestic market? Industrial export market?

Have markets become more or less concentrated geographically?

How has the product range changed in recent years in terms of fresh, frozen and canned products? Subproducts? Industrial products?

Have prices for these products been relatively stable?
If not, what causes fluctuation in prices?

Has demand for the product fluctuated? What has triggered these fluctuations?

Are there an increased number of producers domestically? internationally?

RELATIONS WITHIN MARKETPLACE

How does the marketing of this product work? How does it change for the market targetted?

What role do brokers, wholesalers, multinarional enterprises, large supermarket chains etc. play in distribution?

Do producers coordinate their efforts? If so, how and why?

Are a limited number of brokers operating within the market domestically? internationally?

Does the public sector take an active role in marketing?

How does information about market tastes and trends get passed back to the producers? Can producers accurately match production with requirements of the market such as timing and quality?

What are inventory controls and storage availability like in the industry?

Are particular export markets more concentrated in terms of buyers?

Is there a high degree of competition between producers within the country?

DIFFERENTIATED PRODUCTS

Have producers begun to increase their differentiation of products to increase their market share or profits?
What sort of changes have been made?

What consequences does this have for increased quality control (such as size, colour, freshness, brand names, labelling, packaging methods, etc)? What consequences does this have for increased cost of the product?

Have domestic producers begun to use international or brand names to increase their sales?

Are differentiated products handled differently in terms of the distributors used or the number of distributors available in a particular market?

PRICES

Who sets prices within the industry?

How are brokerage or marketing fees set?

Do producers receive a proportionally higher price for their differentiated products? What are the incentives to produce better quality products? How big are the price differentials?

Do multinational corporations have any impact on prices received by the producer? the broker?

APPENDIX 6

CASE STUDY COMPARISON MATRIX

CASE STUDY LINKAGES: COMPARATIVE ADVANTAGES

	MICRO LEVEL				INDUSTRIAL STRUCTURE	EXTERNAL MARKETING	TRADE
	BACKWARD LINKAGES [1]	FORWARD LINKAGES [2]	EMPLOYMENT LINKAGES [3]	EFFICIENCY [4] & SPIN-OFFS	COMPETITION	DIFFERENTIATION OF PRODUCTS	COMPETITIVENESS IN WORLD MARKETS
*ARGENTINA	HIGH	HIGH, BUT GAIN LOW VALUE ADDED ON SALES TO INDUSTRIAL	LOW	ALL GAINS BASED ON CHANGING TECHNICAL COEFFICIENTS & INPUT MIX	SUB-CONTRACTORS OF SMALL & MEDIUM GROUPS	LITTLE	HIGH
BRAZIL	HIGH	HIGH, BUT GAIN LOW VALUE ADDED ON SALES	LOW	GAINS BASED ON TECHNICAL COEFFICIENTS & INPUT MIX	INCREASING CONCENTRATION DUE TO REGIONAL SHIFT	LITTLE	HIGH
*CHILE	HIGH	HIGH	HIGH MIGRANTS & PROCESSING	HIGH	HIGH BUT COORDINATED	HIGH	HIGH
*MEXICO	HIGH	POTENTIALLY HIGH	HIGH MIGRANTS	HIGH	MNCs POWER CONCENTRATED	HIGH	HIGH
*COSTA RICA	MEDIUM	POTENTIALLY HIGH	MEDIUM	HARD TO ASSESS WITH SUBSIDIZED FOREIGN COMPETITORS	VERTICAL INTEGRATION HIGH ENTRY COSTS	HIGH	COMPETITIVE IN LIMITED MARKET
PERU	LIMITED - PRIMARILY IMPORTS	FEW	LOW	HARD TO ASSESS WITH SUBSIDIZED INPUTS	ENTREPRENEURS AS OWNERS	LITTLE	NOT COMPETITIVE
COLOMBIA	LIMITED	FEW	HIGH AT CUTTING STAGE	MARGINAL	ENTREPRENEURS AS OWNERS	MEDIUM	HIGH
*ECUADOR	MEDIUM	HIGH SINCE SPECTRUM OF PRODUCTS/PROCESSES	MEDIUM	HIGH PRODUCTIVITY HIGHER THAN WORLD AVERAGE (POND FARMING)	VERTICAL INTEGRATION	HIGH	HIGH

1 WIDE RANGE OF INPUTS IS HIGH

2 FORWARD LINKAGES MEAN A SPECTRUM OF UPSTREAM USES FROM WHICH THE PRODUCER CAN GAIN INCREASED VALUE ADDED

* CASE STUDY/COUNTRY SELECTION - PHASE II.

3 LABOUR INTENSITY OF PROCESS

4 IMPROVEMENTS IN BOTH EFFICIENCY OF SUBSECTOR (BOTH TECHNICAL IMPROVEMENTS & DECREASED LONG RUN AVERAGE COST) & EFFICIENCY OF INPUTS

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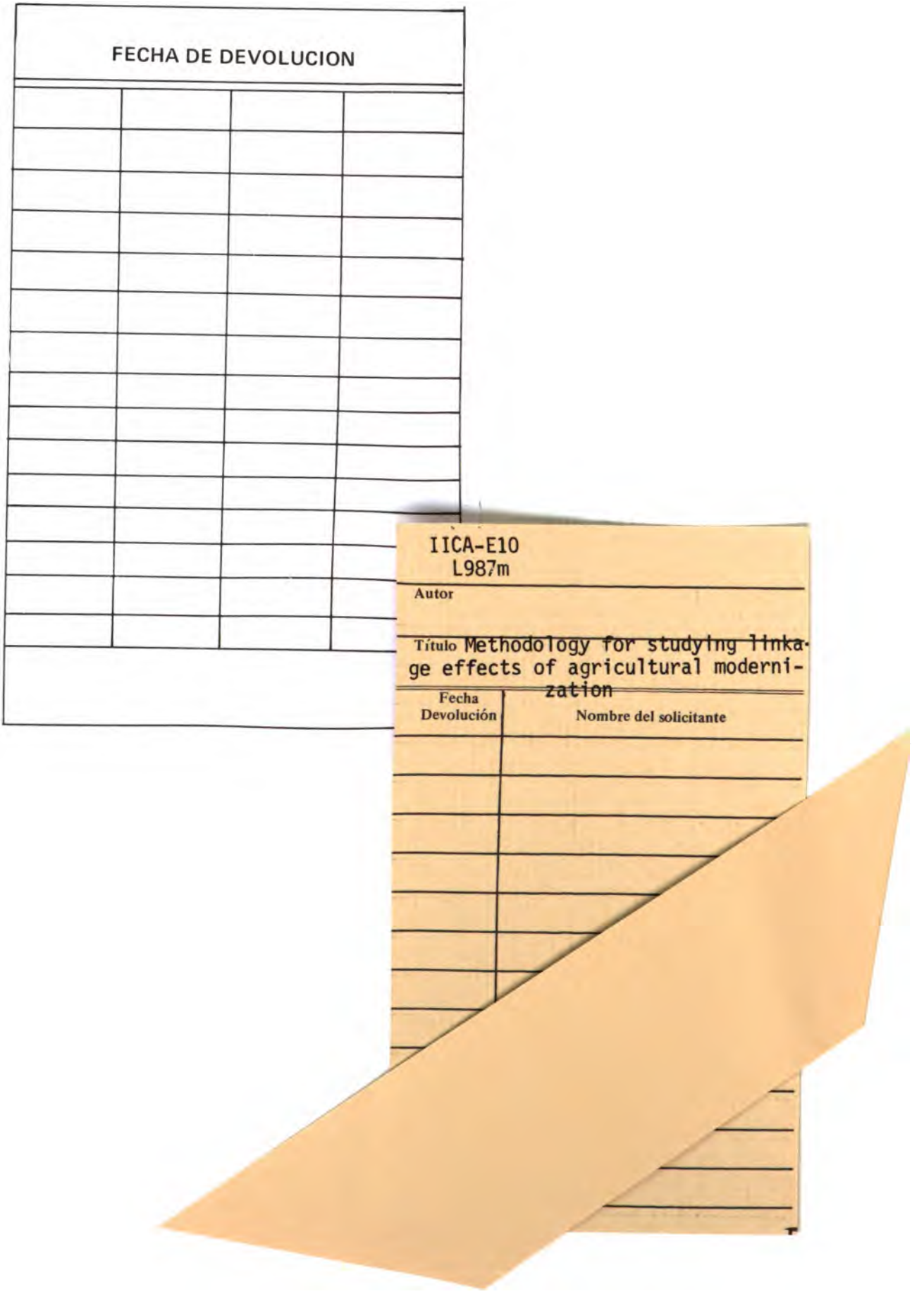
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