Chapter Seven: A Model to Link Small-Scale Farms with Agribusiness

7.1 Introduction

In the context of the case studies reviewed earlier, the objective of this chapter is to develop a model to assist the design of agribusiness-smallholder contractual relations The development of a proposed model is a response to the need to expand small-holder agribusiness contracting arrangements that are able to prevent exploitation, manage the relationships between the parties, prevent shirking and opportunism and to configure agribusiness and farmers with international quality requirements The development of the proposed model embraces the lessons of Chapter Two, the conceptual developments of Chapter Four and the case studies as outlined in Chapter Five and Six. Although the proposed model has been developed on the basis of the results of the case studies, it has been structured in such a way that it can be adapted to the supply of other commodities. A specific feature of the model, moreover, is that it incorporates costing-software systems that can identify the differential cost to agribusiness of contracting with different types of farmers and commodities The outline of the chapter commences with a discussion of design in relation to the complex nature of the firm before developing a series of proposals. A proposed model is then constructed before a summary and conclusion is developed

7.2 The Design of Management Control Systems

Despite recent developments in economic and strategic management theory, a number of factors contribute to the difficulties of designing firm level structures and controls Despite progress towards understanding the firm, they are still not fully understood because of their complex nature. Organisations are complex because they are systems that recognise more than one ultimate principal and corporate situations are often simultaneously social and economic (Barney & Ouchi, 1988; Williamson, 2000) The design of organisation structures incorporates a control motive, as well as a need to provide decision-making, performance evaluation and reward structures (Walker, 1998; Dietrich, 2001). The design of structures and control systems is better able to reflect the emergence, size and performance of the organisation, if a the ry of the firm approach is adopted (Groenewegen & Vromen, 1996, Pitelis 1) (Williams n

1996;2000); Walker, 1998; Dietrich, 2001). The emergence of organisational economics has been matched with a realisation of the importance of organisational structure in modern agricultural supply chains that are increasingly reflecting the need for tighter levels of alignment (Barry et al, 1992; Royer, 1995; Pasour, 1998, Brickley et al, 2001). Furthermore, the major theoretical developments of the firm have provided an ideal opportunity to apply new approaches to understanding and evaluating the managerial and organisational environment of many industries undergoing structural change (Barry et al, 1992). Finally, an understanding of the economics of the firm is especially important in the currently changing environment, that has witnessed dramatic changes in information technology, more competitive markets, changing organisation structures and new management practices (Burns and Scapens, 2000).

The design of structures and control systems is influenced by the physical production processes of the firm and the non-accounting systems that track resource flows and their related transactions. Design is influenced by both production-distribution technologies, the output market, the level of competition (Drury & Tyles, 1998), production complexity, the product mix, the level of indirect cost, the level of tracking required to monitor resources, the frequency of reporting and the lag between actual and reported events (Karmaker et al, 1990). The level of competition has also been directly linked to the emergence of more sophisticated control systems as a result of the higher levels of price sensitivity, shorter product life cycles, higher levels of cost competition and the presence of substitute products (Mia & Clarke, 1999) Organisations that pursue a confrontational strategy, need to adopt more comprehensive control systems to produce new products more rapidly and make their products more economically in smaller batch sizes. This type of firm often requires a close relationship with suppliers and inter-organisation control systems are essential to capture co-operative economies of scale (Cooper, 1996). Finally, the design of modern control systems has been profoundly influenced by developments in information technology that underwrite most activities and are a key component of strategy (Karmaker et al, 1990; Christiansen & Mouritsen, 1996).

7.3 The International Experience: Suggested Solutions

The economics of contracting would suggest, in many instances, that there is no particular reason for the integrator to choose small-scale suppliers over larger growers if all the contracted parties are paid the same price and deliver the same level of quality. This being the case, it is necessary for agribusiness to take specific steps to either avoid the cost or, alternatively, charge back the differential cost to the respective contracted farmer.

A series of general proposals can be developed on the basis of the experience of smallholder contracting. These lessons include the importance of screening future partners, the need to understand how historical and institutional legacies have influenced contracting arrangements and the advantages of creating mutual asset specificity between the contracting parties. Additional lessons include the important role of logistics, the need to carefully assess start-up cost, the need to invest in smallholder partners and promote access to facilities, the importance of commodity characteristics and the implication of contracting with large numbers of small-scale farmers. Other important lessons include the presence of a competitive fresh market, the role of the state, the role of trust-contract conflict, property rights economics, the strength of agribusiness management, the volatility of world prices and the important role of women. Kirsten and Sartorius (2002) suggest that these problems, and their suggested solutions, can largely be summarised as follows:

- High levels of transaction cost
- The difficulties of contract enforcement

7.3.1 Transaction Costs

The international experience, in line with the case studies, demonstrates that contracting with large numbers of small-scale suppliers has been associated with higher levels of transaction cost (Runsten & Key, 1996, Rehber, 1998, Key & Runsten, 1999). Sappi Limited, for instance, has invested ten years and R 10 million to establish small-scale tree farming in Kwazulu-Natal The Transvaal Sugar

Company in Mpumalanga incurs an annual cost of in excess of R3 million to ensure the viability of small-scale supply, whilst the Mhlume Sugar Company and the Swaziland Government incurred a cost of R600 000 over three years to establish a fifty family farmers' association.

The transaction costs of small-scale suppliers in the case studies clearly exceeded those of larger suppliers. Transaction cost can be reduced by a careful analysis of start-up costs, an understanding of how historical legacies influence transaction cost, an understanding of the relationship between commodity characteristics and transaction cost, the development of mutual asset specificity and the use of farmers associations.

Start-up Cost

The careful assessment and treatment of start-up cost is a key project evaluation procedure. In many instances, agribusiness must commit long term resources to establish small-scale farmer projects. Start-up cost will, generally, be higher if non traditional crops are being introduced, because of the need to train farmers and introduce complex technology. The start-up cost, moreover, can include the linking of small-scale farmers to institutions like banks, insurance companies and suppliers The lack of access to these facilities, in conjunction with infrastructure deficiencies, has been cited as a prime cause of project failure (Gittinger, 1982) This study proposes that the incidence of small-holder contracting in South Africa will be negatively influenced if agribusiness is expected to bear the full cost of start-up The assessment of start-up cost, therefore, should form the basis of lobbying for government subsidy-relief or alternatively to charge back this amount to the farmers If the contracted farmers are unable to amortize start-up cost, the viability of the operation should be questioned from the outset.

The careful screening-identification of future partners is a key success factor Farmers who have a record of previous interaction with agribusiness, appear to be more successful contracting partners (Levin, 1988; Porter & Phillips-Howard, 1997a, 1997b). The three case studies all appear to have developed a data bank of farmer details for each prospective new farmer. In the case of the sugar industry, the

screening process took more cognisance of the entrepreneurial ability of the prospective applicant, whereas, in the timber industry, it would appear as if a majority of applicants were accepted. Screening costs, involving large numbers of applicants, can be significantly reduced if these activities are assisted by a representative farmers' association or if agribusiness contracts with the farmers' association, rather than the individual farmer. The benefits of screening can be increased if the process includes a business aptitude test, a credit check and a list of assets-collateral The screening process could also capture the location, logistics and communication channels of the applicant in order to ascertain the spatial dynamics of the project.

The design of the logistics of small-scale farm supply is a crucial success factor The timber case study illustrates the increased level of transaction cost generated by large numbers of small-scale farmers that are spatially dispersed. Agribusiness, at the outset, can evaluate the transaction frequency of visits, inputs and farmer deliveries with the distances involved, the nature of the roads and the available communication system. The transaction cost of logistics can be fundamentally reduced by allowing a farmers association to provide the necessary inputs, as well as organise the logistics of small-scale supply. The timber case study suggests Sappi Forest should contract with a farmers association for an aggregated monthly volume of timber instead of contracting individually with the 7 100 micro farmers. In the absence of a farmers association, agribusiness can improve efficiency by establishing the suitability of the roads, access and communication systems of the proposed project The timber case study indicated that certain areas were impassable in the wet season and that declining levels of rural security and high levels of ethnic conflict have resulted in a lack of access, except for local community members. Finally, the agribusiness company can assemble and program the transaction cost of logistics by capturing the spatial dispersion of the farmers, the number of transactions and the average distance to the processor.

Historical Legacies

An understanding of the historical legacies and institutional environment will contribute towards a better understanding of the future transaction cost of contracting with large numbers of small-scale farmers Transaction cost theory suggests that the

transaction characteristics of agricultural supply chains are a function of a range of historical-social variables. The case studies debate the pervasive long term influence of historical legacies on economic performance. The legacies that have influenced transaction cost include culture, the historic concentration of industry, the influence on property rights economics, the level of regulation and the concentration of political power. It is suggested, therefore, that the design of contracting structures incorporates an understanding of how historical legacies influence transaction cost. Appropriate design measures can then be taken to reduce transaction cost in two ways Firstly, many industries have the power to lobby for changes in the institutional framework and Williamson (2000) suggests that this form of economising can significantly reduce transaction cost. South African agribusiness, because of its important role in the economy. can attempt to lobby for property rights amendments and some form of subsidy-tax relief for undertaking smallholder start-up costs. Secondly, the design of organisation structures can be undertaken more efficiently if an understanding of the dynamics of transaction characteristics is incorporated.

Commodity Characteristics

Certain commodity characteristics are better suited to contracting. Crops, in particular, that are labour intensive in the growing operation and display economies of scale in processing, are more suited to smallholder contracting (Delgado, 1999) The case studies in the sugar and timber industries did not demonstrate particular growing economies for smallholder family labour, yet these growers, mostly matched larger growers with respect to the cost efficiency of production. The reason for this ability to compete with larger growers appears to stem from the avoidance of overhead cost rather than the productivity of family labour. The results of the case studies suggest that smallholders may be able to compete as growers with commodities that are not particularly labour intensive, thus further relaxing the suggested product range of Delgado (1999). Commodity characteristics can also be linked to transaction cost for design purposes. Commodities that are perishable will require higher levels of co-ordination cost than those that can be stockpiled. Alternatively, commodities that have long growing periods may require a different contract structure from annual or shorter term crops. Growers in the timber industry sometimes receive advances for work performed against the sale of the future crop The design of contracting structures can

thus consider developing a commodity characteristics profile and use this, together with processing capacity, as the basis for determining the transaction characteristics of frequency, asset specificity and uncertainty to determine an optimum structure Finally, the inappropriate choice of technology, a function of the commodity characteristics, has been cited as a cause of project failure (Gittinger, 1982) Finally, agribusiness often has a choice of technology alternatives and it has been suggested that if a labour intensive option does not detract from performance, this option could be chosen to better suit the competencies of the developing country farm family

Mutual Asset Specificity

The creation of mutual asset specificity reduces uncertainty and raises the exit costs of both sets of contracting partners. The case studies in the sugar and timber industries indicate that the agribusiness partner is confronted with significantly higher levels of asset specificity than the contracted farmers. The industry and site specific processing assets, in the sugar and timber case studies, were valued at R 2-2 3 billion and R 5 billion respectively. Conversely, the contracted farmers owned fewer assets that were of a more general nature. The South African sugar firm, TSB, has a very high level f asset specificity and relies on contracted out-growers for 80 % of sugarcane supply Transaction cost theory would suggest that a higher level of managed co-ordination is needed in the absence of inducing higher levels of mutual asset specificity or other interlocking factors. Mutual asset specificity can be pursued by way of farmers' associations undertaking the purchase of industry specific capital inputs The Swaziland sugar farmers' associations appear to have increased mutual asset specificity by investing in sugar specific plant and equipment that are too lumpy f r the individual farmer. Agribusiness can attempt to act as a facilitator of finance, n this regard, to increase the interlocking nature of the arrangement Agribusiness can examine other ways of influencing mutual asset specificity by way of configuring the technology of the grower-processor operations in such a way that only the company possesses the technology to perform a specific element of the growing operati n Contracted growers, for instance in the processed tomato sector, require specif c harvesting technology that is often owned and operated by agribusiness (Rehber 1998).

Farmers' Associations

The problems of smallholder representation and high transaction cost can be addressed by organising a farmers association to undertake the administration of its members interests. The farmer association can be responsible for configuring its members with the contractual arrangements of supply. The farmer association could also be used as a way to deliver agribusiness quality requirements and inputs including training, extension, technology acquisition, the provision of commodity inputs and the co-ordinating of harvesting-delivery schedules. A farmers association can result in lower screening costs, reduced transaction frequency and facilitate the purchase of lumpy capital inputs. Agribusiness can increase the successful operation of the farmers' association by acquiring representation in the management structure, as well as allowing the association to be represented in its own management structure Swaziland farmers associations in the sugar industry, for instance, are represented in the factory cane supply committee. Agribusiness, moreover, can further influence the efficiency of the farmers association by ensuring this body maintains records, has no political agenda, is limited in size and contains sufficient professional management

7.3.2 Contract Enforcement

The economics of property rights and contract enforcement are an important success factor with respect to small-scale farmer contracting. In many instances, contract enforcement is difficult to ensure through the legal process and the logic of contracting with large numbers of small-holders is a questionable issue (Runsten & Key, 1996; Rehber, 1998; Sofranko et al, 2000). Williamson (2000) suggests that the firm can attempt to favourably influence the prevailing institutional environment in order to improve the economics of property rights. South African agribusiness has the potential to influence legislation that includes land tenure, the water act, the role of tribal authorities, the labour act, the rights of the female farmer, the national heritage acts and the conservation laws. The timber case study is an example of legislation that substantially complicates contract enforcement and increases transaction cost by way of a plethora of acts and legislation that must be complied with in order to register a new grower.

A number of steps can be taken to facilitate contract enforcement, including ensuring that the presence of competitive fresh market does not disrupt supply, contracting with a farmer association, the use of contract innovations and the development of trust in contractual relations.

Competitive Fresh Markets

The history of contracting demonstrates that the presence of a competitive fresh market for grower outlets increases the level of uncertainty of supply. Transaction cost theory explains the increased level of cost to the integrator in terms of higher levels of opportunism by the grower. The occasional opportunistic sale of timber in rural Kwazulu-Natal highlights this problem, that was well documented in the Mexican tomato growing sector (Runsten & Key, 1996). The unauthorised sale of the contracted commodity can be especially problematic in the case of projects involving large numbers of small-holders in developing countries with poorly regulated property rights economics. The company, in this type of scenario, may not be able to legally enforce the contract because of the incremental cost of dealing through an inefficient system and the micro nature of the contract. Agribusiness can reduce unauthorised sales by securing an agreement with competitors with regard to the purchase of the commodity. Finally, the chances of contract enforcement are improved if market based prices are paid for the raw commodity or, alternatively agribusiness could locate outside the area of the competitive fresh market.

Contract Innovations and Trust

The representation of farmers' interests by way of a farmers' association can improve contract enforcement (Little & Watts, 1994). Agribusiness can also employ tribal authorities to enforce the contractual conditions. The logic of attempting to legally enforce a set of contract conditions, with respect to a farmer on less than a hectare of communal tenure land, as was the case in the timber study, is questionable.

The use of a renewable contract is suggested as a cost effective way to achieve enforcement (Key & Runsten, 1999). The Swaziland sugar case study indicates that the company renews supplier contracts on an annual basis. If suppliers have not

performed in the previous year, their contracts are simply not renewed the following year. Conversely, the processor in the timber case study appeared to pursue contract enforcement by way of registering a timber servitude or bond. Gow et al (2000) have demonstrated that contract innovations, or interlocking factors, can contribute towards improved contract enforcement. These factors include the administration of growers' affairs, the company acting as banker, the supply of inputs and high levels of involvement in local communities. The timber industry case study demonstrates the interlocking nature of a contract that provides financial assistance and or part payment for certain phases in the growing process. Colchao (1999) suggests agribusiness can successfully induce contract enforcement by acting as a banker to the contracted farmer. Agribusiness is able to compete in the banking sector as a result of better information, combined with the ability to enforce contracts in alternate ways. The company could attempt to own-control the assets and technology of the grower and play a role in the financing of these assets (Colchao, 1999). The timber case study, moreover, suggested that the smallholder management company, LIMA, has effectively become a high cost interlocking mechanism because it is so integrated in the everyday affairs of contracted growers. The company not only manages the entire spectrum of smallholder activities, but also administers their financial affairs. LIMA also acts as an intermediary banker by facilitating and administrating SAPPI loans and advances, at subsidised interest rates, by way of a loan repayment scheme that operates through the company's debtors system. The sugar case studies also suggested high levels of agribusiness investment in local communities, including housing projects, medical services and schooling facilities. The contracted growers had access to a range of interest free inputs and services and termination of the grower contract would imply a loss of all these facilities to not only the contracted farmer, but their dependants as well.

Fafchamps and Minten (1999) suggest that trust based relationships can be a dominant interlocking factor that can contribute to contract enforcement. Transaction cost theory suggests that trust influences uncertainty as a result of its effect on the opportunistic behaviour of the contracting parties. Farmer distrust, combined with a perceived loss of autonomy and feelings of exploitation, has been widely cited as a major cause of contracting failures in developing countries (Glover, 1987, Clapp, 1994; Watts, 1994). It has been suggested that the success of future South African

contracting arrangements will be influenced by the level of trust that can be engendered between the parties. The development of trust is especially important given South Africa's history of colonialism and apartheid (Porter & Phillips-Howard, 1997a; 1997b). Trust has been demonstrated to reduce transaction cost in the South African beverage industry (Tregurtha & Vink, 1999) and the Swaziland sugar case study indicates that a reasonable level of trust has reduced contract conflict and transaction cost. Trust can be quantitatively measured using a field survey technique This technique, employed in the Swaziland sugar case study, involved a quantitative survey to evaluate the level of farmer satisfaction and trust. Trust can also be built by ensuring that company interface officers are local and that grower information is conveyed in the local language of the community (Porter & Phillips-Howard, 1997a 1997b). Trust can be further improved by developing grower representation in all stages of the decision making process (Delgado, 1999). The company can also ensure that the provision of inputs and technical advice is seen as advice rather than supervision. The sugar industry case studies indicate that both Transvaal Sugar Company and Mhlume Sugar (Swaziland) carefully accord the necessary level of respect-advice to growers and see them as business partners. These companies have embarked on a long term program to build social capital in the form of developing independent entrepreneurs, by providing facilities and education on the assumption that higher levels of efficiency and trust can be inculcated to ensure contract enforcement, as well as reduce cost. Conversely, the timber case study indicates higher levels of agribusiness paternalism and hands on management

7.3.3 Miscellaneous

The grower response to raw commodity prices and other opportunities is suggested as a key long term issue that can influence the stability of the contracting arrangements A long term perspective on prices could contribute to locking contracted growers into a commodity and ensuring continuity of supply in depressed conditions (Levin, 1988 Watts, 1994; Abbott, 1994). The Swaziland sugar case study indicated that, although growers largely trusted the company, they were not entirely happy with the price paid for sugarcane. The current volatility of world sugar markets, combined with the increasing threat of oversupply, suggest increased pressure on grower prices The agribusiness company may be forced to maintain-increase prices t ensure supplies

are maintained in an industry where the profits are largely secured in the processing operations. An unfriendly policy environment influencing prices has been cited as a cause of project failure (Gittinger, 1982) and, again, South African agribusiness can attempt to lobby for favourable agricultural, fiscal and monetary policy

A number of other issues influence the success of small-holder contracting schemes These issues include the role of female farmers, the control of land and water, the role of the state, the household food security issue and land degradation The role of the female farmer is especially important in many developing country contracting arrangements. Carney (1988) and Gittinger (1982) suggest that a failure to understand the social environment is a prime cause of project failure. The case studies in the sugar and timber industries suggest high levels of labour inputs are supplied by female household members. Agribusiness in South Africa can contribute towards the future role of the female farmer, by securing legislation that ensures full representation-rights for the female farmer in communal tenure areas It is also suggested that agribusiness payment for the commodity should be directed to the household member responsible for supply.

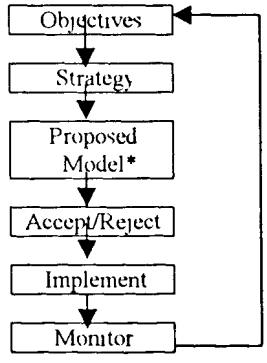
The role of tribal authorities in communal areas will also need to be confi ured t promoting gender access in rural areas. The issue of who controls land and water in the contract relationship can influence the success of the arrangement If the land and water are owned by the contracted growers, the decision making autonomy of the farmer is not affected, however, if they are owned by the company, the conditions of use should be mutually developed and fully understood by both parties Another key issue is the role of the state. In many developing countries the state has been an active partner of small-scale contracting projects. In the Swaziland sugar industry, for instance, the monarchy holds a fifty percent interest in the Mhlume Sugar Company It has been suggested that if the state is a partner, it should provide some f rm of financial assistance. The equity objectives of the state can also be investigated with respect to their impact on economic performance The Swaziland sugar case study indicates that the equity objectives of the Commonwealth Development Corp rati n and the monarchy have contributed towards the establishment of a village, medical facilities and a sc ool. Finally, the issue of food security and land de rada n can influence the long term viability of contracting arrangements Mon -culture

contracting has been associated with a reduction in food crops and an increase in pollution (Rehber, 1998; Pasour, 1998, Wolz et al, 1999) Agribusiness can respond t these threats by encouraging farmers to grow food crops on a percentage of their land and pro-actively investigating the long term threat of growing technologies on sustainable land use.

7.4. The Proposed Model

The proposed small-scale farmer contracting model-project can be viewed as a long term investment decision that forms part of the strategic process The strategic process, illustrated in Figure 7.1, is a dynamic continuum that ensures the objectives of the firm are translated into long term strategy which then forms the basis of the short term plans. These plans are implemented in the form of budgets and monitored by way of performance reporting to ensure the firm's objectives are being pursued (Porter, 1986; Drury, 1996; Horngren et al, 1999; Kaplan & Atkinson, 2001)

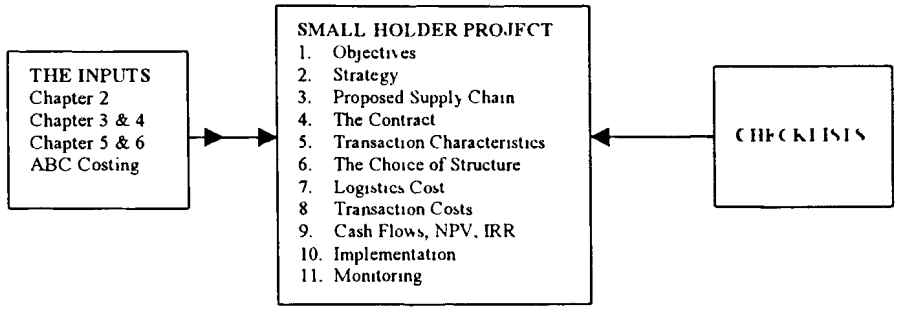
Figure 7.1 The Strategic Process



The design of the proposed small-holder contracting model, illustrated in Figure 7 2, has accommodated the use of the conceptual framework developed in Chapter Four with the need to address the complex nature of design discussed in Section 7 2, as well as the proposals based on the case studies and the international experience listed in Section 7.3. The proposed model consists of the objectives of the smallholder contracting project, the configuration of the project in company strategy, the details of the grower-processor supply chain, the contract-transaction characteristics of the

supply operations and the selection of the optimum governance structure Further features of the model include the cost of logistics, the transaction cost and the aggregated project cash flows that are required to make the final investment decision Finally, the proposed model discusses the implementation and monitoring of the project. A series of checklists are included at each stage of the design process, to ensure that the inputs have been effectively integrated into the proposed model

Figure 7.2 The Proposed Model*



7.4.1 ABC Costing

The model proposes the use of an activity based costing system (ABC) to identify and differentiate transactions. ABC systems are designed on the premise that the firm's activities consume resources and that the operation of the firm can be broken down into a series of activities called cost pools For each cost pool the total cost at a normal level of activity is determined, a cost driver is selected and the total number of transactions of this cost driver estimated. The total cost is then divided by the total number of transactions, to determine a transaction rate which can then be traced to the relevant cost object (Drury, 1996; Kaplan & Atkinson, 1998, Horngren et al, 1999)

7.4.2 The Objectives

The objectives of the proposed contracting project need to be clearly articulated and configured with the mission statement and objectives of agribusiness The project objectives can be focused on economic criteria, equity criteria or include a combination of both (Porter, 1986, Drury, 1996, Horngren et al, Kaplan &

Atkinson, 2001). In a majority of smallholder projects there is a balance of profit versus social objectives (Little, 1994; Eicher & Staatz, 1998) In the case of economic objectives, the firm would normally insist on projects that increase shareholder wealth as measured by economic value added, residual income or a positive net present value of project cash flows. Equity objectives can also be clearly articulated in terms of the type of benefit derived from the project, including social welfare and political economy outcomes. The articulation of equity objectives can, furthermore, form the basis of an approach to the state or a donor body for development aid or assistance-relief in some form. The role of government can be configured into agribusiness objectives in order to create an investor friendly environment that ensures a healthy relationship between agribusiness investment, social objectives and economic return The role-objectives of government can also be used as a basis to create public private partnerships.

7.4.3 The Strategy

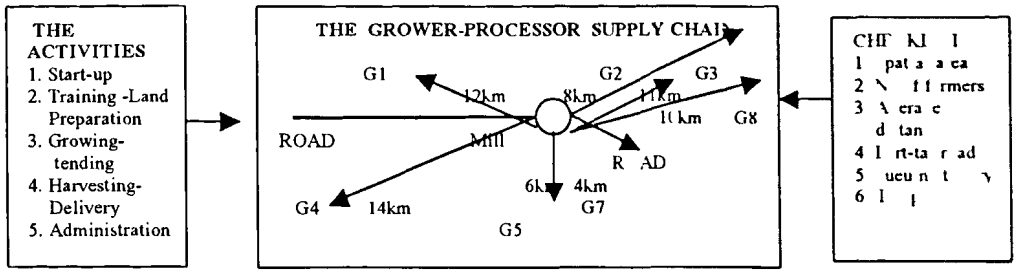
The strategy of the firm is based on the long term plans that hope to achieve the articulated objectives. The proposed contracting model, as a long term investment decision, must be configured with the firm strategy. Firm strategy normally incorporates some form of growth to increase shareholder wealth. Growth strategies incorporate make or buy decisions. If the firm has superior competencies, it may choose the self manufacture route. Conversely, if outside suppliers can provide the goods and services at lower cost, the firm may decide to buy (Porter, 1986, Merchant, 1998; Anthony & Govindrajan, 2001). The choice of acquiring an agricultural commodity from a small-scale contracting project can be questioned as follows Firstly, can the firm grow the commodity at less cost ? If not, can the firm acquire the commodity from an alternate source at lower cost' If the firm can acquire the commodity at less cost elsewhere, then the equity benefits of the small-scale contracting option should exceed the incremental cost

7.4.4. The Grower-Processor Supply Chain: Activities and Logistics

The proposed contracting model can be represented in terms of a grower-processor supply chain illustrated in Figure 7.3. The activities co-ordinated by the grower-

processor supply chain include the start-up phase activities, the planting-growing activities, the harvesting-delivery activities and the administration of commodity supply. The supply chain can be represented as follows

Figure 7.3 The Grower-Processor Value Chain



The activities incorporated in the raw commodity supply operation can be broken down into cost pools in order to accommodate an activity based costing system (ABC). The cost pools could include start-up activities, training and land preparation, growing operations, harvesting and delivery and administration. Each cost pool should identify a cost driver and estimate the total number of transactions A map of the supply chain can then indicate the spatial distribution of the proposed small-scale farmer contracting model. The map should show the total acreage-potential supply volume incorporated in the project, as well as the availability of roads, access and the distance of farmers from the processor. The average distance from farmer to processor can be estimated for the small-farm project for logistical purposes An analysis of the activities can be performed to estimate the number of visits per farmer per activity per year and used as the basis to calculate logistics cost. The activities of the operation can be used, moreover, to ensure the spatial map includes the necessary information, as well as to create a checklist of factors that should be consulted in the design process. Factors that can be checked include the total area, the total number of farmers, the types of roads and communication systems that are available Finally, the use of queuing theory, in the form of convenient software packages, could be employed to optimise logistical cost.

7.4.5 The Contract Conditions

The design of the contract can be based on the characteristics of the conditions that apply to the proposed supply operation. The contract conditions, illustrated in Table 7.1, can then be analysed with respect to the presence of interlocking factors and or issues that could influence enforcement. On the basis of transaction cost theory, the contract conditions can be used by agribusiness as a basis to select the optimum type of contract structure on the vertical co-ordination continuum of Petersen and Wysocki (1997;1998) to control the project.

The contract conditions can be listed in tabular format and graded on a five point basis to conform with the vertical co-ordination continuum of Petersen & Wysocki (1997, 1998) The conditions could include the ability of the parties to walk away from the contract, the duration, the level of substitutes, the identity of the parties, the levels of ex ante and ex post control, the level of information shared and how contract enforcement is achieved.

Table 7.1 Classification of Contract Characteristics

Contract Characteristics	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Nature of contract	Classic		Neo-classical XX		Relational
Ability to walk away	High		Inter. XX		No
Duration	Short		Inter.		Long XX
Substitutes	Yes		Few		No XX
Own identity	Yes XX		Partial		No
Ex ante control	High		Inter.		Low XX
Ex post importance	Low		Inter.		High XX
Information shared	Low		Inter.		High XX
Enforcement	Legal		Complex XX		Hierarchy

CHECK LIST

1 Farmer participation ?
2 Level of trust ?
3 Farmers association ?
4 Contracts for females ?
5 land degradation factors ?
6 Autonomy tribal structures ?
7 Food crops ?
8 Mutual Asset specificity
9 Interlinkin factors
10 Expectation
11 Provision of output
12 Education ?
13 Land tenure

The actual contract conditions can be projected in the planning process and then plotted in the table. The suitability of the contract conditions, in turn, can be subjected to a checklist that includes whether or not there has been farmer participation in developing the contract conditions, the estimated level of trust and, whether or not the

possibility of a farmers association has been considered Other checks include whether the contracts include female farmers, the issue of land degradation, the accommodation of tribal structures and commodity characteristics and the possibility of developing mutual asset specificity. For illustrative purposes, assume that the highlighted quadrants (**XX**) in the table represent the projected contract characteristics of a proposed project. On the basis of the projected conditions (**XX**), the firm will require a relational or neo-classical type contract structure to accommodate the smallholder arrangement.

7.4.6 The Transaction Characteristics

The estimated or actual transaction characteristics of frequency, asset specificity and uncertainty in the proposed smallholder supply operation can be determined and graded (1-5) on the basis of the conceptual framework developed in Chapter Four A set of transaction characteristics and their respective grade have been matched in Table 7.2. The projected transaction characteristics can be based on an analysis of the projected and actual activities and assets employed in the grower-processor supply chain and the actual contract characteristics of the supply operation Transaction frequency can be determined by the number of raw commodity deliveries, the number of agribusiness visits or the number of accounting transactions generated by smallholder supply activities.

Table 7.2 Classification of Transaction Characteristics

Transaction Characteristic	Cost Drivers	Calculation	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Frequency	Total deliveries Total visits Total accounting Transactions	Supply records See Section 9.4.3 Accounting records					XX
Asset Specificity	Value of plant Co-ordination level Commodity perishability	Financial records Volume-continuity See physical properties					XX
Uncertainty	Unique supply conditions	Analysis of contract conditions. See 9.4.4 + checklist			XX		

The actual value-specifications of the processor plant and equipment can be used as a basis to estimate the level of asset specificity in conjunction with an analys f c -

ordination requirements, the disposability of assets and the transferability of assets Finally, an analysis of the actual contract characteristics, in conjunction with a checklist of factors, can provide a subjective estimate of the level of uncertainty The level of each of the transaction characteristics can be graded (1-5) on the same basis as the contract conditions to provide a basis for selecting the optimum governance form to co-ordinate the grower-processor activities. For illustrative purposes assume the highlighted characteristic (XX) in the table represents the actual projected transaction characteristic of the smallholder supply operation The highlighted transaction characteristics indicate high levels of frequency and asset specificity and an intermediate level of uncertainty.

7.4.7 The Optimum Structure

The selection of the optimum co-ordination structure, illustrated in Table 7 3, is based on transaction cost theory developed in Chapter Three, that is further operationalised in the conceptual framework of Chapter Four. The actual transaction characteristics of the smallholder supply operation, graded from low to high (1-5), are matched with the most suitable governance structure along a vertical co-ordination continuum of structures. For illustrative purposes, assume the firm currently employs a combination of specification contracting (**) and the company estates (**) to supply the raw commodity as indicated in Table 7 3 The hypothetical projected contract and transaction characteristics of Sections 7 4 4 and 7 4 5 of the proposed small-holder project (XX) can be matched with the most suitable structure on the vertical co-ordination continuum and then compared to an existing structure The projected hypothetical transaction characteristics (b) indicate that a governance structure ranging between a strategic alliance and full vertical integration is required to co-ordinate high levels of frequency and asset specificity (5) and an intermediate level of uncertainty (3). The projected contracted conditions (c) also appear to support the need for a more relational type of contract that is best accommodated in a governance form that ranges between a strategic alliance and full vertical integration

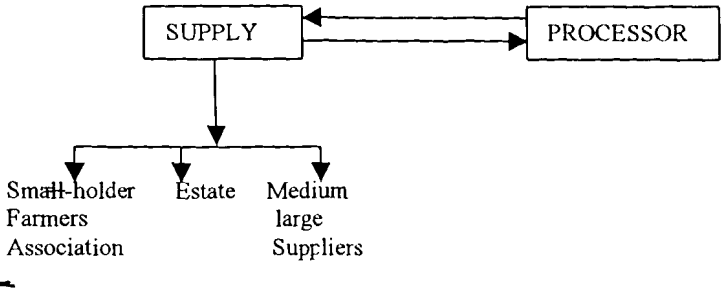
Table 7.3: Matching Structure and Transaction Characteristics

Grade	1.Low	2.Low-Int.	3 Intermedia te	4 Int high	5 H gh
Vertical Co-ordination Continuum	Spot Market	Specification Contracting	Strategic Alliance	Formal Co operation	Full Vertical Integration
a) Actual Structure		**			**
b) Actual Transaction Characteristics					
Frequency					\ \
Asset Specificity					\ \
Uncertainty			XX		
c) Contract Characteristics	1.Classical	2.Classical- neo classical	3 Neo classical	4 Neo- class Relational	5 Relational
Level of Control			XX		\ \
Ability to walk away			XX		\ \
Substitutes					\ \
Parties have own identity	XX				
Duration					\ \
Ex ante control					\ \
Ex Post Importance					\ \
Information Shared					\ \
Enforcement			XX		\ \

Based on: Williamson (1975; 1981; 1986); Petersen & Wysocki (1997, 1998) and Sartorius and K r ten 2 2

The actual governance form (**) appears to employ slightly lower levels of managed control than the optimum structure suggested by transaction cost theory indicating perhaps, that the present-future structure should be moved towards a higher level f managed control. A possible reason for this could be that the contract-transacti n characteristics require a more relational type of contract structure than specification contracting which is used in the actual governance form. The optimum governance form can be complimented with a suitable management structure to ensure that the smallholder activities are configured with the company The case studies suggest that supply should be jointly co-ordinated by the agricultural and processing divisions of the company, when agribusiness is also a grower. In the case where no agricultural division exists, raw commodity supply would report directly to the company A suggested option is represented in Figure 7.4.

Figure 7.4 Management Structure of Supply



The suggested structure can include a company officer on the management structure of the farmers' association and a member of the farmers' association on the raw commodity supply committee of the processor.

7.4.8 The Logistics

The logistics cost, developed on the basis of Section 7 4 4 and illustrated in Table 7 4 includes a range of agribusiness expenditure that relates to the number and spatial dispersion of the growers. These costs will include travel, human resources and facilities expenses incurred as a result of co-ordinating this supply source Agribusiness visits include advice-technical inputs with respect to the land-preparation, growing, harvesting and delivery activities of the small-scale growers The distance and travel cost can be subjected to sensitivity analysis to evaluate the impact of different scenarios. Activity based costing can be used to identify the relevant cost pools, cost drivers and transaction rates in order to charge out logistics costs.

Table 7.4 Distance and Travel Cost

Farmer Activities	1.Number of Visits (see 9.4.3)	2. Average Distance (see 9.4.3)	3. Distance	4 Fuel Cost	5 Resources Facilities Cost	6 Total Cost	7 Cost per ha
	No.	Km	Km	R	R	R	R
Start-up	XX	XX	1 x 2	XX	XX	XX	RXX
Land Preparation	XX	XX	1 x 2	XX	XX	XX	RXX/a
Growing	XX	XX	1 x 2	XX	XX	XX	RXX/a
Harvesting	XX	XX	1 x 2	XX	XX	XX	RXX/a
Delivery	XX	XX	1 x 2	XX	XX	XX	RXX/ha
Total	XXX	XXX	1 x 2	R XX	R XX	R XX	RXX/ha

7.4.9 Transaction Cost

The calculation of the agribusiness transaction cost of the smallholder project illustrated in Table 7.5, can be determined on the basis of the previous calculations in Section 7.4.4, 7.4.5 and 7.4.7. Estimates of staff and facilities costs can be performed on the basis of the analysis of the activities translated into manpower requirements The analysis of the activities can be used to determine the total time-staff cost expended on the smallholder project, whilst the facilities costs can be based on the level of staff cost.

The calculation of transaction cost, developed on an activity based c stin methodology, can be subjected to sensitivity analysis in order to reflect the differential cost of the project. The incremental cost of smallholders per hectare can be determined by comparing the transaction cost of agribusiness both with and without a farmers' association or, alternatively, by comparing the transaction cost per hectare with larger suppliers.

Table 7.5 Estimated Transaction Cost.

Cost Element	1. Travel Cost (Table 7.4) R	2. Staff Cost (Estimate* R	3. Facilities Cost (Estimate*) R	4. Total Cost (1 + 2 + 3) R
Start Up Cost*	XX	XX	XX	XX
Land Preparation	XX	XX	XX	XX
Growing	XX	XX	XX	XX
Harvesting	XX	XX	XX	XX
Administration	XX	XX	XX	XX
Total	R XX	R XX	R XX	R XX
Cost per hectare	R X	R X	R X	R X

CHECK LIST
1 Sensit v t
analysi
2 Farmer
ass ciat n
3 mpact n w t
lar er u ers
4 First ta e
Ec n m

Agribusiness can use this approach as the basis for encouraging the formation of a farmers association, to lobby for state-donor aid or to charge the incremental cost back to the respective farmers. Furthermore, the usefulness of separately identifying transaction cost, in conjunction with the respective activities, lies in the increased ability of the firm to investigate how the prevailing institutional cost can be influenced to further reduce its transaction cost, for instance, influencing le i lation that could affect property rights economics.

7.4.10 The Capital Investment Decision

The final investment decision, illustrated in Table 7.6, can be based on the net present value of the project. The results of the case studies suggest a suitable time horizon for agribusiness projects would normally extend to at least twenty years (Gittinger, 1982) In view of the many factors influencing small-holder supply uncertainty in developin countries, it is suggested that the normal discount rate of the firm is increased by tw percent (2%).

The cash flows of the smallholder project can be determined using financial techniques like the discounted cash flow method (Drury, 1996; Horngren et al, 1999) If the project includes equity or political economy objectives that could translate into tangible monetary assistance, this could be estimated. Agribusiness, on the basis of discounted cash flow techniques, can ascertain the net present value of the project to determine the ultimate impact on shareholder wealth.

Table 7.6 Project Cash Flows

Cash Flows	Year 0	Year 1	Year 2	Year 3	Year 4 20
Working Capital	(XXX)				XXX
Fixed assets	(XXX)				
Start-up cost	(XX)	(XX)	(XX)		
Transaction cost				(XX)	(XX0
Logistics cost				(XX)	(XX)
Purchase of crop				(XX)	(XX)
Factory variable cost				(X)	(X)
Variable cost of sales				(X)	(X)
Revenue				XXX	XXX
State Support-tax relief	XX	XX	XX	X	X
Net Cash Flow	(RXXX)	(RXXX)	(RXXX)	RXX	RXX
NPV	RXXXX				
IRR	X %				
Cash Break Even, AAR	Year X				

CHECK LIST
1 Sens tivity a al
2 Farmer
assoc ati n
3 mpari n w t
lar er u
4 F rst ta e
Ec n mi
5 P llut n
6 C m any im e
7 Trad t na
structures ?

This technique can be complimented with sensitivity analysis that can be perf rmed by way of electronic spread sheets. Sensitivity analysis can evaluate the impact of a farmers association, using alternate sources of supply or charging back incremental smallholder cost. The difference in shareholder wealth can be cited as the basis for soliciting government support, the formation of a farmers association or to char e back the incremental loss to smallholders Qualitative issues can be included in a checklist of factors. Qualitative factors could include concern for the environment, loss of traditional structures and the company image. Finally, the integrator is in a position to make a decision with respect to accepting-rejecting the proposed project Should the project be accepted, the company can initiate the necessary steps to be in the implementation procedure.

7.4.11 Implementation

The implementation of the proposed small-holder contracting project will be in with the development of the annual integrator budgets The budgetary control system will embrace the detailed cost and responsibility centres that will be empl ved to mana e the supply operations. The budgetary control system, in turn, will be used as a basis t

develop the performance reporting system of the integrator that will determine the type and frequency of supply reports.

7.4.12 Monitoring

The monitoring of agricultural projects has been cited as a crucial success factor to configure the expected economic value with the actual results The case studies suggest that the cost systems of the company either included the costs of managing the smallholder project as general overheads or, alternatively, the cost systems were unable to trace certain integrator costs to the smallholder project The use of a monthly reporting system, incorporating activity based costing, could be used t demonstrate the actual versus budgeted performance of the smallholder project This study proposes that the balanced scorecard approach to monitoring performance, developed in the 1980s (Kaplan and Atkinson, 1998), can be expanded to measure performance on a more comprehensive basis. This proposal contributes a unique perspective to the balanced scorecard approach which currently measures business performance from four different perspectives. These perspectives include the financial results, the level of customer satisfaction, the internal efficiencies of the firm and the learning and innovation performance of the firm (Kaplan and Atkinson, 1998) This approach also demonstrate that causality exists between the outcome variable of performance and the driver variables that include customer satisfaction, internal efficiencies and learning and innovation. Table 7.7 reflects how the balanced scorecard approach can be expanded to include an additional two levels, namely, the transaction characteristics and key environmental-social-physical variables

Table 7.7: Expanded Balanced Scorecard

Sector of Performance	Performance Indicators
1. Financial	Net profit, ROI,
2. Customer	Market share, regional versus international
3. Internal Efficiencies	Yield, Cost per ton, capacity utilisation, benchmarked costs of production,
4. Learning and Innovation	Growing technologies, development of value added products, development of new technologies, design of logistics, choice of contracts
5. Transaction-Growers	High Frequency, High asset specificity, High levels of uncertainty
6. Environmental-societal	Social costs, Water, Power, Lab ur Revenue Received. Y el l Taxes Government-CDC partner

The usefulness of this finding is that management attention is specifically directed t an alternative perspective to reducing cost. The results of the case studies suggest that the design of management control systems could reflect key external and transaction cost variables which influence performance This approach to expand n the balanced scorecard of Kaplan and Atkinson (1998) suggests that two additional levels to the balanced scorecard, namely, levels five and six, can be added and a cause and effect relationship can be traced from level six through to level one

7.5 Summary and Conclusion

This chapter briefly discussed the problems of design before developing a series of proposals for small-holder contracting arrangements. The proposals were based on the lessons learned in Chapters Two, the conceptual developments of Chapter Three and Four and the results of the case studies in Chapters Five and Six A proposed model was then developed. The proposed model suggests that small-holder contracting projects can be treated as strategic investment decisions by the agribusiness partner The proposed model can, therefore, be evaluated with respect to its objectives, the firm strategy, the detailed plans, the implementation of these plans and the monitoring of project results. The development of the detailed plans incorporated the use of transaction cost theory and activity based costing systems to calculate the total and differential transaction cost of small-holder projects The detailed plans, moreover, demonstrated that they are capable of being subjected to sensitivity analysis which could incorporate a multiple scenario outlook. The scenarios investigated could examine the impact of using a farmers' association, the opportunity cost of not engaging larger suppliers or the effect of price changes The importance of understanding the cost structure of contracting projects is illustrated by the case studies, which demonstrate that considerable resources have been dedicated to the development and management of small-holder contracts over many years