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MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

Directorate of Economics

Research Paper Series

THE IMPACT OF ALTERNATIVE AGRO- INDUSTRIAL INVESTMENTS ON POVERTY REDUCTION IN RURAL MOZAMBIQUE

by

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THE IMPACT OF ALTERNATIVE AGRO-INDUSTRIAL INVESTMENTS ON POVERTY REDUCTION IN RURAL MOZAMBIQUE

Research Report - Phase I

1. INTRODUCTION AND BACKGROUND

Over two thirds of the Mozambican population live below the poverty line. Absolute poverty is more accentuated in rural areas where about 80% of the country's population live and work - poverty levels in these areas reach about 71%. Urban and peri-urban poverty levels are also alarming - about 62% (MPF/UEM/IFPRI, 1998). Most of the people in rural and peri-urban areas draw their incomes from agriculture and non-farm rural based activities that are strongly linked to agriculture.

The Government's Action Plan for the Reduction of Absolute Poverty (GOM, 2001) recognizes, in very general terms, the role that agro-industrial investments can play in reducing rural poverty levels in the country. Little attention, however, has been given to developing specific strategies to enhance the impact of these investments on rural poverty in a consistent and sustainable manner. In general, the potential and the necessity for agro-industrialization is clear. There are, however, many questions regarding how to get the right kind of agro-industrialization - the sort that stimulates employment, reduces poverty and real food prices, stimulates real wages, improves food safety and protects the environment. Furthermore, there has been a tendency in Mozambique, as elsewhere, to separate research on competitiveness and business development from that on poverty alleviation (Reardon and Barret, 2000).

Research throughout the developing world has shown a potentially strong relationship between agro-industrial investments and growth in smallholder agriculture and poverty reduction (Jaffee and Morton, 1995; Dorward, Kydd, and Poulton, 1998; Delgado, 1999). We suggest in this paper that agro-industrial investments, if properly structured to relate to smallholder producers, can play a very important role in rural poverty reduction strategies in Mozambique. Current agro-industrial investments in the country demonstrate various degrees of connectedness with rural households. The choice of how, and how closely, to relate to smallholders is determined by the characteristics of the commodity, by the physical, political, and economic environment in which the investment takes place, and by the knowledge, skills, experience, and preferences of the smallholders and of the investors and company management. Given the breadth of factors involved, different approaches can emerge under apparently very similar circumstances, each with differing implications for rural poverty reduction. Therefore, knowledge of the likely effects of alternative investment options in the food and fiber industries on rural incomes and firm profits becomes an important asset in the design of rural poverty reduction strategies.

This research is organized in two phases. Phase I - Reconnaissance Study - is the object of this report. Phase II will consist of more in-depth research to develop specific policy advice on how to enhance the impact of agro-industrial investments on rural poverty reduction.

The route for this paper is as follows. Section II introduces the objectives of the study and the field research approach. A review of growth linkage concepts and their relation to poverty reduction is presented in section III. Section IV discusses issues on the organization of rural production and trade using transaction costs economics principles. A discussion of the

reconnaissance study results following the field work and making use of the concepts introduced in previous sections is presented in section V. Section VI closes the paper with the summary of key conclusions, policy implications and suggestions for further research.

2. OBJECTIVES AND FIELD RESEARCH APPROACH

2.1. Objectives of the Study

The general objective of this study is to explore policy options aimed at strengthening the relationship between agro-industrial investments and the smallholder farm sector, in order to increase the impacts of those investments on poverty reduction in rural Mozambique.

Specific objectives in Phase I are:

- To provide a brief overview of the types of agro-industrial investments currently existing and planned in Mozambique;
- To develop an initial assessment of the likely effects of these investments on rural poverty reduction;

Specific outputs in Phase I include:

- Create a typology of agro-industrial investments with respect to their connectedness (relationship and level of support) to the smallholder sector, emphasizing the likely strength of production/marketing and employment linkages in each type;
- Develop an inventory of current and planned agro-industrial investments in Mozambique, and place each of them within the typology. Include any available information regarding investment incentives that the firms received;
- On the basis of this inventory, provide an initial assessment of the relative level of poverty reduction that these investments may effect, and the key mechanisms through which they will achieve this;
- Briefly discuss ways in which the poverty reduction impact of the investments might be increased.

2.2. Field Research Approach in Phase I

The field research activities in Phase I included the establishment and a review of an investment database on rural investments, and site visits around the country.

2.2.1. Mozambique's Rural Based Investments Database

This effort consisted of constructing an agriculture and agro-industry investment data set based on information collected on projects approved by the Center for Investment Promotion (CPI) between 1985 and 2001. The database includes newly established projects as well as rehabilitation and expansion projects. The SPSS data set includes the following variables properly coded and labeled:

- Project name
- Location: Province and District
- Type: new, rehabilitation, expansion
- Object/sector/nature

- Type of link to the smallholder sector
- Outputs produced
- Crops involved
- Direct employment generated
- Market orientation: domestic versus export
- Value of investment by source: foreign direct, domestic direct and other

Over 300 rural based investments in agriculture, forestry, livestock and agro-industry are included in the database. The overview presented in Section 5 makes use of this information.

2.2.2. Contacts with Institutions and Agro-Industries in Selected Sites

Throughout the course of phase I, various institutions from Government, Donors, NGOs and private sector were interviewed regarding their support to smallholders, agro-industry, or both. Information about the current government incentives to investment in the country was collected - a detailed list is included in the Annex 2 of this report.

Some selected investment sites were also visited in three provinces: Nampula in the north, Sofala and Manica in the central part of the country, and Maputo in the south. A complete list of individuals contacted and their affiliation is included in Annex 1. During these site visits, we explored in some detail:

- The nature of the current relationships between the companies and the smallholder sector;
- The types of assistance, if any, those agro-industries receive from government or donors to invest. How important has that assistance been in the decision to invest and in the success of those investments?
- Discussion on alternative institutional arrangements and policies aimed at strengthening links between companies and the smallholder sector.

3. GROWTH LINKAGES AND RURAL POVERTY REDUCTION

The analysis of the impact of alternative agro-industrial investments on rural poverty reduction assumes that if properly structured to relate to the smallholder sector, those investments can play an important role in reducing rural poverty in the current stage of Mozambique's economic development. An important set of questions to answer in this context includes: How much extra net income is generated by increases in farm income in rural areas as a result of those arrangements? How are those gains accrued by the different income groups?

Poverty reduction from agro-industrial investments can come from direct, or first-round effects, if the investment contributes to increased farm income of poor farmers or if it employs them in processing or other activities. Indirect, or second round effects on poverty are driven primarily by the way in which this initial increase in income is re-spent. Agricultural Economists and other development specialists have historically analyzed these direct and indirect effects using the concept of growth linkages, and have quantified the effects by calculating growth multipliers. There are five types of intra-sectoral linkages, two in the factor markets (capital and labor) and three in the product markets (backward production, forward production and consumption linkages). Although some reference is made to factor market linkages, we will focus primarily on linkages in the product markets. This section is intended to define those types of linkages, and present evidence of their size in Sub-Saharan Africa - through previous research that estimated growth multipliers. The ultimate objective is to link the issue of growth linkages to rural poverty reduction.

3.1. Backward Linkages from Agriculture to Rural Input Suppliers

Backward linkages from agriculture to rural input suppliers refer to the supply of production inputs by rural enterprises to agricultural producers. Examples of non-farm activities that supply inputs to farming activities include blacksmithing, metalworking and repair, fertilizer production, and cement and building materials businesses. The type and magnitude of these linkages depend on the prevalent agricultural technology, size of holdings, type of crop and whether production is irrigated or rainfed (Haggblade, Hazell, and Brown, 1989). Research in Sub-Saharan Africa (SSA) has found the size of those linkages to be considerably smaller than what is found in Asia. Limited use of fertilizer, agricultural equipment and irrigation in Sub-Saharan Africa determines this low order of magnitude.

3.2. Forward Linkages from Agriculture to Processors and Distributors

Forward linkages from agriculture to processors and distributors refer to the connection of agriculture with non-farm activities that demand crop production for direct marketing or processing purposes. These linkages are said to be about ten times more important than backward linkages in SSA (Haggblade, Hazell, and Brown, 1989). Among forward linkages in SSA, links with food processing have been identified as the most important, followed by distribution of agricultural products. By focusing exclusively on micro and small scale rural enterprises, many of the studies undertaken in the region have hidden the role of larger scale processing activities that take place predominantly in rural areas or are at least linked to those areas. This study will focus initially on those larger-scale agro-industrial investments and their

forward linkages as a key source of the first round of income effects which can lead to significant poverty reduction.

3.3. Consumption Linkages

Consumption linkages are related to the consumer demand change that results from increasing farm incomes in a dynamic economy. Consumption linkages have a potential to be an important stimulant to the growth of the rural non-farm economy. As rural per capita incomes rise, the demand for local services, manufactured goods, and higher quality and semi-processed foods typically increase more rapidly than the demand for non-processed foods. Evidence from SSA suggests that the production of these commodities and services is labor intensive, which leads income in those sectors to grow quite rapidly. High population density and adequate transport facilities to make rural services accessible to the villages are key determinants of these growth patterns. Since SSA has generally low population densities and poor transport infrastructure, it is generally hypothesized that as incomes grow demand will shift less rapidly away from foods in SSA than in South Asia. The few household expenditure studies that allow assessment African rural consumption linkages support the hypothesis that African spending patterns support far less rural non-farm activity than do those in South Asia.

The contribution of the different income groups to rural economic growth through consumption linkages depends on their consumption patterns. Evidence has suggested that there is a relationship between income levels and spending patterns - poorer households tend to spend more of their additional incomes in local non-tradables (Haggblade, Hazell, and Brown, 1987, Haggblade, Hazell, and Brown, 1989; and Delgado, Kydd, and Poulton, 1998). Therefore, first round income accruing to lower income households will generate larger growth multiplier effects.

3.4. The Size of Growth Linkages

The size of growth linkages is estimated using growth multiplier models (Hazell, 1984; Rogers, 1986; Haggblade, Hazell, and Brown, 1987; and Delgado, Kydd, and Poulton, 1998). Most models allow for the breakdown of the total multiplier into its production and consumption based components. Initial studies using the base multiplier model in the 80's found an average multiplier of about 1.82 for South Asia - indicating that an initial \$1 increase in farm income produces an additional \$0.82 in total rural income - but relatively small effects in SSA, ranging from 1.27 in Mauritania (Rodgers, 1986) to 1.5 in Nigeria and Sierra Leone (Haggblade, Hazell, and Brown, 1987). More recently Delgado, Kydd, and Poulton, (1998) have found that, under a specific set of circumstances, the potential for additional demand-led growth in rural Africa is likely to be much higher than previously thought. They find multipliers that range from 1.96 in Niger, 2.48 in the Central Groundnut Basin of Senegal, 2.57 in Zambia, and 2.88 in Bourkina Faso. The specif set of circumstances (exhibited to varying degrees in those study regions) are:

- Increments in incomes are spent largely on goods and services produced locally;
- The local goods and services demanded do not have substitutes that can be imported at low cost; and
- Availability of unused productive resources that can be drawn into production to produce goods and services demanded with the additional incomes.

Most research results have shown that, under conditions prevailing in Sub-Saharan Africa, consumption linkages account for over 80% of the agricultural growth multiplier (as compared to 60% in South Asia). It is suggested that this does not arise because consumption linkages are more powerful in Africa than in South Asia (the marginal budget share for non-farm goods is smaller in Africa), but instead, because of the weaker inter-industry linkages in Africa.

In this report we make use of these concepts to the extent possible. Estimating the impact of first round income rises under alternative institutional arrangements between agro-industries and smallholders, and the likely linkage effects for different income groups is part of what this study is aiming at in its second phase.

4. TRANSACTION COSTS AND THE ORGANIZATION OF RURAL PRODUCTION AND TRADE

This section uses transaction costs economics to analyze the choice of institutional arrangements between agro-industries and smallholder farmers. First, it defines the most important types of institutional arrangements in the case of Mozambique. Second, the factors hypothesized to affect transaction costs, and the effects of these costs on choice of institutional arrangement, are presented and discussed from a theoretical perspective. The basic assumption in this section is that any arrangement must ensure acceptable profits for processors and traders while satisfying smallholder needs for increased incomes and food security. If either condition is not satisfied, organizational arrangements are not likely to be sustainable. Equity considerations are introduced in the final part of the section, to evaluate the conditions under which the various organizational forms can promote growth with equity.

4.1. Alternative Institutional Arrangements Between Farmers and Processors

In Sub-Saharan Africa, there is a plethora of different institutional arrangements governing the relationship between production, trade, and processing (Delgado, 1999). In Mozambique, those forms can be summarized in three different types defined on the basis of the degree of vertical coordination between farmers, traders, and processors: Spot market trading, contract farming and plantation agriculture. One form that does not necessarily fit into that continuum but interacts to a great extent in the dynamics of the markets is also described - cooperatives/rural associations.

4.1.1. Spot Market Trading - Processing/trading with Independent Producers (IP)

This arrangement includes agro-industries that rely primarily on independent smallholders for the supply of raw material for processing, without any contracting arrangements. These firms and smallholders have strictly a marketing relationship. Under this arrangement, each of the participating parties make independent decisions based on its own conditions, preferences and the information available on preferences and behavior of others (Jaffee and Morton, 1995).

Under ideal conditions, there are several advantages of this form of organization over more elaborate organizational ties (Williamson 1985). Unlike some alternative institutional arrangements, where most behavioral constraints need to be negotiated and monitored and therefore cannot be quickly or easily changed, relationships governed by spot market transactions offer great flexibility to respond quickly to changes in market conditions, as it is generally easier to negotiate adjustments in price levels than to agree and implement changes in trading rules. Also, factor prices generate budgetary constraints, while output prices limit purchasing options. Lastly, in a competitive environment, this type of arrangement provides economies in information as market prices “summarize” the information that trading parties require to interact efficiently (Jaffee and Morton, 1995). Therefore, in areas where transaction costs in processing and marketing of crops are low and there are various forms of institutional development that support service provision, or where factor and product markets operate efficiently, this is probably the most desirable form of organization (Delgado, 1999). Examples of these type currently existing in Mozambique include, among others, cashew, maize, and mango sub-sectors.

In much of SSA, however, transactions costs are high, factor markets (especially for inputs and credit) often fail, and service provision is poor. Under these circumstances, reliance on spot market transactions can trap smallholders in Schultz's "efficient but poor" conundrum, and leave processors with insufficient and unreliable supplies of poor quality product. The impact of this type of arrangement on poverty alleviation, therefore, can be considered highly vulnerable to changing market conditions. Unlike the other types, this arrangement is likely to be spread over larger geographical areas, with a larger number of different actors with differing degrees of market power, all of which makes it difficult for either smallholders or processors to capture significant benefits. This means that the direct, or first round effects of this type of arrangement on poverty reduction are likely to be low in most SSA settings, leaving little scope for indirect, second round effects driven by consumption multipliers.

4.1.2. Contract Coordination - Processing/trading with Contract Farming (Cf)

In contract farming, farmers agree with processors, through either formal or informal contracts, to limit their production and marketing behavior in return for some level of service provision and purchase guarantee from the processor. Unlike spot market trading, the agreed exchange is in promised goods and services rather than in already produced goods and services. These arrangements are best viewed in SSA as a response to widespread failure of input and credit markets and to poor or absent service provision. In addition to the need to ensure sufficient volume of purchases to reduce unit processing costs, concerns about product quality often significantly affect the structure of these relationships.¹

Examples of contract farming in Mozambique are predominantly found in the cotton and tobacco sub-sectors. Most schemes take the form of forward resource/management contracts.² Given the current stage of development of rural agricultural inputs and credit markets in the country, farmers have little access to those resources due to the failure of those markets in rural areas. The contracts, most of which are informal, are designed to fill that gap. They consist essentially in the firms supplying, on credit, seeds and other inputs (including chemicals) and technical assistance for the production by farmers on specific areas of land of the product in question. Farmers agree to utilize the inputs as instructed, and to sell all their production to the firms at harvest at agreed-upon prices. The costs initially supported by the firms are deducted at the time of the harvest. In most cases in Mozambique, government has granted the firm monopsony power, i.e., the farmers are not permitted to sell outside the outgrower scheme they are assigned to. This is to avoid the well-known free rider problem.³ These schemes are normally implemented in land "owned" by the individual farmers or farming communities, but there are

¹ Product quality concerns tend to become relatively more important determinants of the structure of these relationships in more developed market systems, where input and credit market failure may be less of an issue.

² These differ from the simple sale/purchase contracts because they include stipulations regarding the transfer and use of specific resources and/or managerial functions (Jaffee and Morton, 1995). Forward resource management contracts partially internalize product and factor transactions, and are sometimes referred to as interlinked contracts or interlinked markets (Minot, 1986; Glover and Kusterer, 1990; Dorward, Kydd, and Poulton, 1998).

³ The free rider problem refers to a situation where an individual receives the benefits of a public good or a positive externality without contributing to paying the costs of producing those benefits.

cases where the firms use designated areas or blocks within their own land concessions for that purpose (Strasberg, 1997). To reduce transaction costs, where farmer associations have been established, firms have frequently signed contracts with associations that represent a group of farmers.

While contract coordination is important to deal with market failure, to reduce uncertainty for farmers regarding access to markets and for processors regarding access to sufficient raw material of acceptable quality, and to some extent to reduce price risk for one or both parties, there are several potential limitations. First, widespread contractual coordination may raise price volatility in the remaining spot market transactions, due to the thinness of those markets and the lack of transparency across many contracts within the same sub-sector. This will reduce or distort the information supplied by those spot market prices. Second, contract farming arrangements may result in barriers to entry for farmers when processors limit suppliers to those who have given capabilities of meeting volume and standard requirements or have selected characteristics in the community - the already better off farmers for example. Third, these arrangements may result in a highly asymmetric bargaining situation where one or fewer buyers, often with monopsony power, can largely determine the prevailing price. Fourth, the cost of enforcing contract provisions can be very high due to opportunistic behavior by participants (both farmers and processors) and weaknesses in the existing legal system. As a result, contract farming is not always an economically viable alternative in the SSA setting. If it is not, then processors are left with a choice between spot markets and their demonstrated problems in the SSA environment, or vertical integration into plantation agriculture.

4.1.3. Vertical Integration - plantation Agriculture with Processing (PA)

Vertical integration exists when two or more separable stages of production or marketing are combined under common ownership and management. Integration can be complete (encompassing all vertical transactions in the subsector), or partial if it involves at least some sales (or purchases) of the intermediate products to (or from) outside agents (Jaffee and Morton, 1995). Plantation agriculture, which is the predominant type of integration in the Mozambican context, includes agro-industries that are involved in the processing of crops and have concessions of land for direct production of those crops.

There are several rationales for vertical integration. First, it may save logistical costs associated with the procurement of raw materials and the sale of outputs. Second, the firm can save on the cost of information, since it becomes the predominant supplier to itself for certain goods and services (Coase, 1937; Williamson, 1979). Furthermore, since decision making is centralized, adaptations or adjustments to changing technical or market conditions can in principle be done rapidly and without prior consultation or renegotiation with other firms. Third, by internalizing flows of intermediate inputs, certain risks associated with variability of suppliers and quality can be eliminated. Vertical integration may, therefore, be very effective in overcoming problems of risk and uncertainty. Fourth, like contract farming, vertical integration can be an effective response to market failure, particularly in early stages of market development.

The problems associated with vertical integration have to do with social as well as private costs. Social costs due to reduced tax revenue and market concentration arise from the fact that governments tend to treat market transactions differently from those that occur within the firm, which allows firms to evade or at least minimize the effects of taxes and market controls.

Vertical integration can also increase private costs. For example, where adjacent stages of production/trading are not scale compatible, costs for integrated firms are likely to be higher than for non-integrated ones. Large sunk costs in production will bias the firm towards internal supply, while external supply may be available in better quality and/or at lower prices.

The potential impact of plantation-based vertical integration on rural poverty alleviation is limited to wage earnings obtained by local people directly employed in agriculture and processing, consumption linkages from the re-spending of that wage income, and some, generally limited, backward linkages to service providers to the processing plants. The direct employment is normally for permanent as well as for non-permanent positions. The combinations of permanent vs non-permanent depend on the size of the plantations and the existing processing technology. Small farmers in independent plots are excluded from this arrangement. Examples of this type include the sugar, tea, coconut, rice and citrus sub-sectors.

4.1.4. Rural Association and Cooperatives - Community Integration (CI)

In general, associations can be formed by farmers, processors, wholesalers, retailers or exporters, in order to undertake joint investments, common practices, or collective self-regulation of competition. After a period of disfavor in the late 1980s, village level-cooperatives (farmer associations) organized around business activities are resurgent, especially as means to overcome liquidity constraints, information asymmetries, and minimum scales of production or marketing that can otherwise impede smallholder participation in rapidly growing sub-sectors (Jaffee and Morton, 1995; Candler and Kumar, 1998; Holloway et al., 2000). The individual agents in the group agree to act together in order to maximize their joint and individual private interests.

Voluntary cooperation supports commodity system investment and coordination because it can i) counter the problem of lumpy investments in marketing infrastructure and services; ii) serve to internalize certain externalities and allow for private provision of certain public goods such as market information and extension services; iii) reduce or pool member risks by guaranteeing commodity purchases and sales on behalf of members and by providing insurance and/or credit to members; iv) lower transaction costs for members and non-members trading with members; and v) exercise or counter market power for its members through collective negotiation with suppliers or buyers, by controlling member supply into the market and by informing members about prevailing terms of trade (Jaffee and Morton, 1995).

The problems associated with voluntary cooperation are two-fold. First, associations are often subject to a free rider problem when members outside the group capture part of the benefits from cooperative effort without contributing to the costs. Members of the groups may also be able to free ride by taking actions that yield them benefits above their proper share or reduce their contribution to group costs. Second, the size of the group may be important in determining the size of the costs and benefits. Small groups have the advantage that members receive a large share of the benefits and contribute substantially to the costs, which promotes the commitment to the group while giving each member bargaining power. The down side is that small groups are more likely to have highly covariant risks, limiting the potential for cooperative insurance and credit supply. Large groups, on the other hand, benefit members through economies of scale with more limited investments per member and a greater scope for pooling and spreading of risks. However, each member will have less information about other members which makes it

difficult to monitor behavior and detect free-riding by members. Asymmetric information and power may, therefore, prevail within the group. In some countries, NGOs play a role as intermediaries between agro-industries and farmer groups, and in helping those groups become profitable businesses associations.

Currently in Mozambique there is a concerted effort to promote the development of sustainable rural development initiatives among voluntarily established groups of households. These efforts involve the identification by NGOs of opportunities for the development of small to medium scale agro-processing firms with potential for increasing agricultural production while promoting the emergence of community-led agro-businesses designed to achieve sustainable growth in the medium to long run. The NGO contribution is initially in: i) organizing farmers in associations and aiding their formalization as sustainable businesses enterprises; ii) introducing a viable processing technology to be learned and managed by the community and facilitating the supply of some units on credit to the community; iii) supplying seeds and promoting seed multiplication initiatives, and providing technical assistance through an extension network within the communities; and iv) facilitating market linkages between the established associations and traders and local suppliers of the processing equipment when processing technologies are promoted. There has also been an effort to help producer associations link with large-scale processors in contract farming schemes. Examples of this type include the sunflower and sesame, maize, cashew, and cassava and other tubes sub-sectors.

From a poverty reduction standpoint, perhaps the most salient aspect of these arrangements is the local ownership of the processing facilities. This ownership means that any profits from processing are more likely to be spent or re-invested locally, rather than expatriated or spent on non-local tradables. Thus, consumption linkages, multiplier effects, and potential poverty alleviation are potentially very strong.

4.2. Transaction Costs Factors and Institutional Arrangements

It is generally true that structural adjustment policies in SSA have removed costly and unsustainable institutional responses to widespread market failure (price and movement controls, single channel marketing systems, heavy subsidies), but have failed to create the conditions under which alternative, more sustainable solutions could rapidly emerge. As a result, most African smallholders are left to grapple with missing or highly imperfect input and credit markets, poorly integrated output markets, and very poor service provision with few or any safety nets. The need for sustainable institutional innovations to deal with these market failures is acute. The success of any such innovation will be determined in large measure by how well it deals with the level and types of transactions costs facing rural smallholders, processors and trading firms. The discussion that follows is a review of specific factors likely to be associated with transaction costs, and of how they shape the type of institutional arrangement most suited to deal with them.

Each of the institutional arrangements defined in the previous sub-section involves a set of transactions that underlie them. In this context, transactions refer to the activities that allow or constrain transformation activities. A transaction occurs when two or more parts enter into a contract in which rights and obligations are exchanged. Transactions range from those where rights and obligations under the contract take place at a single instant in time - this is the purest form of spot market transaction - to those which involve a continuous exchange in which

reciprocal rights and obligations are part of the contractual arrangement, such as in the case of contract farming schemes and the long term relationship between plantation owners and their employees.

In essence, any given transaction comes bundled with a certain mix of characteristics - the degree of asset specificity, the degree and type of uncertainty to which they are subject, and the complexity and frequency with which the transactions occur - that are not easily separable from the transaction. For example, transactions which occur under isolated spot markets for low value commodities involve relatively low levels of all these characteristics. Transactions underlying a contract farming scheme have higher levels of these characteristics. In general, therefore, the greater the degree of asset specificity, the less likely is that spot markets will be relied upon - contractors will seek to negotiate contracts that protect their investment in face of external change. Low degrees of uncertainty, complexity and frequency may favor spot markets and reduce the need for vertical coordination. The opposite, however, may lead to the recognized need of building contractual relationships that acknowledge mutual interest in contracting, facilitate information flows and allow for a flexible joint response to changes in external circumstances. But such relationships require trust. Where trust cannot be established, vertical integration may be chosen instead (Dorward, Kydd, and Poulton, 1998).

The challenge for investors and farmers is to choose what types of transactions to engage in. That choice will be based on their assessment of a set of factors listed in Table 1.

The degree to which each of these factors affect transaction costs vary across the different sub-sectors. Competitive forces may lead to the emergence of forms of economic organization that minimize total costs of production and exchange in the economic system (Staatz, 1988). Thus, the type of arrangement that minimize the sum of production and transaction costs will have an economic advantage and will tend to dominate that activity.

The analysis identifies a number of factors hypothesized to influence the level of transaction costs, and ultimately the fitness of given organizational forms to specific sub-sectors. Factors within the following four broad categories are considered: i) commodity production characteristics; ii) commodity processing/marketing characteristics; iii) the exogenous economic and political environment; and iv) the endogenous economic and political environment. Table 1 summarizes the discussion that follows. The treatment here is general - in section V we will apply the same framework to specific subsectors within Mozambique to begin to assess the scope for policy action to influence the choice of organizational form, and through that, the impact of agro-industrial investment on poverty reduction.

4.2.1. Production Characteristics

We examine three transaction cost factors associated with a commodity's production characteristics: i) labor intensity; ii) economies of scale in production; and iii) high returns to inputs and complex production management.

High labor intensity in the production of a crop leads to high supervision costs in a principal-agent setting. This factor thus most favors the independent smallholder organization that links to processors/marketers through spot markets (IP), as this arrangement largely eliminates principal-agent problems in the production phase. Contract farming (CF) and arrangements or links with

community based processors (CI) can also be effective if the processor can minimize negative effects to itself of reduced labor input by the farmer. Processing with plantation agriculture fully exposes the processor to opportunistic behavior by farm employees, and is thus least favored by this production characteristic. Unlike plantation agriculture (PA) schemes that normally involves a somewhat relatively more capital intensive technology, those arrangements normally use capital saving and labor using agricultural production technologies.

Economies of scale, to be achieved and sustained, normally require high initial investment and cash flow. Therefore, in most SSA settings this characteristic favors vertically integrated investments (PA) that are capital using, have a high level of processing capacity and are normally linked to external markets.

High returns to inputs and complex management imply high returns to extension and research and use of purchased inputs. This factor thus favors plantation agriculture (PA) or, if other factors are favorable, contract farming (CF) arrangements. In the absence of well functioning factor markets and a reasonable knowledge base, this transaction cost factor acts strongly against the use of spot markets (IP).

Table 1. Relationship between Transaction Cost Factors and Types of Institutional Arrangements Most Favored

Factor		Effect on Transactions Costs	Type of Agro-Industrial Investment Favored ¹			
			IP	CF	PA	CI
Production characteristics						
High labor intensity	Increases supervision costs and require capital saving/labor using technologies.	X	X		X	
Economies of scale	Requires high initial investment and high cash flow to be sustainable; generally not feasible for smallholders.			X		
High returns to inputs, complex management	Requires effective research and extension, as well as timely availability of inputs.		X	X		
Marketing/processing characteristics						
High economies of scale in processing	Leads to the need for scale complementarity that creates strong incentives for stable supply of raw materials through more coordinated arrangements.		X	X		
High quality standards	Increases returns to close vertical coordination.		X	X		
High perishability	Increases the costs of not having a stable market. Increases returns to close vertical coordination.		X	X		
High value to weight/volume	Increases risk of large loss in farm to market transaction.		X	X	X	
Low value to weight/volume	Increases unit transport costs.			X		
Principal market is export	Tends to reduce number of buyers and risk of default in CF; quality standards usually higher; greater economies of scale.		X	X		
Many potential buyers	Increases cost and risk of default in CF.	X		X	X	
Requires processing before final sale	Tends to reduce number of buyers and risk of default in CF.		X	X		
Exogenous economic & political factors						
Land scarcity/high population density	Increases land cost, political difficulties obtaining large tracts.	X	X		X	
Agriculture has a large share in the labor force	Increases land cost, political difficulties obtaining large tracts.	X	X		X	
Endogenous economic & political factors						
Poorly integrated output markets	Increases procurement costs and marketing costs in general. Increases returns to vertical coordination.		X	X		
Missing input/factor markets	Non availability of necessary production inputs limits reliance on spot markets and increases the returns to vertical coordination.		X	X		
Poor communications	Raises cost of active vertical coordination, especially contract negotiation and enforcement.	X		X	X	
Low literacy/educational levels among farmers	Raises cost of ensuring adoption of new production technologies/management practices; raises cost of collective action.	X		X		
Weak property rights enforcement	Increases uncertainty with regard to reliance in contracts and the use of collateral. Increases the risk of default in CF.	X			X	
Weak local government	May make coordination more difficult; may be easier to accumulate large tracts of land.	X		X		

¹ IP=Processing with Independent smallholder producers; CF=Processing with Contract farming; PA=Processing with Plantation agriculture; CI=Processing with local ownership ("community integration")

4.2.2. Processing/marketing Characteristics

Most commodity-specific transaction costs arise in this phase of the production-marketing chain. The factors included here are: i) high quality standards/specificity; ii) high perishability; iii) high value to weight/volume; iv) low value to weight/volume; v) export market orientation; vi) many potential buyers of farm production; and viii) processing requirement before sale.

High economies of scale in processing characterizes the large scale technologies. It leads to the need for scale complementarity that creates strong incentives for stable supply of raw materials through more coordinated arrangements. In those sectors where no competitive small-scale option is available the coordinated arrangements are more likely to succeed than in those where a small scale option is available.

High quality standards/specificity increase returns to vertical coordination and thus tend to discourage spot market transactions. This coordination can be achieved either through vertically integrated plantation agriculture (PA) or well-managed contract farming (CF) operations that ensure access by farmers to needed inputs in a timely manner and provide them with the necessary skills to grow efficiently specific crops with consistent quality.

High perishability also increases the returns to vertical coordination and tends to discourage arrangements with independent small-scale farmers and to some extent community based arrangements. But, depending on the crop, if the processing and storage technologies are available and there is effective demand, this can well favor this later type of arrangement. CF and PA arrangements are most favored.

High value/weight ratios per volume are normally associated with high risk of large losses in transactions from the farm. This factor tends, therefore, to favor more coordination than can be provided through spot markets. Low value/weight ratios are normally associated with high transport costs. If such a commodity requires processing and shows economies of scale in production, it will be most fitted to vertically integrated arrangements (PA). Sugar cane is a good example of such a commodity. If the commodity has little market in processed form, it will tend to be very thinly traded in spot markets, such as manioc in most of SSA. . It is worth noting that if there are flexible and small scale processing units that can easily be located in various places, this factor may favor other organizational forms as well.

Items that are *primarily produced for export markets* are risky to produce in a marketing structure that is not structured to handle them. It tends to demand high quality standards and reduce the number of buyers - specially if it needs to be processed before exports - and, therefore, favors contractual (CF) and vertically integrated (PA) forms of organization. Continuity in raw material supply of specified quality to comply with export requirements make reliance on spot markets difficult.

Many potential buyers for a commodity implies that the costs and risks of default on cash- or in-kind credit are high. This characteristic therefore precludes CF, unless property rights are more enforceable than is typically the case in SSA. Spot market transactions (IP) are most favored, but vertically integrated arrangements (PA) may also be feasible, especially if quality and price uncertainty of raw material for processing are relevant issues, or procurement and transport cost are high.

A product *requiring processing before final sale* tends to reduce the number of buyers and thus the risk of default. Vertically coordination mechanisms such as CF and PA are favored, in part because they need the assurance of consistent/specific quality of semi-processed raw materials.

4.2.3. *Economic and Political Environment Factors*

As previously stressed, the transaction costs that prevent factor and output markets from functioning properly are a result of the economic and political system smallholders and firms face in many regions. Lack of a strong public infra-structure and legal base, aggravated by unstable political systems increase transactions costs for all actors. Furthermore, poor resource endowments, including land, capital inputs and human capital are serious limitations. We focus on six elements of the economic and political environment, divided into factors that are largely exogenous to policy decision-making, and those that can be considered endogenous to such decision making. Exogenous factors have to do with the relative local endowments of labor and land, as well as the structure of the labor force in the economy. Endogenous factors relate to the nature of the factor and product markets and the strengths/weaknesses of the political and legal systems that influence the business environment.

4.2.4. *Exogenous*

Land scarcity/high population density and an economic structure that is characterized by a large share of the domestic labor force engaged in agriculture both tend to increase the cost of land and also increase the political difficulties of obtaining large tracts of land for direct production. These factors therefore favor systems based on smallholder production, i.e., arrangements with small producers through spot markets (IP) and contract farming (CF). Arrangements with CI would also be appropriate.

4.2.5. *Endogenous*

Poorly integrated output markets and *missing factor markets* limit the effective scope of spot markets (IP) to low value crops requiring few inputs and little complex management. Higher value crops under these circumstances will most likely rely more on contracts (CF), and vertical integration (PA) or on local resources and local effective demand (dynamic CI).

Weak property rights and lack of a system that assures contract enforcement discourages transactions that involve great asset specificity. If in addition communications are poor, if farmers have low levels of literacy, if contingency markets are underdeveloped, and if physical infrastructure is also very poor, investors and farmers may limit themselves to transactions that are relatively certain, simple (not complex), and not repetitive (low frequency), i.e., they will limit themselves to isolated spot market transactions of low value commodities. As these and other factors improve, agents will become willing to engage in transactions (like those required in contract farming or community integration) that involve more uncertainty and complexity, more up-front investment (implying some asset specificity) and sequential interactions.

Finally, *weak local governance* may make vertical coordination more difficult, favoring IP arrangements; it may also make it easier to accumulate large tracts of land for direct production,

which would favor PA arrangements. CF arrangements, to be effective and gain economies of scale in reaching smallholders, are better fitted to an environment where communities are capable of getting organized in groups (coops, associations, etc) - which is not likely under this environment as it makes coordination more difficult. CI investments are, by nature, highly dependent on this factor which determines its existence in the first place.

The bottom line is that individual commodities produced by smallholders have different characteristics and are produced and marketed in various economic and political environments. Therefore, there is a need to explore the type of institutional arrangement that is more likely to fit specific commodities. To effectively influence investors choices regarding the types of institutional arrangements in their relation with smallholders, those transaction cost elements need to be bore in mind and dealt with in a consistent manner that potentially leads to the joint maximization of rural smallholder welfare and firm profits. The multiplicity of transaction cost factors that characterize many sub-sectors makes this a very challenging policy making process. Section V, introduces a detailed discussion of those issues.

4.3. Institutional Arrangements and Poverty Reduction

Under ideal conditions - full set of efficient markets, including contingency markets, a well developed physical and communications infrastructure, highly educated populace and effective property rights enforcement - spot markets will be the best and most desirable organizational form. The reality, however, is that many of those conditions are not present in many countries, even among the more developed ones. In SSA, that is no exception and Mozambique is just a particular example. Therefore, the presence of factors that lead to increasing transaction costs in the relationship between firms and farmers, give rise to alternative institutional arrangements for managing transactions. Such arrangements include vertical coordination mechanisms that include a wide range of contract farming approaches, and fully vertically integrated plantation agriculture arrangements.

To have a positive effect on rural poverty reduction in a sustainable manner, a necessary (but not sufficient) condition for any arrangements is that it must be profitable for both the firm involved and also for rural residents. Also, the issue of who, within the income distribution scale, grows specific crops and how profitable they are, is essential to judge the direct impact on income inequality of this arrangement. Growth in rural incomes as a result of multiplier effects depend on the patterns of demand and the structure and flexibility of response of the non-farm economy to changes in effective demand.

In general, the relation between institutional arrangements and poverty alleviation is not linear and is likely to be commodity specific - each arrangement has its own strengths and weaknesses and a set of policy interventions to help the process is an important ingredient. Some types of interventions include investment in marketing infrastructure (roads and market information), public investment in education, reinforcement of the role of rural communities, facilitate the legislation regarding association development, share costs in the provision of extension services for some contract farming schemes, refine land policy, and improve legal systems in rural areas. The challenge is in balancing the costs and benefits of alternative policies and investments.

The final judgment about the impact of sub-sector specific arrangements on rural poverty of a given region is an empirical question. However, two key facts can be referred to within the current context.

- Due to poor endogenous political and economic factors, spot markets (IP) do not support high value crops in most SSA settings. As a result, if spot markets are the only institutional option, farmers will be limited to low value crops, will be subject to high marketing costs, great uncertainty, fluctuating prices and information asymmetries. They will be exposed to a host of problems that make it very difficult for them to escape poverty, and
- Plantation agriculture (PA) will almost always generate less poverty reduction than will reasonably successful CF schemes, due to growth linkage effects. Plantation agriculture may result in high volumes of investment and the adoption of significantly high capital/labor ratios in production, processing and marketing. If that is the case, the likelihood of excluding large numbers of farmers will be high and the potential direct effects on poverty of that form of organization will be significantly limited (weak production linkages). Second round effects through consumption linkages will also be limited if the employment generated locally is weak and the leakage effects are strong, i.e., a large share of the incomes is not spent locally.

The challenge for policy makers is, therefore, to find ways to make contract-based relationships (CF) successful in both efficiency and equity grounds, i.e., financially attractive to firms while profitable for a reasonable number of small farmers. In section V we apply the framework laid-out in this section to specific commodities to help identifying such strategies by highlighting cases in which key factors that policy makers and donors can influence might “tip the balance” and allow investors to move from IP or PA to CF. It is important to note that there is a wide menu of CF approaches with differing degrees of poverty reduction potential.

5. RECONNAISSANCE STUDY RESULTS

This section presents the reconnaissance study results. It draws from the information collected during the field work and applies the concepts developed in previous sections. The findings are divided into three parts. First, we present an overview of the current agro-industrial investments in the country and analyze their characteristics from various angles and using the typology developed in Section IV. Then, we use the transaction costs analysis - also introduced in Section IV - to discuss alternative arrangements and policy interventions in selected sub-sectors. Finally, we make some considerations on government incentives for agro-industrial investments in the country.

5.1. An Overview of Agro-Industrial Investments in Mozambique

Developing an inventory of the current and planned agro-industrial investments in Mozambique and placing them within the typology of organizational forms suggested in Section IV is one of the major objectives of phase I. To achieve that and create the basis for more in-depth work on specific businesses, detailed secondary data were collected on a universe of over 300 rural based projects approved by the Center for Investment Promotion (CPI) between 1985 and mid-2001. The database and the analysis only include projects that are owned by the private sector. Therefore, given the nature of their ownership, CI projects are not included.

In this section, we present an overview of the current agro-industrial investments in the country, with special emphasis on: i) how current and planned agro-industrial investments fit within the broader universe of rural based investments; and ii) characterization of the sub-sample of investments in agro-industry with respect to their location, sources of finance, market orientation, and relationship with the smallholder sector.

5.1.1. Distribution of Rural Based Investments

Although the focus of this work is on agro-industrial investments and their relationship to rural poverty, this analysis starts by placing those agro-industrial projects within the context of all rural based projects. Rural based projects are defined as those located in rural or peri-urban areas, employing directly or indirectly rural population and working with raw materials (or livestock) typically grown (or raised) in rural areas. These include activities such as medium and large scale agriculture and livestock production, forestry and wildlife related businesses, and agro-industrial activities. Agro-industry refers only to activities that have a processing component, with or without a direct agricultural production component.

Table 2. Sectoral Distribution of Rural Based Investment Projects

Sectors of Activity	All Rural Based Projects				
	Distribution of Projects		Value of Investments		
			Total	Average	
Rural Based Projects in:	--- number ---	--- % ---	thousand \$US	--- % ---	thousand \$US
Agriculture, Livestock or both	136	43	216,420	22	1,591
Agro-Industrial ²	110	35	576,566	59	5,242
Forestry/Wood-processing	58	18	172,814	18	2,980
Other ¹	11	4	8,148	1	741
Total	315	100	973,948	100	3,092

Source: 1985-2001 Project Database based on the CPI archives.

¹ Other rural based projects.

² Agro-Industry refers to any project that has an agricultural processing component, with or without a direct agricultural production component.

The majority of the rural based projects (Table 2) are in the area of agriculture and livestock (43%) without a processing component. Agro-industrial investments are the second major sub-group (35%) of all rural based projects. The remainder are projects in forestry and wood-works and other rural based projects. In terms of total value invested, agro-industry is the most important sector accounting for almost 60% of the total invested in the period. The average value of agro-industrial investments is also higher than that for the other sectors of activity.

5.2. Trends and Patterns in Agro-industrial Investment in Mozambique

Since the signature of the peace accord in 1992 and the subsequent first democratic elections in the country in 1994, there has been a significant inflow of capital to support investments in Mozambique. Some general and sub-sector specific patterns are shown in Table 3:

- There has been a tremendous increase in the volume of investment in rural based projects, including agro-industry, over the past 15 years. In terms of value invested, agro-industrial investments represented, on average almost 60% of all rural based projects in the period 1985-mid 2001;
- The total value invested in agro-industry increased about 5 times from the period 1985-1990 to 1991-1996, from \$33.4 million to over \$161 million. Then it more than doubled from that period to 1997-2001;
- Over the entire period, the focus of investment has moved from cotton and tobacco (1985-1990) to a more balanced diversification of investments in sectors like maize cotton and cashew, in the first half of the 1990's. More recently, since late 1990's, there's been significant investments in the sugar sector, and some in tea as well. In fact,

Table 3. Trends in Agro-Industrial Investments, 1985-mid 2001

Type of Investments	Periods						Total	
	1985-1990		1991-1996		1997-Mid 2001			
All Rural based (000 US\$)	48,461		281,535		643,952		973,948	
Agro-industrial Investment								
Value (000 US\$)	33,481		161,960		381,125		576,566	
% of all rural	69%		58%		59%		59%	
% of Total Agro-industrial Investment and Sub-sector Ranking								
Sub-sectors Rankings	1985-1990		1991-1996		1997-Mid 2001		Total	
	Sectors	%	Sectors	%	Sectors	%	Sectors	%
Rank #1	Cotton	97	Maize	32	Sugar	64	Sugar	42
Rank #2	Tobacco	3	Cotton	26	Tea	12	Cotton	15
Rank #3	-	-	Cashew	22	Other	9	Maize	11
Rank #4	-	-	Other	11	Cotton	4	Other	9
Rank #5	-	-	Oilseeds	6	Citrus	4	Tea	8

Source: 1985-2001 Project Database, based on CPI Archives.

Notes: There are in total nine (9) processing sectors included: Maize, sugar, tea, cashew, tobacco, fruits, oilseeds, cotton and other. Other include a mix of processing sectors, including coconut, rice, pigeon pea, wheat, etc. Since we are only counting the first 5 major investments per period, the percentages do not necessarily sum up to 100.

investment in tea alone during the final period exceeded all recorded investment during the first period.⁴ Not shown in these data due to their recent emergence are investments by several tobacco companies in contract farming and processing operations in the north of the country.

5.3. Agro-Industrial Investments and Institutional Arrangements with Smallholders

Table 4 places agro-industrial investments within the suggested typology based on the institutional arrangements with smallholders. It indicates that nearly two thirds of projects (62%) fall within the businesses that buy raw materials in spot markets (IP), i.e., those regarded as having forward production linkages with smallholders in rural areas by dealing with them as independent producers.

⁴ Despite the probable undercounting of recorded investment in the first period, the basic patterns shown - increased diversification - is believed to remain valid as a trend in subsequent periods.

Table 4. Agro-Industries and Institutional Arrangements with Smallholders

Sectors of Activity	Agro-Industrial Investments				
	Distribution of Projects		Value of Investments		
			Total	Average	
Organizational/Linkage Type	--- number ---	--- % ---	thousand \$US	--- % ---	thousand \$US
Spot Markets - Processing with Independent Smallholder Producers (IP)	68	62	261,860	45	3,851
Contract Coordination - Processing with Contract Farming (CF)	21	19	130,446	23	6,212
Vertical Integration - Processing with Plantation Agriculture (PA)	21	19	184,260	32	8,774
Total	110	100	576,566	100	5,242

Source: 1985-2001 Project Database based on the CPI archives.

Note: Given its nature, Community Integration (CI) arrangements are not included in this analysis.

This is also the type that has the highest total amount invested (about 45%) of the total for the period, but has the lowest average value per project, just below \$4 million. The major sub-sectors in this type include cashew in the southern and northern parts of the country, maize all over the country. This type is somewhat common in some other sub-sectors.

Vertically integrated agro-industries (PA) and those with contract farming arrangements (CF) constitute about 19% of the sub-sample each. PA investments accounted for 32% of the total value invested in agro-industries and have the highest average value invested - \$8.8 million. This is a reflection of its capital-using/labor-saving nature. The majority of PA investments are those involved in sugar plantation in the central and southern parts of the country and tea in Zambezia province.

Both sectors are undergoing significant additional investments and are strengthening links with external markets. Other, once important, sub-sectors that fall in this type are rice and coconut in various parts of the country.

Agro-industries institutionally linked to smallholders through contract farming (CF) accounted for 23% of the total investment and have an average investment value of \$6.2 million. This type is predominant in cotton production areas, but also increasingly in other crops such as tobacco. Contract farming schemes in cotton have been evolving, especially as a result of missing credit and input markets in those areas. Reduction in transaction costs is achieved through the development of producer associations among farmers. Besides the cotton processing activities, these CF firms may involve oil and soap processing from cotton seeds.

Some small and medium scale private or community owned oilseed processing units have also developed rapidly in those areas with technologies promoted by international NGOs. Some

diversification crops such as sunflower and sesame are normally also involved. This is part of what we refer to as Community Integration (CI) in Section IV, but also involve small scale IP investments.

5.4. Distribution of Rural Based Investments by Province

Rural based projects in general are unevenly distributed and somewhat concentrated. Several factors contribute to that: i) the structure and the conditions of the rural marketing infrastructure; ii) the differential natural resource base across the regions; and iii) the inherited structure of investments left by the colonial settlers and the lack of coherent rural and agro-industrial development policies in the past decades.

Results in Table 5 indicate that rural based projects are concentrated, particularly in Maputo province (about 30%). Overall, other important areas are Nampula in the north and to some extent Manica, Sofala and Zambezia. The other provinces are just marginally. In terms of amounts invested, Table 5.5 indicate that from the estimated total of \$974 million invested during the period, about 34% was directed to Maputo province and about 22% to Sofala province in the central part of the country. The remainder was invested in the other provinces in shares that vary from 2% in Tete to 13% in Zambezia.

Table 5. Distribution of Investments by Province (% of Projects)

Location	All Rural Based Projects ¹	Agro-Industrial Projects Only ²			
		IP	CF	PA	Total
Provinces	----- percent -----	----- percent -----			
Niassa	4	2 (34)	5 (33)	5 (33)	3 (100)
Cabo Delgado	7	7 (71)	9 (29)	0 (0)	6 (100)
Nampula	13	22 (65)	24 (20)	19 (15)	22 (100)
Zambezia	9	4 (20)	29 (40)	29 (40)	14 (100)
Tete	2	2 (100)	0 (0)	0 (0)	1 (100)
Manica	10	4 (50)	9 (33)	5 (17)	6 (100)
Sofala	11	4 (37)	14 (38)	9 (25)	7 (100)
Inhambane	5	15 (100)	0 (0)	0 (0)	9 (100)
Gaza	9	10 (78)	10 (22)	0 (0)	8 (100)
Maputo	30	30 (74)	0 (0)	33 (26)	24 (100)
Total	100	100 (62)	100 (19)	100 (19)	100 (100)

Source: 1985-2001 Project Database based on the CPI archives.

¹ Includes rural based projects in agriculture, livestock, forestry & wood-processing, and agro-industry.

² Agro-Industry refers only to projects that have a processing component, with or without a direct production component: IP=Processing with independent smallholder producers; CF=Processing with contract farming; PA=Processing with plantation agriculture

Table 6. Distribution of Investments by Province (Value of Investment)

Location	All Rural Based Projects ¹	Agro-Industrial Projects Only ²			
		IP	CF	PA	Total
Provinces	Total Value (thousand \$US) percent	Total Value (thousand \$US) percent			
Niassa	14,740 2	3,257 1	4,288 3	437 0	7,982 1
Cabo Delgado	71,392 7	6,379 2	33,228 25	0 0	39,607 7
Nampula	77,269 8	23,407 9	171,230 13	21,725 12	62,255 11
Zambezia	124,544 13	9,821 4	52,794 40	12,772 7	75,387 13
Tete	19,530 2	45 0	0 0	0 0	45 0
Manica	49,687 5	11,972 5	2,561 2	857 0	15,391 3
Sofala	216,707 22	19,932 8	8,678 7	72,460 39	101,070 18
Inhambane	18,797 2	15,493 6	0 0	0 0	15,493 3
Gaza	54,068 6	12,547 5	11,773 9	0 0	24,321 4
Maputo	327,215 34	15,901 61	0 0	76,009 41	235,015 41
Total	973,948 100	261,860 100	130,446 100	184,260 100	576,566 100

Source: 1985-2001 Project Database based on the CPI archives.

¹ Includes rural based projects in agriculture, livestock, forestry & wood-processing, and agro-industry.

² Agro-Industry refers only to projects that have a processing component, with or without a direct production component: IP=Processing with independent smallholder producers; CF=Processing with contract farming; PA=Processing with plantation agriculture

5.5. Distribution of Agro-Industrial Investments by Province

A similar pattern of project distribution is observed regarding the agro-industrial investments. Table 5 presents the distribution by province in terms of numbers of projects, and Table 6 introduce the distribution by province in terms of total value invested.

- In terms of numbers, Maputo Province predominates in both IP and PA, but not in contract farming institutional arrangements (CF). In terms of total value invested, from the total amount of \$262 millions invested in IP projects, 61% are in Maputo, particularly in the Maize milling (Table 5). The second most important province is

Nampula with 9%, predominantly invested also in Maize milling and cashew processing (Table 6). The central provinces of Manica and Sofala have some important emerging investments in mango and citrus, which have very significant growth prospects for the coming years. These investments rely heavily on Middle Eastern capital and have a secure export market in that region;

- One third of the PA projects are in Maputo, 29% in Zambezia, and 25% in Sofala where at least two important sugar companies operate. From the total of \$184 million invested in the period, about 41% was invested in Maputo, 39% in Safala, and only 12% in Nampula and 7% in Zambezia. Table 6 indicate that investments in Sugar (predominantly PA) are mostly in Maputo and Sofala, and Tea PA investments are all concentrated in Zambezia Province.
- Regarding CF based investments, the predominant regions are Nampula and Zambezia that together account for over half of the contract farming investments in the country, especially in cotton. Tobacco production under this arrangement is a recent phenomenon. In terms of values invested in CF projects, from the estimated \$130 million invested in the period, 40% was invested in Zambezia, 25% in Cabo Delgado and 13% in Nampula.

Table 7. Commodity Sub-sectors by Institutional Arrangement and Location

Commodity Sector	Share of Agro-industrial Investment Projects ¹				Share of Value Invested in Agro-industrial Projects ¹				Location	
	IP	CF	PA	Total	IP	CF	PA	Total	(provinces) — top three ... —	
	% within type of link (% within commodity sector)				% within type of link (% within commodity sector)				... in % of investment projects	... in % of value invested
Maize	29 (91)	0 (0)	9 (9)	20 (100)	24 (99)	0 (0)	0 (1)	11 (100)	Maputo Nampula Sofala	Maputo Sofala Nampula
Oilseeds	19 (76)	14 (18)	5 (6)	15 (100)	7 (80)	3 (18)	0 (2)	4 (100)	Inhambane Nampula Maputo	Inhambane Nampula Maputo
Sugar	1 (33)	0 (0)	9 (67)	3 (100)	42 (45)	0 (0)	74 (55)	42 (100)	Maputo Sofala	Maputo Sofala
Tea	2 (12)	10 (25)	24 (63)	7 (100)	2 (9)	22 (63)	7 (28)	8 (100)	Zambezia	Zambezia
Cotton	2 (7)	62 (93)	0 (0)	13 (100)	0 (0)	67 (100)	0 (0)	15 (100)	Nampula Zambezia Sofala	C Delgado Zambezia Nampula
Tobacco	1 (33)	5 (34)	5 (33)	3 (100)	1 (71)	0 (9)	0 (20)	1 (100)	Manica Maputo	Maputo Manica
Cashew	31 (100)	0 (0)	0 (0)	19 (100)	16 (100)	0 (0)	0 (0)	7 (100)	Nampula Maputo Gaza/Inhambane	Nampula Gaza Inhambane
Fruits	12 (100)	0 (0)	0 (0)	7 (100)	7 (100)	0 (0)	0 (0)	3 (100)	Manica Nampula Gaza	Manica C Delgado Nampula
Other ²	3 (14)	9 (14)	48 (72)	13 (100)	1 (11)	8 (20)	19 (69)	9 (100)	Maputo Nampula Zambezia	Nampula Maputo Gaza
Total	100 (62)	100 (19)	100 (19)	100 (100)	100 (45)	100 (23)	100 (32)	100 (100)	Maputo Nampula Zambezia	Maputo Sofala Zambezia

Source: 1985-2001 Project Database based on the CPI archives.

¹ Agro-Industry refers only to projects that have a processing component, with or without a direct production component: IP=Processing with independent smallholder producers; CF=Processing with contract farming; PA=Processing with plantation agriculture.² Other include mixture of crops: predominantly imported raw material, rice, coconut, pigeon pea, etc

5.6. Sources of Financing by Type of Agro-Industry

Table 8 details for the period analyzed, the distribution of agro-industrial investments across different sources of direct investment⁵: i) exclusively domestic (DDI); ii) exclusively foreign (FDI); and iii) foreign and domestic (DDI and FDI). Overall, just over half of the investments relied exclusively on DDI, over a third on joint sources (DDI and FDI) and only about 13% on FDI alone. Although PA businesses rely heavily on DDI, FDI is also more prevalent in that type than in other types. That is in part due to the recent injection of Mauritian capital in the rehabilitation of the sugar industry. Also, over two thirds of CF arrangements rely on Joint Ventures (DDI and FDI). Overall, about 75% of the total value invested over the period was put by projects that rely in joint ventures.

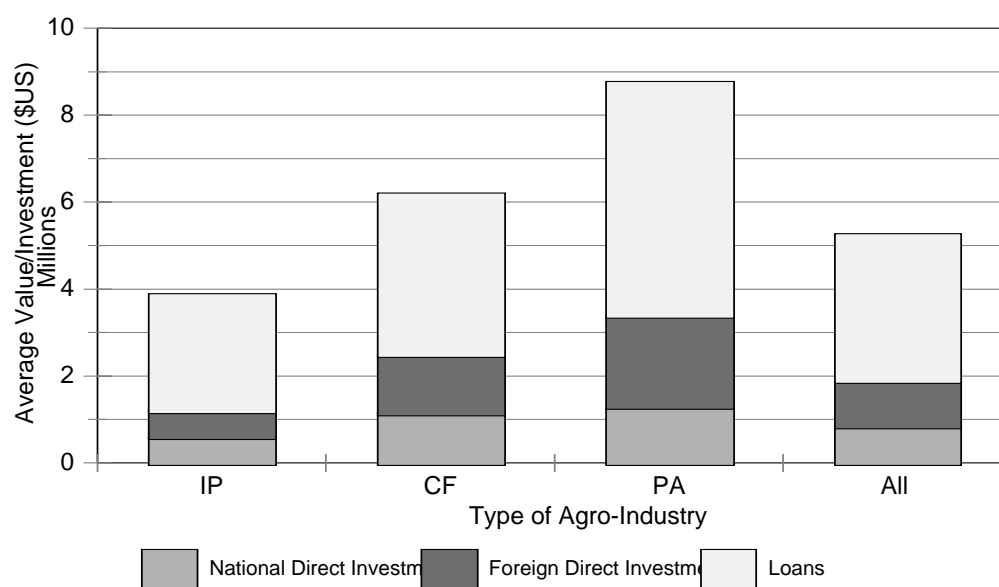
Table 8. Sources of Financing by Type of Agro-Industry

Sources of Financing	Agro-Industrial Projects Only ¹			
	IP	CF	PA	Total
Among all AI:	<p>----- % of projects -----</p> <p>----- total value invested in thousand \$US -----</p> <p>----- (total value invested in %) -----</p>			
Domestic Direct Investment only (DDI)	57 49,509 (19)	24 14,327 (11)	62 25,818 (14)	52 89,654 (16)
Foreign Direct Investment only (FDI)	10 22,806 (9)	9 9,239 (7)	24 23,094 (13)	13 55,139 (10)
Domestic and Foreign Direct Investment	33 189,545 (72)	67 106,880 (82)	14 135,348 (73)	35 431,773 (75)
Total	100 261,860 (100)	100 130,446 (100)	100 184,260 (100)	100 576,566 (100)
Among all AI Projects:				
% with some domestic or foreign loans	90	91	81	88

Source: 1985-2001 Project Database based on the CPI archives. ¹ IP=Processing with independent smallholder producers; CF=Processing with contract farming; PA=Processing with plantation agriculture

⁵ Direct investment refers to the value directly contributed to a project by an investor (national or foreigner) in terms of financial or physical assets (equipment). A significant number of the projects complement that with sources of financing from the domestic and/or foreign banking system. The total value of investments reported in this study takes into account all those sources.

**Figure 1. Capital Invested and Sources
Average Value by Agro-Industry Type**



Source: 1985-mid 2001 Project Database based on CPI archives.

Agro-Industry Types: IP=Processing with independent smallholder producers; CF=Processing with contract farming; PA=Processing with plantation agriculture

Regardless of the main direct investment source, it is worth noting that over 88% of the investments between 1985 and 2000 have had some domestic or foreign loans associated with them.

Figure 1 gives a rough indication of the average total value and average shares between DDI, FDI and loans across the various types and for all agro-industrial investments. Three points bear mentioning. First, the higher the degree of vertical integration, the higher the average total investment - the mean volume of PA investments are over \$8 million dollars, followed by CF that is just above \$6 million, and IP just below \$4 million. Second, on average, the share of loans is higher than the other sources for all types - making up over 50% of the total mean volume. Third, while the FDI share is somewhat higher than DDI for PA investments, there is no significant difference for the other types.

5.7. Market Orientation by Type of Agro-Industry.

Given the lack of domestic effective demand in many parts of Mozambique, the sustainability of agro-industrial investments over time greatly depends on the ability to connect to export markets.

Table 9 gives an indication about the reported output markets targeted by the various investments. It indicates that while many PA and IP investments are oriented exclusively towards the domestic market or to a combination of domestic and foreign, CF are mostly oriented towards the export markets or to a greater extent to a combination but not to the domestic market alone. It is consistent across the board that projects that are reported to be oriented to the export markets or to a combination of domestic and export - about 66% overall - absorb most of the investments (over 86%). Figures range from 79% for IP projects, 89% for PA projects, to 100% for the CF projects.

Table 9. Market Orientation by Type of Agro-Industry

Market Orientation	Agro-Industrial Projects Only ¹			
	IP	CF	PA	Total
Output market	<p>----- % of projects -----</p> <p>----- total value invested in thousand \$US -----</p> <p>----- (total value invested in %) -----</p>			
Domestic only	40 55,755 (21)	0 0 (0)	52 22,031 (12)	34 77,786 (13)
Export Only	4 2,489 (1)	33 55,187 (42)	5 1,619 (1)	10 59,295 (10)
Domestic and Foreign	56 203,616 (78)	67 75,259 (58)	43 160,610 (87)	56 439,485 (76)
Total	100 261,860 (100)	100 130,446 (100)	100 184,260 (100)	100 576,566 (100)

Source: 1985-2001 Project Database based on the CPI archives.

¹ IP=Processing with independent smallholder producers; CF=Processing with contract farming; PA=Processing with plantation agriculture

5.8. A Transaction Cost Analysis of Alternative Arrangements

This section applies the concepts developed in section IV to analyze the factors influencing choice of organizational form in specific sub-sectors in Mozambique. We first compare the “theoretically feasible” forms suggested by transaction cost factor analysis with the actually observed forms, and with perceptions among actors regarding possible alternatives. This analysis is presented for maize, cashew, cotton, and sugar in Tables 10 through 13. Next, for each selected sub-sector, we review the factors driving the observed organizational forms, the problems participants face, and the prospects for alternative organizational forms to successfully address those problems. We also assess whether such alternatives are desirable from a poverty reduction point of view and what actions are needed by private sector and government. This analysis is summarized in Table 14.

5.8.1. Theoretically Feasible and Observed Arrangements

This section summarizes the analysis presented in detail for selected sub-sectors in Tables 10 through 13 on favored versus observed types of agro-industrial investments in Mozambique. The sub-sectors analyzed are maize, cashew, cotton and sugar.

5.8.2. Maize Sub-sector

The analysis of the maize sub-sector is introduced in Table 10. This is a key staple crop in the country that is widely produced by rural households and consumed in both rural and urban areas. Production is predominantly by independent smallholder farmers using very simple production technology. It is essentially a labor using technology, with no significant economies of scale and without widespread use of chemical inputs that can, however, be increasingly used without the complex management typically required on high value crops. These production characteristics do not call for strong vertical coordination and drive the sub-sector towards independent production by smallholder farmers (IP). Furthermore, the fact that processors have to compete with many other buyers for a crop that can be traded domestically or exported without prior processing, increases dramatically the risk of default in CF schemes. Also, alternative forms of processing - local hammer mills and home hand pounding - create a highly dispersed domestic market for final sale, which also makes CF highly problematical due to credit default.

Contract farming schemes are further disfavored because of problems of contract enforcement due to a weak legal system in rural areas, increased costs of coordination especially for the monitoring of credit recovery and the delivery of extension assistance due to poor communications. This is all aggravated by low literacy among farmers that makes extension delivery for the dissemination of improved technologies particularly costly.

In reality, we observe the predominance of spot marketing (IP) arrangements, though some investors are increasingly suggesting CF as a feasible alternative to overcome current problems. While appearing to deal with some issues, CF arrangements for this crop have a number of adverse factors as indicated. In Table 14 we discuss in some more detail the implications of these factors for policy making if this is to be a feasible alternative to IP arrangements in this sub-sector.

5.8.3. *Cashew Sub-sector*

Table 11 summarizes the influence of transaction cost factors on the cashew sub-sector. A key insight from this analysis is the critical importance to observed organizational forms (entirely IP) of the ability to export the raw cashew nut. This ability is driven by two factors. First, the very high value/weight ratio of the raw nut means that transport costs have less impact on the final price received. Second, the close proximity of India further reduces transport costs, and the high installed processing capacity and very low wage rates in that country create incentives to pay more competitive prices for the raw nut, especially early in Mozambique's harvest season, when nuts from India have not yet reached the processing plants. Ethnic ties between Mozambican traders and Indian buyers may also decrease the transaction costs of this trade. The result is that processors must compete with many potential local buyers for the raw nut, which substantially increases the risk to them of promoting production through contract farming arrangements.

This analysis is especially pertinent in light of the on-going controversy surrounding the GOM policy of charging excise taxes on the export of raw nuts. In fact, Parliament was unsuccessfully pressured to ban raw nuts exports. While such a step would seem to address a key factor we identify here as impeding the emergence of contract farming arrangements, it does not follow that such arrangements would automatically emerge if raw nut exports were banned.

5.8.4. *Cotton Sub-sector*

The analysis of this sub-sector is introduced in Table 12. This crop is generally grown in areas where cotton processing capacities are installed. The dependence of quality raw materials for processing that highly depend on the use of chemical inputs in a country that has high degree of market failure in both input and credit markets creates the need for some vertical coordination. Full vertical integration is not attractive because of the nature of the crop characterized by high labor intensity in production that significantly increases the supervision costs in a plantation context, and the lack economies of scale in production. Dispersed production is possible due to the relatively high value-weight ratio which reduces the impact of transport costs. The need for processing before final sale results in a limited number of buyers that makes CF feasible.

The organizational form that is predominantly observed is effectively contract farming. Some IP cases are also present. Although not strongly, some investors suggest IP and PA arrangements, but the analysis shows that without significant structural changes, neither is likely to be a feasible solution. In Table 14 we discuss in some more detail the implications of these factors for policy making.

5.8.5. *Sugar Sub-sector*

Table 13 presents a detailed analysis on how the different factors drive the choice of arrangement in the sugar sub-sector. This sub-sector requires high investment in agricultural equipment, especially irrigation, and use of large amounts of land in areas with abundant water resources and rail facilities. This makes dispersed production difficult. Moreover, needed economies of scale in production to assure scale compatibility with the processing stage, and the low value/weight ratio that makes transportation costs high, strongly favor vertical integration through plantation agriculture arrangements.

The principal observed form in Mozambique is indeed plantation agriculture in the central and southern parts of the country. Historically, that has been the predominant arrangement. Some isolated cases of arrangements with independent medium to large scale private farmers were identified in the south. Also, a ZAR⁶ 2.5 million ‘pilot project’ for a CF scheme, funded by the South African Government was launched in fields adjacent to a sugar company in the southern province of Maputo. That was a coordinated effort between the sugar company, the Mozambican Government through the FFHA (Fundo de Fomento da Hidraulica Agricola) and a local farmer Association. The results were encouraging indicating that, under certain circumstances, CF schemes in this sub-sector are potentially beneficial for all participants. In the next section, we discuss that in some more detail.

The finding that theory predicts well the observed arrangements in the various sub-sectors is not surprising. In a comprehensive review of empirical research in transaction costs economics, Klein (1995) observes that, taken as a whole, the body of empirical research in transaction cost economics shows that a good deal of economic activity aligns with transactions in a manner predicted by the theory.

⁶ ZAR=Rands - South African currency.

Table 10. Analysis of Maize Sub-Sector: Favored versus Observed Types of Agro-Industrial Investments

Factor	Is factor present?	Type of organizational form favored
Production characteristics		
High labor intensity	Yes. Labor is the key factor of production under the current technology for all phases from planting to harvesting. PA forms are supervision intensive since farmer incentives are limited to wage earning.	IP/CF
Economies of scale	No. Not under present technology.	IP/CF
High returns to inputs, complex management	No. Current returns with little use of chemical inputs and little management are highly variable. Returns to inputs can be increased without complex management. No pressing need for vertical coordination in this respect.	IP
Marketing/processing characteristics		
Economies of scale in processing	Yes, for mills producing refined meals for the mass market. This provides incentives to those mills for a more coordinated arrangement. However, under current wage rates and consumer preferences, small-scale hammer mills producing whole meal and slightly refined meal can compete effectively with large mills for a substantial portion of the consumer market. This makes it difficult for the large mills to pursue these more coordinated arrangements. On balance and in isolation, creates incentives for CF/PA by some companies.	CF/PA
High quality standards	Yes. Current marketing system does not stress quality nor pay premiums for it. However, returns to improved quality would be very high - processor prefer a more homogeneous product. Quality is affected by harvest- and post-harvest management. Therefore, more coordinated forms are favored.	CF/PA
High perishability	No. It is somewhat perishable especially if poor storage practices are followed. Minimum knowledge of conservation and storage techniques are sufficient to reduce risk of product loss in less coordinated systems such as IP.	IP
High value to weight/volume	No. Low value to weight and volume. This added to the fact that the product is not very perishable reduces the risk of high loss in farm-to-market transaction under IP arrangements. So IP arrangements are appropriate.	IP
Low value to weight/volume	Yes. So transport costs per unit of value are high, making dispersed production expensive.	PA
Principal market is export	No. There are some exports to neighboring countries but the product is predominantly consumed domestically by both domestic final consumers and domestic processors.	IP
Many potential buyers	Yes. The existence of many potential buyers (rural consumers, domestic traders, domestic processors, exporters/importers) and the fact that the product can be profitably sold without prior processing increases the risk of default for CF approaches that provide in-kind credit. This makes IP forms favored.	IP
Requires processing before final sale	No.	
“ <i>Sui generis</i> ” factors	This is a staple crop with demand and supply spread throughout the country. Risk of default in CF forms and the high likelihood of ‘thefts’ in PA forms, favor reliance on IP forms.	IP
Exogenous economic & political factors		
Land scarcity/high population density	No. Would make it possible to use PA forms if other factors were favorable.	PA
Agriculture has a large share of labor force	Yes. Mitigates against PA approaches, since households are very dependent on agriculture as a source of income.	IP/CF

Factor	Is factor present?	Type of organizational form favored
Endogenous economic & political factors		
Poorly integrated output markets	Yes. Although relatively more integrated than for many other crops, it is not really well integrated due to high transport costs and poor communications. This increases cost of product assembly in dispersed markets, favoring more coordinated approaches.	CF/PA
Missing input/factor markets	Yes. Input and credit markets extremely weak, leading to need for interlinked markets through CF arrangements, or internalization of transactions in PA.	CF/PA
Poor communications	Yes. Increases costs of coordination in CF approaches, especially monitoring of credit recovery and delivery of extension assistance.	IP/PA
Low literacy/educational levels among farmers	Yes. Increases costs of extension delivery/adoption of improved technologies, thus discouraging private sector investment in these activities through CF arrangements.	IP/PA
Weak property rights enforcement	Yes. Increases risk of default in interlinked credit and input markets as practiced in CF.	IP
Weak local government	Yes. When combined with weak property rights, this factor favors corner solutions that minimize risk - either IP or PA.	IP/PA
Theoretically Feasible forms	A simple count of favored organizational forms shows 13 favoring IP, 9 favoring PA, and 7 favoring CF, suggesting that IP arrangements are highly favored. The presence of many buyers and many consumers in this market, added to the possibility of local market and export sales without processing, dramatically increases the risk in CF and even PA arrangements and thereby precludes them.	IP
Observed Forms of Agro-Industrial Investments and suggested alternatives		
Primarily observed		IP
Other observed	PA , a few cases normally associated with livestock development and maize milling within a predominantly agricultural and/or livestock enterprise.	
Investors' suggested alternative		CF

IP=Processing with independent smallholder producers; CF=Processing with contract farming; PA=Processing with plantation agriculture

Table 11. Analysis of Cashew Sub-Sector: Favored versus Observed Types of Agro-Industrial Investments

Factor	Is factor present?	Type of organizational form favored
Production characteristics		
High labor intensity	No. Not as presently practiced by smallholders, BUT becomes more labor intensive if attempts are made to improve productivity (new plantings, PMD control). Harvesting is labor intensive under any technology.	IP/CF
Economies of scale	No. Not under present technology for PMD control and harvesting.	IP/CF
High returns to inputs, complex management	Yes. Current returns with little management are extremely low - returns can be increased substantially with new plantings and various approaches (including but not limited to chemical) to PMD control.	CF/PA
Marketing/processing characteristics		
Economies of scale in processing	No. Large factories located primarily in urban areas do have economies of scale, but under current wage rates, state of power supply, and labor relations, small-scale (and highly scalable) factories appear to have lower costs and higher quality.	IP/CF
High quality standards	Yes. Current marketing system does not stress quality nor pay premiums for it. However, returns to improved quality would be very high, because final market is highly quality differentiated. Quality is strongly affected by harvest- and post-harvest management, meaning that more coordinated forms are favored.	CF/PA
High perishability	No. Reduces risk of product loss in less coordinated systems such as IP.	IP
High value to weight/volume	Yes. Very high value to weight and volume. If the product were perishable, this would increase risk of high loss in farm-to-market transaction under IP arrangements and thus favor a more coordinated approach (CF or PA). But the product is not perishable, so this factor by itself has little influence over the organizational form governing transactions.	-----
Low value to weight/volume	No. So transport costs per unit of value are low, allowing dispersed production.	IP/CF
Principal market is export	Yes. Can be exported either processed or unprocessed. Either way, high returns to product quality mean potentially high returns to more effective coordination provided by CF or PA arrangements.	CF/PA
Many potential buyers	Yes. These factors interact with the very high value/weight ratio of cashew to be key determinants of the predominant type of observed organizational form. The high value/wt ratio allows the product to be profitably exported without processing, which opens the trade to many more potential buyers. The presence of these buyers increases the risk of default for CF approaches that provide in-kind credit. IP forms are thus favored.	IP
Requires processing before final sale	No.	
“ <i>Sui generis</i> ” factors	Close proximity to India reduces transport costs to that country. High installed capacity there, very low wage rates, and later start to harvest create strong incentive to import raw nuts for processing. Ethnic ties may facilitate this trade.	IP
Exogenous economic & political factors		
Land scarcity/high population density	No. Would make it possible to use PA forms if other factors were favorable.	PA
Agriculture has a large share of labor force	Yes. Mitigates against PA approaches, since households very dependent on agriculture as source of income.	IP/CF

Factor	Is factor present?	Type of organizational form favored
Endogenous economic & political factors		
Poorly integrated output markets	Yes. Related to high transport costs and poor communications. Increases cost of product assembly in dispersed markets, favoring more coordinated approaches. Yet high value/weight ratio mitigates against this.	CF/PA
Missing input/factor markets	Yes. Input and credit markets extremely weak, leading to need for interlinked markets through CF arrangements, or internalization of transactions in PA.	CF/PA
Poor communications	Yes. Increases costs of coordination in CF approaches, especially monitoring of credit recovery and delivery of extension assistance.	IP/PA
Low literacy/educational levels among farmers	Yes. Increases costs of extension delivery/adoption of improved technologies, thus discouraging private sector investment in these activities through CF arrangements.	IP/PA
Weak property rights enforcement	Yes. Increases risk of default in interlinked credit and input markets as practiced in CF.	IP
Weak local government	Yes. When combined with weak property rights, this factor favors corner solutions that minimize risk - either IP or PA.	IP/PA
Theoretically Feasible forms	A simple count of favored organizational forms shows 12 favoring IP, 10 favoring CF, and 9 favoring PA, suggesting that IP arrangements are slightly favored. In fact, IP is more strongly favored than this: the presence of many potential buyers, due to the possibility of export without processing, dramatically increases the risk in CF arrangements and thereby precludes them. Internal firm characteristics, including management approach, may also impede successful contract farming.	IP
Observed Forms of Agro-Industrial Investments and suggested alternatives		
Primarily observed		IP
Other observed	None , though there have been some attempts and continuing interest in PA arrangements	
Investors' suggested alternative		CF/PA

¹ IP=Processing with independent smallholder producers; CF=Processing with contract farming; PA=Processing with plantation agriculture

Table 12. Analysis of Cotton Sub-Sector: Favored versus Observed Types of Agro-Industrial Investments

Factor	Is factor present?	Type of organizational form favored
Production characteristics		
High labor intensity	Yes. Under the current technology, it is labor intensive. Supervision costs under PA likely very high due to moral hazard problems. It thus favors IP and to some extent CF if information problems can be minimized.	IP/CF
Economies of scale	No. Not under present technology.	IP/CF
High returns to inputs, complex management	Yes. Cotton production has potentially high returns to inputs and complex management. Sensitive detail and complexity in input use makes reliance in IP less favorable.	CF/PA
Marketing/processing characteristics		
Economies of scale in processing	Yes. Large economies of scale in existing gins and no competitive small-scale option.	CF/PA
High quality standards	Yes. Current marketing system does to some extent stress quality and pays premium for it. Returns to firms and farmers could be increased with further quality differentiation. Quality is strongly affected by how well and consistently production is managed. This favors more coordinated forms.	CF/PA
High perishability	No. Needs only to be kept dry. Reduces risk of product loss in less coordinated systems such as IP.	IP
High value to weight/volume	Yes. High value to weight and volume (though lower than cashew). If the product were perishable, this would increase risk of high loss in farm-to-market transaction under IP arrangements and thus favor a more coordinated approach (CF or PA). But the product is not perishable, so this factor by itself has little influence over the organizational form governing transactions.	-----
Low value to weight/volume	No. So transport costs per unit of value are low, allowing dispersed production.	IP/CF
Principal market is export	Yes. High returns to product quality mean potentially high returns to more effective coordination provided by CF or PA arrangements.	CF/PA
Many potential buyers	No. The presence of relatively few potential buyers and the need to process before final sale reduces the risk of default in CF and may rend PA arrangements appropriate. Without effective contract enforcement mechanisms in place CF can be jeopardized. However, in theory, these two factors favor some form of vertical coordination.	CF/PA
Requires processing before final sale	Yes.	
“ <i>Sui generis</i> ” factors	Dependence on quality output for processing that is highly dependent on use of chemical inputs in an environment where input markets are missing makes IP arrangements infeasible. PA could be considered but the labor intensive nature of the production process makes its labor supervision costs high.	CF
Exogenous economic & political factors		
Land scarcity/high population density	No. Would make it possible to use PA forms if other factors were favorable.	PA
Agriculture has a large share of labor force	Yes. Mitigates against PA approaches, since households very dependent on agriculture as source of income.	IP/CF

Factor	Is factor present?	Type of organizational form favored
Endogenous economic & political factors		
Poorly integrated output markets	Yes. Related to high transport costs and poor communications. Increases cost of product assembly in dispersed markets, favoring more coordinated approaches.	CF/PA
Missing input/factor markets	Yes. Input and credit markets extremely weak, leading to need for interlinked markets through CF arrangements, or internalization of transactions in PA.	CF/PA
Poor communications	Yes. Increases costs of coordination in CF approaches, especially monitoring of credit recovery and delivery of extension assistance.	IP/PA
Low literacy/educational levels among farmers	Yes. Increases costs of extension delivery/adoption of improved technologies, thus discouraging private sector investment in these activities through CF arrangements.	IP/PA
Weak property rights enforcement	Yes. Increases risk of default in interlinked credit and input markets as practiced in CF.	IP
Weak local government	Yes. When combined with weak property rights, this factor favors corner solutions that minimize risk - either IP or PA.	IP/PA
Theoretically Feasible forms	A simple count of favored organizational forms shows 12 favoring CF, 11 favoring PA, and 9 favoring IP, suggesting that CF is just slightly favored than the other forms. One can argue that CF is indeed more favored. IP can be generally disfavored because of the input and management intensity needed to assure a high quality product in the absence of well functioning input markets. CF appears superior to PA, due to the labor intensive nature of the production process that would make supervision costs under PA very high. Default associated with CF schemes can be minimized over time as the legal system improves.	CF
Observed Forms of Agro-Industrial Investments and suggested alternatives		
Primarily observed		CF
Other observed	IP. Generally supplying agro-industries predominantly engaged in CF with other groups of farmers. No PA cases reported.	
Investors' suggested alternative		IP/PA

¹ IP=Processing with independent smallholder producers; CF=Processing with contract farming; PA=Processing with plantation agriculture

Table 13. Analysis of Sugar Sub-Sector: Favored versus Observed Types of Agro-Industrial Investments

Factor	Is factor present?	Type of organizational form favored
Production characteristics		
High labor intensity	No. Capital using technologies are normally used throughout the production process except for some seasonal tasks.	CF/PA
Economies of scale	Yes. There are very high economies of scale in production.	PA
High returns to inputs, complex management	Yes. Appropriate and timely use of inputs and reliable irrigation is crucial in this production process. Returns with little management are likely to be very low. Therefore it favors more coordinated forms.	CF/PA
Marketing/processing characteristics		
Economies of scale in processing	Yes. Very high economies of scale in processing. Need for scale complementarity creates strong incentives for regular supply of product.	PA
High quality standards	Yes. Returns to improved quality are very high. Quality - consistent product standards - is strongly affected by the level of coordination and intensity of management in the production process. This means that more coordinated forms are favored.	CF/PA
High perishability	Yes. Sugar content falls very rapidly. That requires that the cane gets to the processing stage within a relatively small period of time. This means that more coordinated forms are favored.	CF/PA
High value to weight/volume	No. But risk of loss remains high due to rapid reduction in sugar content after harvest.	-
Low value to weight/volume	Yes. So transport costs per unit of value are high, making dispersed production expensive. Combined with perishability, this factors very strongly favors PA.	PA
Principal market is export	No. There are some exports to neighboring countries but the product is predominantly consumed domestically by both domestic final consumers and domestic processors.	IP
Many potential buyers	No. The presence of relatively few potential large-scale buyers and the need to process before final sale reduces the risk of default in CF.	CF
Requires processing before final sale	Yes. Without effective contract enforcement mechanisms in place CF can be jeopardized. However, in theory, these factors combined favor some form of vertical coordination.	
Exogenous economic & political factors		
Land scarcity/high population density	No. Would make it possible to use PA forms if other factors were favorable.	PA
Agriculture has a large share of labor force	Yes. Mitigates against PA approaches, since households are very dependent on agriculture as source of income and PA arrangements typically generate less farm employment and income than the others.	IP/CF

Factor	Is factor present?	Type of organizational form favored
Endogenous economic & political factors		
Poorly integrated output markets	Yes. Related to high transport costs and poor communications. Increases cost of product assembly in dispersed markets, favoring more coordinated approaches.	CF/PA
Missing input/factor markets	Yes. Input and credit markets extremely weak, leading to need for interlinked markers through CF arrangements, or internalization of transactions in PA.	CF/PA
Poor communications	Yes. Increases costs of coordination in CF approaches, especially monitoring of credit recovery and delivery of extension assistance.	IP/PA
Low literacy/educational levels among farmers	Yes. Increases costs of extension delivery/adoption of improved technologies, thus discouraging private sector investment in these activities through CF arrangements.	IP/PA
Weak property rights enforcement	Yes. Increases risk of default in interlinked credit and input markets as practiced in CF. Reduced security of land tenure acts against PA arrangements.	IP
Weak local government	Yes. When combined with weak property rights, this factor favors corner solutions that minimize risk - either IP or PA.	IP/PA
Theoretically Feasible forms	A simple count of favored organizational forms shows 13 favoring PA, 8 favoring CF, and 6 favoring IP, suggesting that PA arrangements are highly favored.	PA
Observed Forms of Agro-Industrial Investments and suggested alternatives		
Primarily observed		PA
Other observed	IP. Observed in the southern part of the country as an isolated case with larger scale independent producers, not smallholder farmers. A CF 'Pilot Project' was also tested with relative success in the south.	
Investors' suggested alternative		CF

¹ IP=Processing with independent smallholder producers; CF=Processing with contract farming; PA=Processing with plantation agriculture

5.9. Alternative Arrangements and Private and Public Sector Actions

No institutional arrangement is without problems, and most investors are constantly searching for ways to minimize problems and take better advantage of opportunities, in pursuit of increased profits. During the field work, investors were asked what alternative approaches they were considering, and most suggested concrete alternatives. The analysis presented in Table 14 indicates that, while some of problems that are identified with the existing primary arrangement may be eliminated with the alternative, many other problems are likely to emerge and the arrangements may or may not be desired on a poverty reduction standpoint. The bottom line is that to be effective, alternatives or a combination of arrangements can only be successful if appropriate policy and private/public investment actions are taken.

For each of the relevant crops, the analysis in this section identifies the problems reported by investors and those from the farmers' perspective under the current arrangements. Then, it examines the likely difficulties facing alternative arrangements under current conditions, the desirability of these arrangements from a poverty reduction viewpoint, and the prospects for

success for the arrangement. Finally some key actions needed by government and private sectors for the success of those alternatives are discussed.

5.9.1. Maize Sub-sector

Maize processing with reliance on independent producers (IP) as currently observed is well in line with the predictions based on the transaction costs approach. Essentially, for a staple crop that has demand and supply spread throughout the country, and is labor intensive in production, there is high risk of default in CF arrangements and high supervision costs in PA. IP is thus strongly favored. This arrangements has limitations, however, essentially related to price uncertainty and inconsistent quality and unstable supply, due to dispersed sources, that makes difficult for large-scale processors reach reasonable capacity utilization levels. Poverty reduction impacts are jeopardized by the rapidly changing market conditions and price uncertainty that, along with the limited bargaining power in the market and lack of reliable storage facilities, affect farmer profitability. Low productivity at the farm level is also a factor. The needed public sector investments include better roads and market information that can reduce uncertainty and transaction costs.

Moving to contract farming (CF), as suggested by some investors, to the extent it deals with some of the problems, is also desirable from a poverty reduction standpoint. The prospects for success are, however, poor at the present time. Under the current environment, a new set of problems may arise. First, unless productivity is raised, returns to farmers may be lower than the opportunity cost of farmer labor in alternative activities. Second, there is high risk of default due to many potential buyers and weak contract enforcement. Third, selective participation may leave out the poorest farmers. In this case, impacts on the poorest households will be limited to employment linkages, which generally do little to reduce poverty, and consumption linkages.

Private processing firms can potentially make CF schemes work if they successfully emphasize quality and pay a premium for it. Improved public grades and standards are necessary in this context. Other needed public interventions include the reinforcement of the legal system, facilitating the formation of farmer associations, and reinforcement of literacy programs in rural areas.

5.9.2. Cashew Sub-sector

The available export market for raw cashew nuts gives rise to many potential buyers that the local processors have to compete with. This is the driving force behind the predominance of the IP arrangement - CF arrangements have a high risk for default and to be successful require an intensive management approach. Under IP, the only organizational form currently observed, there are some problems faced by processors. The most pressing ones are competition faced with exporters, inconsistent quality and unstable supply to operate at capacity, high dispersion of sources, and lack of capital. From farmer's perspective, low productivity combined with price uncertainty makes cashew a potentially unreliable source of income. Farmer productivity is low due to lack of access to inputs for PMD control. The fact that no premium is paid for quality aggravates the situation. Although nuts' quality characteristics are mostly genetically controlled, controlling for PMD can help getting bigger and cleaner nuts. In that case, access to

PMD control inputs by farmers combined with a quality based pricing may lead to higher adoption rates and increased productivity.

Cashew processing in Mozambique is characterized by two very different technologies, with major implications for subsector organization: i) large-scale, capital intensive factories; and ii) smaller-scale, highly scalable, labor intensive units. The large-scale factories that came into production in the early 1990s (from a combination of rehabilitation of old factories and new investments) are characterized by high economies of scale and a generally lower quality processed nut quality than more labor intensive units. These large-scale units thus need a large and stable supply of raw nuts to keep their costs down. In Mozambique's current circumstances, farm level productivity is very low due to a combination of PMD infestation and high age of most trees. Even with the export tax on raw nuts, this low productivity has made it impossible for these factories to attain the scale they need to be profitable. Increasing productivity by providing sulphur to farmers for PMD control, and perhaps investing in new varietal development and dissemination, is very risky for these companies, for the reasons already discussed. Barring more ambitious government- and donor-financed programs to improve productivity, the future of these factories does not appear promising.⁷

The small-scale and scalable processing units that have emerged since the mid-1990s appear more suited to current conditions in Mozambique. Since they are less dependent on energy supplies than the large units, they can locate in rural areas where PMD is less of a problem and productivity is thus higher. The scalability of the technology means they can more easily match their capacity to available supplies and avoid the scale incompatibility problems that plague the large factories. Finally, effective management of these units will result in a higher quality nut, helping overcome some of the high costs imposed by Mozambique's poor infrastructure.

It is not clear, however, that even these investments will support CF arrangements, despite the suggestion by some investors that such arrangements held promise. Precisely because the small units can, within limits, adjust their scale to match available supplies, they face less incentive to invest in service provision on credit than do the large units. On the other hand, the smaller scale and rural location of the labor intensive units may decrease the monitoring costs of ensuring credit repayment if they do decide to provide selected services. If the PMD problem continues to worsen, some of these units may begin to do this, but it is likely to be small scale and limited in geographical scope. As long as the current government- and donor-financed spraying program continues, it is unlikely that any firms will find it in their interest to provide any services on credit themselves.

5.9.3. Cotton Sub-sector

Cotton under contract farming (CF) is driven by the fact that the crop is demanding in input use, but the system is characterized by credit and input market failure. Currently, it faces problems of default due to price competition between the regional monopsonies and some new buyers that take advantage of the weak legal system to buy from farmers to whom they have not provided services, and the lack of incentives that farmers have due to the monopsony power used by the

⁷ Some investment in sulphur provision has taken place, coordinated through the National Cashew Institute and implemented through cashew traders and others, but it is not clear that the scale is large enough yet to significantly affect national production.

cotton companies in negotiating prices. Room for interventions here are only in influencing the legal system and facilitating the empowerment of farmer associations to reduce their dependence on cotton companies and increase their negotiating power to allow for increased direct benefits. The alternatives appear to be even more difficult and not desirable from a poverty reduction standpoint. Using plantation agriculture (PA) as an alternative has problems related to labor intensity and lack of economies of scale in production that render that alternative highly infeasible and leaves little room for policy interventions. Relying on independent producers (IP) is not likely in the short run due to the specificity and complexity of production techniques and level of chemical input use.⁸ Over a longer term, appropriate interventions that revive input markets and appropriate widespread extension services and extension education in rural areas can help reduce the need for CF arrangements and increase the number of smallholders producing cotton as independent producers. Furthermore, investments in market information and physical infra-structure such as roads are a key ingredient to improve market efficiency.

5.9.4. Sugar Sub-sector

Sugar cane under plantation agriculture is the most convenient arrangement given the particular crop production and marketing characteristics. The problems with this type of arrangement are all related to the difficulty and high costs of expanding production to increase processing capacity utilization levels. There is not much room for government intervention in this regard apart from facilitating access to tracts of land and fiscal incentives on the form of reduction of duties on the import of equipment and production inputs, and temporary exemptions on income taxes. The suggested alternative of contract farming has the potential to increase production and processing capacity utilization, but brings additional challenges. The two major ones are the high specificity in production techniques that require high costs in extension and the high costs with investments in irrigation. These are two areas where the government could facilitate smallholder participation - and greater poverty reduction - by sharing the costs and risks with the private sector. Smallholder industrial sugar cane production has been successful in Kenya and Swaziland where smallholders have access to irrigable land near the refining factory. Collaboration with NGOs to defray extension costs would further increase the viability of smallholder sugar cane production.

Overall, on a policy standpoint, the challenge is in balancing the costs and benefits of policies and investments needed under the current arrangement with the private and public costs and benefits under alternative or combined arrangements. Considerations on growth, equity and sustainability of policy alternatives are key in this context.

⁸ The independent producers that exist are larger-scale commercial farmers. There is some prospect for growth in that segment, but it will not rival production from the family sector - in CF arrangements - for the foreseeable future.

Table 14. Reported Problems with Current and Alternative Choices and Key Private and Public Sector Actions

Current Arrangement				Suggested Alternative Arrangements				
Arrangement (Sub-Sector)	Key Factors Driving this Arrangement	Problems Reported by Investors	Problems from Farmers' Perspective	Alternative Arrangements	Adverse Factors in Implementing Suggested Alternatives	Desired from poverty reduction standpoint?	Prospects for success?	Key government/private sector actions needed
Processing with Independent Producers (IP) (Maize)	Many consumers process the grain at home or in local hammer mills, creating highly dispersed domestic market for final sale. This makes CF highly problematical due to credit default.	+ Price uncertainty + Inconsistent quality + Insufficient raw materials/low processing capacity utilization + Competition with other domestic users including direct household consumption + High dispersion of sources of raw materials	+ Because of uncertainty in market opportunities, price volatility, lack of bargaining power in the market and lack of reliable storage facilities farmers find it difficult to balance between food security and the profit motive.	Processing with Contract Farming (CF)	+ Returns to farmers may be lower than the opportunity cost of labor + Default due to many potential buyers + Problems of contract enforcement due to weak legal system + Low economies of scale if farmers are not organized in groups	Yes	Poor at the present time	A company successful in emphasizing quality and paying a premium for that quality could potentially make a CF scheme work. Improved public G&S would help. Quality protein maize (QPM) may improve prospects for success by supporting higher price, but there will be informational problems at the consumer and possibly processor levels, requiring effective government regulation, which is not likely to be forthcoming in near term.

Current Arrangement				Suggested Alternative Arrangements				
Arrangement (Sub-Sector)	Key Factors Driving this Arrangement	Problems Reported by Investors	Problems from Farmers' Perspective	Alternative Arrangements	Adverse Factors in Implementing Suggested Alternatives	Desired from poverty reduction standpoint?	Prospects for success?	Key government/private sector actions needed
Processing with Independent Producers (IP) (Cashew)	The available export market for unprocessed nuts gives rise to many potential buyers that the local processors have to compete with. This renders CF schemes difficult to implement because of the high risk of default. Also, current firms may not have a comparative advantage in the intensive management needed for successful CF scheme.	+ Price competition with exporters; + Inconsistent quality; + Lack of raw materials/low processing capacity use; + Lack of cash flow; + High dispersion of sources; + Missing input/factor markets.	+ Lack of access to inputs for PMD control reduces productivity and returns to labor; + Lack of negotiating power and price uncertainty makes it an unreliable source of income.	Processing with Contract Farming (CF)	+ Returns to farmers may be lower than the opportunity cost of labor; + Default due to price competition with exporters given the weak legal system to ensure contract enforcement; + High cost of extension and input delivery if farmers are not organized in groups; + Cost of procurement of new varieties and inputs; + Current firms may not have a comparative advantage in the intensive management needed for successful CF scheme.	Yes	Poor at the present time	+ For an effective CF scheme in cashew, firms need to be committed to an intensive management approach; + Firms need to be effectively engaged in promoting new plantings and control PMD; + Adopt decentralized smaller scale technologies that are scalable to farm level production capacity; + Continuing GOM support to research in PMD control and new varieties and extension; and + Effective GOM regulatory role to reduce risk of default.
				Processing with Plantation Agriculture (PA)	+ Problems with access to land with security of tenure close to processing unit; + Lack of excess farm labor for selected tasks; + High direct labor and supervision costs; + High risks associated with direct crop production.	No	N/A	N/A

Current Arrangement				Suggested Alternative Arrangements				
Arrangement (Sub-Sector)	Key Factors Driving this Arrangement	Problems Reported by Investors	Problems from Farmers' Perspective	Alternative Arrangements	Adverse Factors in Implementing Suggested Alternatives	Desired from poverty reduction standpoint?	Prospects for success?	Key government/private sector actions needed
Processing with Contract Farming (CF) (Cotton)	Credit and input market failure in combination with input needs of the crop create need for CF or PA arrangement. Labor intensity and lack of economies of scale in production preclude PA, while need for processing prior to final sale (resulting in limited number of buyers) makes CF feasible.	+ Default due to price competition among cotton companies + Default due to weak legal system + Lack of farmer incentives due to firm monopsony power + Information asymmetry and opportunistic behavior	+ High dependence on the cotton companies for input supply and lack of negotiating power leads to uncertainty regarding expected income from cotton production.	Processing with Plantation Agriculture (PA)	+ Difficult expansion to area cultivated close to processing unit + High direct labor costs, due to labor intensive nature of production + High labor supervision costs + High risks associated with direct crop production	No	N/A	N/A
				Processing with Independent Producers (IP)	+ Missing input/factor markets + High marketing costs + Poor market information and physical infra-structure + Inconsistent product quality + Price uncertainty	No	N/A	N/A

Current Arrangement				Suggested Alternative Arrangements				
Arrangement (Sub-Sector)	Key Factors Driving this Arrangement	Problems Reported by Investors	Problems from Farmers' Perspective	Alternative Arrangements	Adverse Factors in Implementing Suggested Alternatives	Desired from poverty reduction standpoint?	Prospects for success?	Key government/private sector actions needed
Processing with Plantation Agriculture (PA) (Sugar)	Economies of scale in production make PA feasible, while low value/weight ratio makes PA advantageous as way to reduce transport costs.	+ Low processing capacity utilization/ insufficient raw materials + Difficult expansion of area cultivated close to the fixed investments in irrigation + High capital costs in expanding production areas + High costs in production supervision + High risk associated with crop production	+ Relatively low employment generation due to the capital intensive nature of the production limits the direct impact on rural incomes that is limited to farm workers' wage.	Processing with Contract Farming (CF)	+ High specificity in production techniques that require high costs in extension + High costs with investments in irrigation	Yes	Possible	+ Success of CF in this sub-sector only possible if there is an effective partnership between GOM and the company in sharing the costs associated with increased smallholder participation. The company needs to make basic investment in irrigation (incentives to the company given by GOM if needed). It is in the companies interest to reduce extension costs and the GOM may participate with the provision of those services and in helping organizing farmers for an effective and well rewarded participation.

5.10. Investment Incentives and Business Environment

Throughout the field work information on the existing Government of Mozambique legislation regarding investment incentives was collected and discussions were held at various levels to have a sense of the nature and effectiveness of those incentives and perceptions of the private sector about the current business environment and some needed interventions. A detailed summary of those interventions is included in Annex 2 to this report. The following are some general considerations with respect to investment incentives and the businesses environment vis-a-vis rural poverty alleviation.

First, despite the fact that specific incentives are targeted to investments in rural areas and some special regimes are established for specific areas, such as the Zambezi River Valley, the current package of incentives to agro-industrial investments in Mozambique is not designed to specifically influence the way firms relate to smallholder farmers and target rural poverty.

Second, a significant part of investments with potential impact on rural poverty are existing businesses needing rehabilitation. Investment incentives, however, give clear preference to newly established businesses. This refers specifically to exemptions on import duties for equipment acquired abroad.

Third, there is considerable interest by private entrepreneurs to invest in rural areas and implement initiatives with a potential impact on the welfare of the rural population. However, problems with the basic public infrastructure such as roads, electricity and water resources, and the provision of appropriate extension services constrain the viability of those initiatives. Another serious problem has to do with excessive bureaucracy, especially related to the concession of land user rights to prospective investors.

There is a need for specific incentives to influence the way firms relate to smallholders. Beyond the general policy interventions, government needs to be sensitive to the details of proposed investment projects and practical about how to influence the type and location of investment to maximize poverty reduction effects. For instance, whenever possible, give preference to labor intensive as opposed to capital intensive technologies, rural over urban locations for the processing plants, and crops which can be produced by the smallholder sector.

Furthermore, items requested in the investment application package should include, in addition to considerations on the expected employment generated and the environmental impact assessment, considerations about the impact (direct and indirect) expected on smallholders and the mechanisms through which that will be achieved. The challenge is “what kinds of incentives? Probably additional fiscal incentives! How to monitor the effectiveness of the mechanisms presumably expected to affect rural poverty?”

Moreover, it is necessary to develop innovative analytical methods to evaluate investment's poverty alleviation impacts. A short-hand method using basic ratios that measure returns to investments, in terms of rural income generated, value exports and output, number of people directly and indirectly affected per dollar invested, can be created. Moreover, models capable of capturing spillover effects of production and consumption linkages (multiplier effects) can be used to help policy makers link incentives to the degree of return of investments with respect to poverty alleviation. Further research should be able to provide guidance on some of those issues.

Finally, a more aggressive public investment in infra-structure, or alternatively create the basic conditions and incentives for public/private sector initiatives (toll roads, etc) to accomplish that task in a sustainable manner. Spatial development initiatives can only be effective if that basic investment happens in those areas. Roads, water, electricity, and communications are key in this context . Otherwise, firms are not likely to respond to the current or further government incentives.

6. SUMMARY OF KEY CONCLUSIONS, POLICY IMPLICATIONS AND FURTHER RESEARCH

Poverty is a widespread problem in much of the developing world. Mozambique is no exception. Absolute poverty is more accentuated in rural areas where about 80% of the country's population live and work - poverty levels in these areas reach about 71%. Most of these people draw their incomes from agriculture and non-farm rural based activities that are strongly linked to agriculture. Rural agro-industrial development has a very high potential to help reducing rural poverty levels. The effects of particular agro-industries in a given region, however, can vary depending on how closely related they are to the rural poor, and, more specifically, the set of factors that condition that relationship, ranging from crop specific characteristics to the economic and political environment. Research efforts towards a better understanding of those relationships and the potential direct and indirect impacts on rural poverty to inform policy decisions are, therefore, very relevant.

This paper dealt with the issue of alternative institutional arrangements between agro-industrial investments and the smallholder sector in rural areas of Mozambique, and made a preliminary analysis on links to poverty reduction. It draws on a reconnaissance study undertaken in Mozambique in 2001.

Results indicate that, since the signature of the peace accord in 1992 and the subsequent first democratic elections in the country in 1994, there has been a significant inflow of capital to support investments in Mozambique. Some general and sub-sector specific patterns observed include:

- The value of agro-industrial investments represented, on average, almost 60% of all investments in rural based projects in the period 1985-mid 2001;
- The total value invested in agro-industry increased about 5 times from the period 1985-1990 to 1991-1996, from \$33.4 million to over \$161 million. Then it more than doubled from that period to 1997-2001;
- Over the entire period, the focus of investment has moved from cotton and tobacco (1985-1990) to a more balanced diversification of investments in sectors like maize, cotton, and cashew in the first half of the 1990's. More recently, since the late 1990's, there's been significant investments in the sugar sector, and some in tea as well. In fact, investment in tea alone during the final period exceeded all recorded agro-industrial investment during the first period.⁹
- There has been a recent emergence of investments by several tobacco companies in contract farming and processing operations in the center/north of the country, accompanied by a large increase in production from perhaps 1,000 metric tons in 1995 to an estimated 15,000 in 2001.

⁹ The investment recorded for the first period is extremely low. It is suggested that the instability in rural areas during the war led to that. Even if that is simply due to an undercounting of investments in that period, the basic pattern - strong increase and diversification in subsequent periods - is certainly still valid.

Current agro-industrial investments in the country demonstrate various degrees of connectedness with rural households. Those forms were summarized in this study in three different types: Buying from independent producers (IP); contract farming (CF); and plantation agriculture (PA).

Predominant sub-sectors identified in each type of arrangement were:

- Independent producers: cashew, maize and the emerging mango sub-sector;
- Contract farming: cotton, and tobacco growing areas;
- Plantation agriculture: sugar, tea, coconut, and citrus sub-sectors.

Between 1985 and mid-2001:

- About 45% of the total value invested went to agro-industries dealing IP, 32% for PA schemes and 23% for CF schemes;
- Average investments by agro-industries were \$3.8 million under IP arrangements, \$6.2 million under CF, and \$8.8 million under PA.

Investments in processing projects are predominantly geographically located as follows: Maize (Maputo, Nampula and Sofala), Sugar (Maputo and Sofala), Cotton (Nampula, Zambezia, and Cabo Delgado), Cashew (Nampula, Gaza/Inhambane and Maputo), and Tea (Zambezia).

Transaction costs economics, applied to the maize, sugar, cotton and cashew sub-sectors, was found to be helpful in predicting and explaining the predominance of particular organizational forms for these crops. This approach was also used to anticipate problems and strengths that may be associated with alternative organizational forms for the crops, and in identifying policy interventions to promote them in a sustainable way. On that basis, the study draws some implications for poverty reduction:

- Rural agro-industry can have direct and indirect effects on poverty. Direct effects come from wage employment of the rural poor in processing facilities, and from increased earnings to smallholders, who supply raw material to the processing firm. Indirect effects can be substantial, and come primarily from wage earners and smallholders re-spending their earnings in the rural economy. Much of this re-spending will be on items produced in the local non-farm economy, fueling its growth and increasing its contribution to poverty reduction.
- For either direct or indirect effects to be felt and sustained, the activities must be profitable for both the firm involved and also for rural residents.
- The relation between poverty alleviation and the institutional arrangements governing the relationship between farmers and agro-industrial firms is not linear and is likely to be commodity specific. However, two key facts can be referred to within the current context. First, due largely to information problems and to the failure of input and credit markets, spot markets (IP) are frequently unable to support high value crops in Mozambique. If smallholders are confined to low value crops, escaping poverty will be very difficult. Second, plantation agriculture (PA) generates only one direct effect on poverty - wages - and tends to use capital intensive technologies. It will therefore almost always generate less poverty reduction than will reasonably successful CF schemes.

- One challenge for policy makers is, therefore, to find ways to make contract-based relationships (CF) successful in both efficiency and equity grounds, i.e., financially attractive to firms while profitable for a reasonable number of small farmers.
- The characteristics of agro-industrialization with globalization, particularly more stringent quality and food safety standards, may make it difficult for small farmers and small agro-industrial firms to participate directly in the income growth that this process can unleash. The extent to which smaller farms and firms can participate directly, and the extent to which indirect effects are robust enough to generate substantial poverty reduction on their own, depends on many factors specific to the country and commodity in which the investment is taking place.

We draw some important implications for policy. First, many of the policies that will foster more direct participation of small farmers in the agro-industrialization process - and thus more poverty reduction - are steps that government should be supporting from any developmental perspective. These are improved roads and market information, improved rural education, removing legal barriers to the formation and development of producer associations, development in coordination with the private sector of workable grades and standards, and research on technology development and diffusion, especially improved seed varieties.

Second, beyond these general policy interventions, government needs to be sensitive to the details of proposed investment projects and practical about how to influence the type and location of investment to maximize poverty reduction effects. Whenever possible,

- favor labor intensive as opposed to capital intensive technologies,
- favor rural over urban locations for the processing plants, and
- favor crops which can be produced by the smallholder sector.

A good example in Mozambique is cashew processing, where labor intensive technologies located in production areas will have a greater impact on poverty reduction than will the more capital intensive Ultramer technology located in urban areas.

Sugar cane is predominantly produced under PA in most of the world, due to specific characteristics of the crop. Yet contract farming schemes involving large numbers of small farmers have been successful complements to estate production in countries like Kenya and Swaziland. Where feasible, government should consider strategic actions to facilitate smallholder access to irrigable land near sugar processing plants, and should also consider financing needed extension assistance to these farmers. If done in collaboration with sugar companies, such actions would create win-win situations for companies and farmers.

Tea is another crop which, while most often produced in plantations, also has a track record of successful smallholder production under contract farming arrangements. In Mozambique, most of the value of investment in tea has occurred under contract farming arrangements. Whenever possible, these arrangements should continue to be favored over plantation investments.

Maize is entirely organized under Independent Producer arrangements, and is unlikely to support contract farming in the short- and medium-terms. Improved grades and standards, if developed in consultation with private investors, would be a key contribution facilitating continued investment and greater value added.

Cotton is produced almost entirely under contract farming arrangements between large companies and small farmers and has been very successful in stimulating rural income growth and poverty reduction. Currently it faces serious problems in terms of the quality of assistance offered by companies. Government policy in this crop should focus on achieving a better balance between competition and coordination, in order to better safeguard the interests of farmers. Facilitation of the empowerment of farmer associations to reduce their dependency from cotton companies and increase their negotiating power to allow for increased direct benefits should be one key pillar in this effort.

The challenge is in balancing the costs and benefits of alternative policies and investments on efficiency and equity grounds, finding the right kind of incentives, and monitoring the effectiveness of the mechanisms expected to affect rural poverty. It would be very helpful to government, in the process of evaluating alternative investment proposals, if a short-hand method for predicting the investment's effects on poverty reduction could be developed.

Further research should be centered around a more in-depth and combined analysis between efficiency and equity of alternative forms, and considerations about the spill-over effects to effectively deal with the poverty reduction issue, and effectively inform the government to address policy options. The process has to include:

- The selection of specific sub-sectors and regions;
- Development of a better understanding of the economics of alternative institutional arrangements in those sub-sectors and regions;
- The use of regional impact analysis (Social Accounting Matrix/Computable General Equilibrium Models) at the village level to:
 - Measure the direct and indirect income effects that result from alternative arrangements in selected sites dominated by particular sub-sectors; and
 - Identify and simulate alternative policy interventions, aimed at strengthening firm-smallholder relationships, to assess the likely direct and indirect effects on poverty.

Using both qualitative and quantitative methods, that research should, therefore, be able to answer in more precise terms three sets of questions in the context of selected sub-sectors and selected geographic areas:

- What institutional arrangements between agro-industrial firms and rural smallholder producers may provide both efficient and equitable means of overcoming high transaction costs?
- What conditions are necessary for those institutional arrangements to operate efficiently while promoting a socially desirable distribution of income?; and
- What is the role of the government in helping those institutions - organizational forms - to succeed in achieving sustainable growth with equity?

The answers to this questions may help to address more effectively the practical details of policy making, including the design of incentive schemes to be provided by the Government to influence investors relationship with smallholder farmers. This research has to be capable of:

- Feeding an analysis of the cost-effectiveness of the Government's choices when providing incentives to investors; and

- Facilitating the development of analytical methods to evaluate an investment's potential poverty alleviation impacts including models capable of capturing the likely multiplier effects.

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ANNEX 1. LIST OF CONTACTS

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ANNEX 2. INCENTIVES AND BUSINESS ENVIRONMENT

This Annex reviews the set of incentives to investments currently in place in Mozambique. The details here are summarized from relevant GOM (Government of Mozambique) legislation. The points include are: I) Procedures for investing in Mozambique; II) Incentives and guarantees; III) Industrial free zones; and IV) Special regimes.

1. Procedures for Investing in Mozambique

- Arrange land and/or installations;
- Submit 3 copies of a project proposal to the CPI to get fiscal and customs incentives;
- Constitute/incorporate the implementing company at the Public Notary and publish its statutes in the *Boletim da Republica*;
- Register the company at the commercial registry and at the tax office of the headquarters or area of operations of the business;
- If applicable, complete land concession title and submit technical designs and environmental impact study for approval by the relevant ministries;
- Obtain the relevant business license (after technical inspection of the facilities) and start operations.

2. INVESTMENT INCENTIVES AND GUARANTEES

To benefit from the set of incentives presented here the minimum required amounts for investments are fixed at \$50,000 for foreign investment and \$ 5,000 for domestic investment.

2.1. Fiscal Incentives

2.1.1. Exemptions

- Import duties on equipment (class K of customs tariff), when these are to be used in **new enterprises**;
- Taxes on own capital or loans and interest, except for gains from the application of capital.

2.1.2. Reductions

- Industrial Contribution (income tax)

General

- 50% of the rate of the industrial contribution, during the period of investment recovery up to 10 years from the beginning of the operation;

Special Situations

- 80% reduction when implemented in Niassa, Cabo Delgado and Tete provinces, and 50% in the 6 years after the recovery period;
- 65% when the activities are implemented outside the provincial capitals;
- 40% after the normal period of tax benefits has expired, when the investment is made in Sofala, Manica, Zambezia and Nampula provinces;
- 25% for a period of 3 years after the normal period of tax benefits has expired, in the remaining provinces outside the capitals;

2.2. Complementary Tax

- 50% of the rate of the complementary tax during the period of investment recovery up to 10 years from the beginning of the operation;

2.3. Other reductions (firms in operation)

Other deductions (not specified) from taxable income are contemplated:

- Where the investment is in the rehabilitation and expansion of firms;
- Investment considered of public interest;
- acquisition of works of art or cultural objects and actions to develop national culture.

Investments in productive and public infra-structure exceeding \$ 500 million may have further benefits from special incentives (proposed by the Finance Minister to the Council of Ministers for approval).

3. INDUSTRIAL FREE ZONES (Zona Franca Industrial)

3.1. Definition

Refers to the area, unit or series of units of industrial activity geographically demarcated, that is a group of businesses located in an area where the goods imported are not considered to have entered the country's customs territory for the purposes of the duties and taxes that are payable. They also pay no income tax.

The Industrial Free Zone Regime applies to the 2 component parts of an Industrial Free Zone, namely:

- The development and operation of the industrial free zone infra-structure or estate (Industrial Free Zone Developer); and
- The operation of an export oriented manufacturing, processing or services enterprise within an IFZ.

3.2. Requirements.

The 2 essential requirements/characteristics to qualify for IFZ status are:

- Job creation for Mozambican nationals. Article 5 of the IFZ council charter and regulations says: "1. The authorization for the establishment of an IFZ is subject to the existence, in the IFZ overall, of at least 500 permanent employment positions for employees of Mozambican nationality, provided that each of the enterprises operating in the IFZ shall employ a minimum of 20 employees; 2. In the case of units or enterprises that wish to operate as an IFZ and enjoy the incentives provided under the Law 3/93 of June 24, the authorization is dependant on the existence of at least 250 permanent employment positions in each unit or enterprise for employees of Mozambican nationality."
- IFZ activities must export at least 85% of the production. Also allowed activities exclude exploration and extraction of natural resources, the processing of raw cashews and fish of national origin.

4. SPECIAL REGIMES

4.1. Zambezi River Valley

4.1.1. Geographical scope

- Tete province: All districts
- Zambezia province: Murrumbala, Mopeia, Chinde, Milange, Mocuba, Maganja da Costa, Nicoadala, Inhassunge and Quelimane districts
- Sofala Province: Gorongosa, Maringue, Chemba, Caia, Marromeu, Cheringoma and Muanza districts
- Manica Province: Barue, Guro, Tambara and Macossa districts.

4.1.2. Tax Regime

- Exemption from import duties on goods in Customs Tariff categories K, I and M when destined for new enterprises or the rehabilitation and expansion of existing enterprises;
- Exemption from business income tax until 2025 for activities in agricultural, livestock, forestry (silviculture) and hydroponics;
- Exemption from Industrial contribution for 5 tax years;
- 80% reduction in tax from the 6th year onwards;
- Exemption from 18% of the complementary tax on dividends and loan interest;
- Exemption from 15% withholding tax on payments to non-resident sub-contractors;
- Exemption from Real Property Transfer Tax (SISA).

4.1.3. Eligible Activities

Agriculture, forestry (silviculture and logging), hydroponics, wildlife management, water supply, electricity generation, transmission and distribution, telecommunications, civil construction and public works, manufacturing and industry, banking and insurance.

4.2. Special Regime for the Sugar Industry

For a period of 5 years, starting in October 1999, the sugar industry benefits from a special regime (see details under the approved decree). Some key points are:

- Full exemption from customs duties and other applicable taxes on:
- Equipment to carry out the project feasibility study and investment project implementation;
- building material and equipment necessary to carry out an approved investment project;
- passenger cars for the company, provided that the value does not exceed 1% of the total value of the project;
- Raw materials, intermediate products and packaging materials used for production are only exempted for the first production cycle;
- Exemption from customs duties on foreign investors' and expatriate technical staff's personal belongings.

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