

## **Chapter Six: Sappi Case Study: Timber**

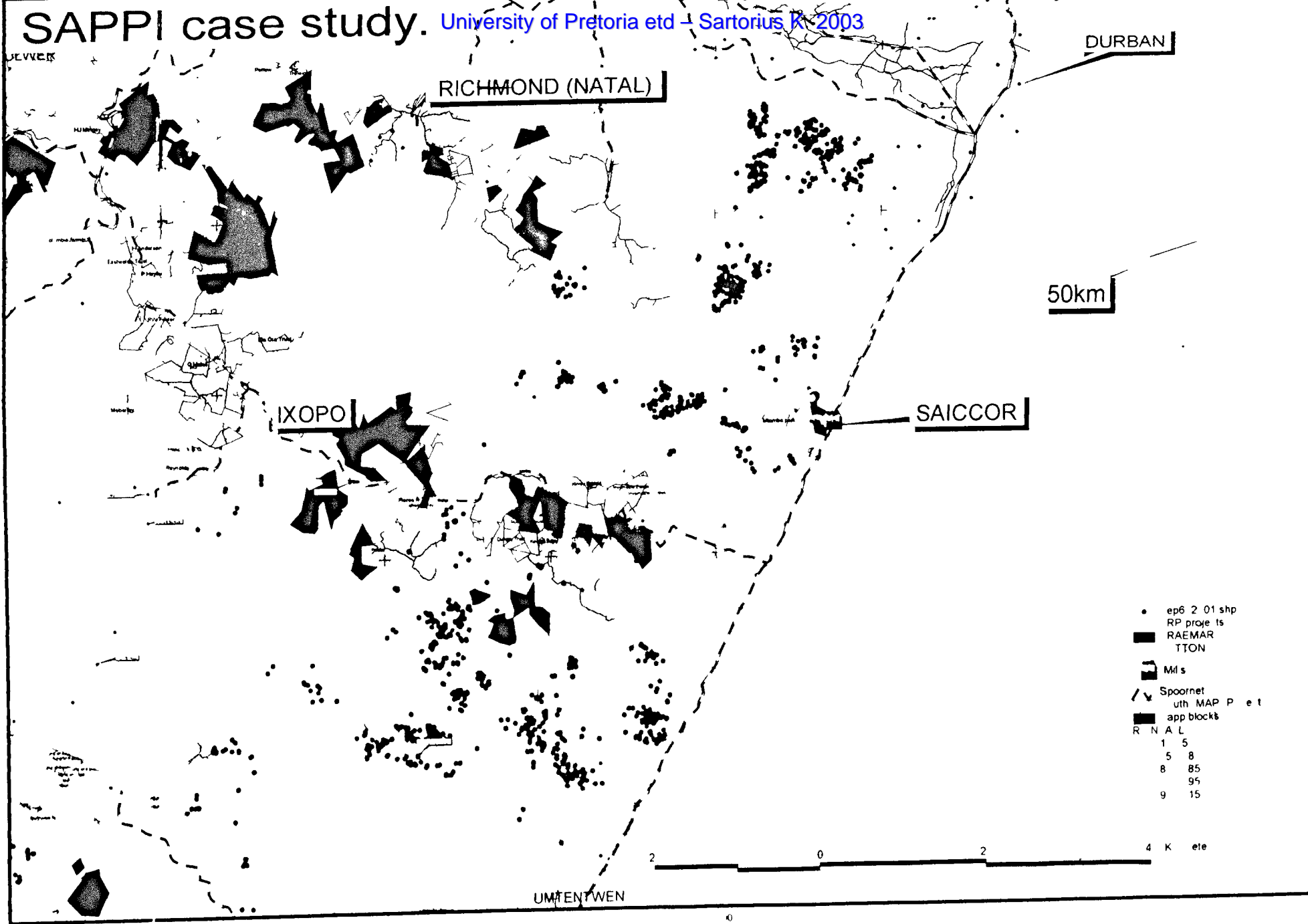
### **6.1 Introduction**

The objective of this chapter is to further test the research questions using a case study in the South African timber industry. The case study describes the Sappi-Saiccor Company on the Kwazulu-Natal South Coast. Figure 6.1 illustrates the location and layout of the timber supply chain. In particular the case study describes the Sappi Company's Project Grow contract farming experience involving a micro-grower program.

The chapter commences with a discussion of the background of the forestry industry in South Africa before introducing the Sappi-Saiccor operation. The chapter then describes the company operation and logistics before examining the data and the economics of the timber supply chain. Each of the research questions are separately tested with a view to emphasising and comparing the results with the previous case study in the sugar industry. Finally, a summary and conclusion is developed.

### **6.2 The Forestry Industry in South Africa (Courtesy of Sappi Limited and the South African Forestry Association)**

The forestry industry consists of two primary segments, the growing of timber which falls into the forestry sector and the processing of timber which falls into the manufacturing sector. The growing of timber, currently, contributes 8% of the national agricultural gross domestic product and the manufacture of pulp and paper products accounts for 9% percent of the national manufacturing gross national product. The industry makes a significant contribution to foreign trade and forestry products generated an annual net trade surplus of R 3.3 billion, or 8% of South African exports, in 2000/1. The industry has demonstrated a consistent annual growth of 8% over the last ten years and is one of the most global industry sectors in the South African economy (Forest Owners Association, 2001)



The timber industry is a major employer of labour in South Africa. In 2001 the industry employed 135 000 people who were either engaged in the primary production of timber or the processing of wood. This sector also includes the support of over two million dependants, many of whom live in rural areas. The estimated linkages effect generated by the industry would suggest an average multiplier of four resulting in a total employment potential of 500 000 people. The industry is a major contributor towards the development of rural infrastructure and contributes R15 million per annum to the provision of housing and R40 million per annum to the provision of health care. Other contributions to rural infrastructure include R15 million per annum towards the provision of schooling and bursaries and R10 million per annum towards the maintenance of provincial rural roads.

A high level of regulation has influenced the performance of the timber growing industry. The National Water Act of 1998, in particular, has increased the difficulty in obtaining water use licenses for afforestation purposes. The timber industry, although an active partner in the national water program, has been declared an industry that contributes towards a reduction in stream flow. The increased difficulty in obtaining water licenses has been most acute in the case of the emerging small-scale grower sector in KwaZulu-Natal and the Eastern Cape. A further threat confronting the timber industry involves the impending property rates bill that would be levied against the value of the land, and possibly, include improvements. Other issues restricting the expansion of the industry include environmental standards, fire losses, labour market legislation and a deterioration of infrastructure, security and local government services. Additional constraints include a reduction in government funding for research and development, increased taxation, the impact of AIDS and the high cost of transport and capital equipment.

The timber industry has promoted the development of 15 000 emerging timber growers, in addition to the promotion and support of forestry contractors and entrepreneur development programs. The expansion of small-scale farmer operations, illustrated in Table 6.1, has largely occurred by way of programs co-ordinated and sponsored by agribusiness or as a result of the informal-illegal expansion of timber growing in rural areas. The potential to expand small-scale growers has been

estimated at an annual growth rate of 17 630 hectares between 2001-2005 that would result in a total increase of 93 100 hectares involving approximately 10 197 new applicants.

**Table 6.1: Small-scale Timber Production**

Location	Area Planted in hectares		No. of Growers		Average Size
	Managed	Total	Managed	Total	
Zululand	16 125	32 250	6 155	12 310	2.6 hectares
Natal Midlands	5 258	7 361	3 580	2 944	2.5
Southern Natal	2 555	3 577	2 504	3 577	1.0
Eastern Cape	267	267	45	45	5.9
<b>Total</b>	<b>24 205</b>	<b>43 455</b>	<b>12 284</b>	<b>18 876</b>	<b>2.3 hectares</b>

Source: South African Firestry Association

### 6.3 The Timber Supply and Processing Operation

Sappi Forest Division controls the timber growing operation and all growers are either owned or contracted to this division. The supply chain consists of a range of growers that deliver timber on a continuous basis to the timber milling operation. Company plantations are located at Umkomaas and Richmond, while both company and contract growers operate in the Kwazulu-Natal and Mpumalanga provinces. Contracted growers are mostly located within a one hundred kilometre radius of the company mill and include a range of medium to large growers and a managed small-scale project, Project Grow. The volume of supply is illustrated in Table 6.2

**Table 6.2 Timber Supply**

Species	Road	Rail	Total	Tons
Gum	28545	12239	40784	1489203
Wattle	4631	1254	5885	174317
<b>Total</b>	<b>33176</b>	<b>13493</b>	<b>46669</b>	<b>1663520</b>

Source: Sappi-Saiccor

### 6.3.1 The Data

The data consist of the historical records of Sappi-Saicor, Sappi Forest Division, Project Grow and Forestry Economic Services (Pty) Ltd. Financial data were obtained from the Sappi head office in Johannesburg. The data for Sappi Forest Division were acquired from Forestry Economic Services, in Pietermaritzburg, Kwazulu-Natal and Johannesburg, as well as the head office of Sappi Forest division in Pietermaritzburg, Kwazulu-Natal. The cost data includes the results of a benchmarking exercise that was conducted between 1997 and 2000. The cost data for Sappi Forest are, largely, made up by two plantation areas, namely, the Richmond and Umkomaas areas. Further comparative data, including the weighted average regional and national figures were provided by Forestry Economic Services and the Forest Owners Association located in Johannesburg. The medium to large scale grower data, based on a sample area of 61 000 hectares, were also obtained from Forestry Economic in Pietermaritzburg as a result of instituting costing workshops that were used to assess the cost structure of this category of farmer. Finally, the data for Project Grow farmers have been developed by the Sappi Forest division in Pietermaritzburg, in conjunction with the Lima Rural Development Foundation, also located in Pietermaritzburg. The cost data for this category of grower, included a sample size of 64 hectares of growers within a fifty kilometre radius of the Sappi-Saicor mill. This category of data may have certain limitations as a result of not recording every Sappi Forest cost in relation to the project. In many instances, additional Sappi Forest overhead costs could possibly be traced to the project.

Further qualitative data were collected on a number of field trips that were conducted between June and December 2001. The data were either located in the written records of the companies or by way of interviewing the respective company officials. The researcher was required to enter into a secrecy agreement with Sappi Limited due to the highly competitive nature of the Timber industry. Finally, the researcher was authorised to obtain and use this data and the completed case study has been reviewed by the management of the Sappi Limited Company.

### 6.3.2 The Company

Sappi-Saicor, situated at Umkomaas on the south coast of Kwazulu-Natal, is a Sappi Limited company in the Sappi Forests Products division. Saiccor, acquired by Sappi Limited in 1988, provides the group with a pulp revenue stream which hedges the pulp purchases of the global fine paper business. Sappi-Saiccor is one of the world's leading producers of rayon grade dissolving wood pulp. The company was founded as a joint venture in 1953 and commenced production in 1955. The founding partners were Coutaulds, SNIA of Italy and the Industrial Development Corporation of South Africa. The production of dissolving pulp has increased from 40 000 tons in 1956 to the current level of 560 000 tons in 2001. The capacity of the mill is 1600 tons of pulp per day and the related timber volume processing capacity is 6000 tons per day. A portion of the production process has been subcontracted in order to reduce the level of fixed cost and induce capacity flexibility. The mill dispatches pulp on a continuous basis to Durban where on average three vessels a week leave for different continents.

Sappi-Saiccor exports over 99% of its products to customers in Western Europe, the Americas and the Far East. The company currently employs a 1000 people and operates on a continuous three shift system for 365 days per annum. Plant and equipment is valued in excess of R5 billion at current cost. Sappi-Saiccor has, recently, made sizeable investments in research and development facilities and staff. The company has maintained good margins despite recent decreases in both the volume and price of cellulose markets that have reduced production by 100 000 tons during 2000/1. Demand for Saiccor's products is expected to remain under pressure, however, the mill's low cost structure is expected to keep the company competitive. In 2000/1 Sappi-Saiccor generated sales of R2.85 billion and contributed R1.16 billion to operating profits out of net operating assets of R1.32 billion. This performance resulted in a return on operating assets of 88%, a net profit margin of 40.7% and an asset turnover of 2.16. An important company strength lies in the company's control over its own raw material supply with over 75% of hardwoods processed being grown by the Sappi Forest Division and the balance obtained by specification contracting.

### 6.3.3 The Growers

Three principal categories of grower supply timber to the Sappi-Saiccor mill. These growers include the plantations of the Sappi Forest division, medium to large contract growers and a managed smallholder scheme. Sappi Forest Division oversees the production and delivery of all timber to the Sappi-Saiccor mill. Sappi Forest, as a grower, owns and manages 500 000 hectares of plantations in Southern Africa that primarily grow eucalyptus and softwoods. The forestry division consists of the regional growing operations in South Africa that include Natal, Zululand, the Highveld and the Lowveld. The second category of grower consists of medium to large scale contracted farmers. This category of farmer can generally be classified in terms of a medium to large size family farm with an area under timber in excess of fifty hectares. These farmers are generally involved in a number of agricultural sectors including timber, sugarcane, tea and fruit. These growers are largely autonomous with respect to the growing of timber but the felling and delivery operations are controlled and coordinated by Sappi Forest Division. The third category of grower includes managed small-scale farmers incorporated in Sappi's Project Grow program. This category of grower, occupying an average of 0.6 hectares, is, mostly located within a one hundred kilometre radius of the company mill. Project Grow is a tree farming scheme that has the objective of converting subsistence farmers into emerging commercial operations. This project was launched in 1983 by Sappi Forests, the Gencor Development Fund and the Kwazulu Department of Agriculture and Forestry with a view to developing viable small scale timber operations in rural Kwazulu-Natal. Since 1989, Sappi Forest division has contracted out the management of this project to a rural development organisation called Lima which is an NGO registered under Section 21. Project Grow now involves over 7000 growers occupying 4223.8 hectares and Sappi Forest Division has invested in excess of R10 million in Project Grow in terms of loans and an additional R5.2 million for seedlings.

The Sappi Project Grow arrangement provides small farmers with financial assistance, seedlings, technical advice and a guaranteed market. Sappi Forest provides an interest free loan of up to a maximum of R2700, calculated on a per hectare basis, for farmers to establish trees where all contracts have the approval of the local tribal authority.

Thereafter, advances are paid out to the farmer for completed certified work over the growing period of the trees to ensure that operations are funded over the growing cycle. The extension officers visit the growers frequently after the trees have been established to provide further assistance with weed control and the preparation of fire breaks. Sappi Forest, if requested by the growers, may also assist during negotiations with harvesting and transport contractors. A majority of the small-scale farm workforce is made up by female household members where many of the men are migrant workers. At the time of harvesting Sappi Forest buys the timber from the farmers at a market related price less the advances paid out during the growing period.

### 6.3.4 Organisation Structure of Timber Supply

The continuous production of dissolving pulp requires a detailed level of co-ordination to synchronise geographically dispersed grower supplies with the high cost processing facilities. The co-ordination, illustrated in Table 6.3, indicates the integrator's choice of governance form on a continuum of structures suggested by Petersen and Wysocki (1997; 1998). In this case, the integrator co-ordinates 50% of timber supply by way of the fully integrated company plantations and 50% by way of a detailed specification contracting arrangement that allows the integrator to control the growing-felling of contracted timber operations. The organisational structure thus incorporates a combination of full integration and specification contracting.

**Table 6.3: Organisation structure: Timber Supply**

	Spot Market	Specification Contracting	Strategic Alliance	Formal operation	Full Vertical Integration
Level of managed co-ordination	0%	Low	Intermediate	Int. high	High
Actual Governance Form		1. Contract Growers 50%			2. Company Estates 50%

Based on Chapter Three: Petersen and Wysocki (1997, 1998)

The growers in the Sappi-Saiccor timber supply operations have various categories of land tenure arrangements. The company holds freehold title to its timber plantations as do the medium-large growers in the supply chain. The land tenure



governing small-scale farm production is largely regulated by communal tenure arrangements implemented and controlled by tribal authorities. The Tribal authorities have access to the land as defined by the Proclamation R 188 of 1969 where land access is usually by virtue of membership to a community and not through sale, lease or rent (Klug, 1996).

### **6.3.5 Supplier Contract**

All suppliers must enter into a timber purchasing agreement with Sappi Forests (Pty) Limited. The purchasing agreement specifies the exact location of the grower as well as the commencement and duration of the relationship. The agreement indicates the total tonnage to be delivered to the mill during the period of the contract and also stipulates the annual tonnage. The contract specifies the price that the company will pay for the tree species to be delivered or alternatively that the parties shall agree to an annual price. The supplier must adhere to quality specifications as determined by the company mill. The supplier is required to obtain the necessary permits, license or statutory authority from the Department of Water Affairs and Forestry, the National or Provincial Environmental Authority and the Department of Agriculture. The conditions of delivery, risk, ownership and payment are outlined in the contract with the risk only passing to the mill once the specified timber has passed over the company weigh-bridge. The date and mode of payment for timber delivery is also specified. The company undertakes to supply seedlings, free of charge, on condition that proper notification is given by the supplier and that transport costs are to be borne by the supplier. The company also undertakes to provide free technical advice during the growing cycle of the timber, however, the supplier must provide reasonable notification to the company and access to the growing site. A clause is inserted to cover both parties from a "force majeure" and outlines the terms and conditions of the suspension or waiving of contractual liabilities. The enforcement of the contract is stipulated by way of written notice to the defaulting party and the supplier may not sub-contract or cede any of the terms and conditions of the agreement to a third party. Finally, the contract specifies the domicilia of the parties and outlines further miscellaneous legal clauses to the purchase agreement.

In certain cases, suppliers enter into a financial assistance agreement with Sappi Forests. This agreement, called a MAP Agreement 1, stipulates the background of the applicant, the duration of the arrangement and an exact schedule of the growing and harvesting of specific species of trees. This agreement, moreover, stipulates the rate of interest to be paid to the company together with notification of a liability for finance charges. The terms of repayment are specified by way of a deduction of the financial assistance received from payments made with respect to the supply of timber under the timber supply agreement. Furthermore, the conditions that apply in the event of the non supply of timber to the company, for whatever reason, are outlined in this agreement. The supplier, applying for financial assistance, should be the registered owner of the stated property, and, if a loan in excess of R 50 000 is made, then the supplier is obligated to register a covering mortgage bond in favour of Sappi Forests. In certain cases where the supplier plants in excess of 500 hectares the company may enforce a timber servitude on the supplier as an additional measure to enforce the contract. The contract, moreover, stipulates the general obligations of the supplier and includes conditions that enforce the supplier to comply with all environmental and silvicultural requirements. The contracted supplier, moreover, must sell the specified timber to Sappi Forests when the trees are at a specific age at a market related price relative to the area in which the mill is established. The MAP Agreement 1 includes the provision of free technical advice to the supplier up to a stated number of visits per year and outlines the risk-insurance requirements to be met by the grower who shall forward a copy of the insurance agreement to the company. The agreement, furthermore, outlines the conditions relating to the breaching of the contract, death or insolvency as well as stipulating that the supplier shall not be able to transfer any rights to third parties. Finally, the agreement stipulates the domicilia of the parties and outlines further miscellaneous legal clauses.

A different supply arrangement is used to contract small-scale farmers under the Project Grow arrangement. The Grow Agreement requires the contracted grower to have permission to occupy the land from the tribal authority that controls the said property and involves an arrangement whereby the supplier is supported both financially and technically by the Sappi Forest division. The duration of the arrangement is specified and the terms of assistance outlined. Assistance is received in the form of an

initial interest free loan for planting, maintaining and weeding the timber. Sappi Forests also undertakes to provide seedlings free of charge. The grower must demonstrate they have all the necessary permits, licences and authority to grow timber on the said property including the compliance of the Department of Water Affairs, the National Provincial Environmental Authority and the Department of Agriculture. The grower undertakes to meet a range of obligations that include compliance with Sappi Forest's environmental and silvicultural practices and access to inspection by all stipulated parties. The grower is obligated to sell the timber to Sappi Forest and this timber must comply with the stated mill specifications. The supplier must also comply with Sappi Forest's instructions to harvest the timber at a specific age which in the case of eucalyptus ranges between eight and twelve years. The price paid for timber is negotiated between the parties and will generally be the prevailing price. All risk of damage remains with the grower until it has crossed the weigh-bridge although the timber that does not meet mill specifications may be rejected. The agreement, furthermore, cedes the grower's rights to the purchase price as a measure to provide additional security to the company. Finally, the contract outlines the conditions relating to the breach of the contract by the grower and the manner in which the contract will be enforced. The grower is not allowed to cede any rights or obligations to third parties and all notices to the grower are to be delivered personally by the company or at monthly Project Grow meetings.

### **6.3.6 The Transaction Characteristics of the Supply Chain**

The interface between growers and the company mill, with respect to the continuous supply of large volumes of timber, generates a unique set of transaction characteristics. The number of deliveries of timber to the mill has been used to demonstrate the transaction characteristic of frequency whilst the replacement value of the Saiccor processing plant has been used as a measure for the level of asset specificity. Finally, a qualitative analysis of the conditions of supply has been used as a basis to estimate the level of supply uncertainty. The actual Sappi-Saiccor timber supply transaction characteristics, illustrated in Table 6.4, were developed for the period 2000/1 and are based on the delivery of over 1.6 million tons of timber to the Sappi-Saiccor timber yard.

### 6.3.6.1 Transaction Frequency

The Saiccor plant processes approximately 6 000 tons of timber per day that are delivered by a continuous stream of 125 road-rail trucks. Because of the perishable nature of wood chips the timber supply yard needs to be replenished on a daily basis. In 2001, some 46 669 truckloads of timber resulted in the delivery of 1 663 520 tons of timber involving 1 489 203 tons of gum and 174 317 tons of wattle. The transaction characteristic of frequency, on the basis of this large number of deliveries, has, therefore been graded as high.

**Table 6.4 : Timber Supply Transaction Characteristics**

Transaction Characteristic	Sappi-Saiccor
<b>1. General</b>	
Types of Growers	Estate, Large, Medium, Small, Micro
Hectares	500 000 hectares
<b>2. Frequency</b>	
Tonnage Crushed	1.64 million tons
Number of Deliveries	46669
Administration	5.3 tons transaction
<b>3. Asset Specificity</b>	
Co-ordination Level	12 months year/24 hrs day 7 days week road-rail, wood chips perishable, mill requirement 6000 tons day
Value of Estates	> R 3.8 billion (net operating assets)
Value of Plant	> R 5 billion (replacement cost)
<b>4. Uncertainty</b>	
Company Estates	Legislation, environmental issues, cost of inputs, physical variables, land constraints
Medium-large Growers	Timber Prices, physical variables, limited additional land, water cost, environmental
Small-scale Growers	Different time horizons, land tenure, cost of inputs, legislation, lack of access, moral hazard, theft
Processing	High Degree of leverage

### 6.3.6.2 Asset Specificity

The net operating assets employed are currently valued at R 1.3 billion, on a historical cost basis, that translates into a current replacement cost in excess of R5 billion for the year ending September, 2001. These assets are highly specific and have a low opportunity cost outside the timber industry. The assets, moreover, are relatively immovable and are also site specific as they have been located in close proximity to certain suppliers, harbour, rail and road facilities. The finished product is largely exported by ship and therefore the mill is site specific to the coast and harbour facilities. The high level of co-ordination required to synchronise the use of plant capacity and timber deliveries, combined with the perishable nature of wood chips, further elevates

the levels of asset specificity. Conversely, the asset specificity of the contracted growers is much lower. The medium-large growers are, mostly, also involved in the production of other commodities and their assets are of a general farming nature. The small-scale growers own few assets and contract out for activities that require the use of capital assets.

### 6.3.6.3 Uncertainty of Supply

The uncertainty of supply has, historically, been relatively low due to a number of factors. Firstly, the uncertainty of supply has been reduced by the monopsonistic nature of the timber industry where Sappi Limited is a major player. Secondly, the company estates have, historically, produced more than 50% of the timber processed by Sappi-Saiccor and uncertainty of supply is further reduced by the site specificity of many growers who are located within a fifty kilometre radius of the Saiccor Mill. Thirdly, uncertainty is reduced by the long term nature of timber production. Sappi Forest division is, in this regard, able to manipulate the supply of timber according to annual mill requirements and standing timber can, therefore, be felled if required or maintained until a future time when it is required. The economic viability of the standing timber is not affected due to the annual growth rate of this commodity.

A number of potential threats may contribute towards higher levels of timber supply uncertainty in the future. The problems of obtaining water licenses for small-scale growers, in particular, are compounded by the fact that this category of farmer is in the process of expanding the supply of timber to the Sappi-Saiccor mill. The uncertainty regarding the issue of water permits has been further compounded by the proposed price increase of water, in conjunction with, the payment of a levy. A further factor creating uncertainty is the increased regulation regarding environmental standards. Small-scale farmers, again, may be confronted with higher levels of constraints in this regard. Adding to this list of concerns, the proposed property rates bill is an additional source of uncertainty that could effectively reduce the profitability of timber growing. Other factors increasing uncertainty include labour market legislation, a deterioration in infrastructure and services, a reduction in government research, the impact of AIDS and the future cost of transport, capital equipment and insurance. In addition to these

constraints supply uncertainty is influenced by the different time horizons of the small-scale grower versus the mill, the problems surrounding the land tenure issue, the gender factor and the deteriorating security situation in many of the rural areas. Finally, factors that further contribute towards higher levels of uncertainty include high levels of theft, difficulties in accessing the property, impassable roads during the wet season, fire damage and a moral hazard factor that could result in the farmer selling his/her timber to the nearest available market. As a result of these factors the current level of Sappi-Saiccor supply uncertainty has been classified as low-intermediate.

#### **6.4 Do Transaction Characteristics Influence the Organisation Structure of Timber Supply ?**

The process of matching the transaction and contract characteristics of the Sappi-Saiccor operation with an optimal structure employs the same transaction cost theory approach that was used in the sugar case study. Transaction cost theory proposes that the governance structure of the timber supply operation will be a function of its transaction characteristics and that the firm will evolve over time to minimise transaction cost (Coase, 1937). The case study has, therefore, classified and graded the timber supply chain characteristics of frequency, asset specificity and uncertainty, as well as a list of contract conditions. The contract conditions that particularly influence the governance structure of the timber supply operation include the ability to walk away from the contract, the availability of substitutes, the degree of identification of the parties, the duration of the contract, the level of ex ante control and ex post importance, the level of shared information and the ability to enforce the contract.

In Table 6.5, a set of graded transaction and contract characteristics (1-5) are matched with suitable governance forms in accordance with the conceptual framework developed in Chapter Four. The details and grading of the actual transaction (b) and contract characteristics (c) of the Sappi-Saiccor timber supply operation have been developed in Section 6.3.6. The transaction characteristics (b) indicate a high level of frequency (5) asset specificity (5) and a low-intermediate level of uncertainty (2). Transaction cost theory would indicate that these transaction characteristics are best managed in a

governance structure that ranges between specification contracting (2) and full vertical integration (5).

**Table 6.5 : Matching Transaction Characteristics with the Level of Managed Control**

Vertical Co-ordination Continuum	1. Spot Market	2. Specification Contracting	3. Strategic Alliance	4 Formal Co-operation	5 Full Vertical Integration
<b>Variables</b>					
a) Sappi-Saiccor Structure		50% Contract Growers			50% Company Plantations
b) Transaction Characteristics	1. Low	2. Low-Int.	3. Intermediate	4. Int high	5 High
Frequency					Saiccor 4-9
Asset Specificity					Saiccor R 5 bill
Uncertainty		Saiccor			
c) Contract Characteristics	1. Classical	2. Classical-neo classical	3. Neo-classical	4. Neo-class Rel.	5 Relational
Level of Control	Low external	Higher external	Saiccor 50%	Hierarchy	Saiccor 5
Ability to walk away	High	Saiccor 50%	Less	Low	Saiccor 5
Substitutes	Yes	Lower level	Less	No	Saiccor 1
Parties have own identity	Yes	Saiccor 50%	Yes	No	Saiccor 5
Duration	Short	Longer	Saiccor 50%	Long	Saiccor 5
Ex ante control	High	Lower	No	No	N
Ex Post Importance	Low	High	Saiccor 100%	High	High
Information Shared	Low	Higher	Saiccor 100%	High	Extensive
Enforcement	Legal	Legal-complex	Saiccor 50%	Hierarchy	Saiccor 5

Based on : (Williamson, 1975; 1981; 1986; Mahoney, 1992, Petersen & Wysocki, 1997, 1998, Sartorius & Kirsten 2002)

Similarly, the actual contract characteristics (c) appear to suggest that Saiccor exercises a high level of managed control over the growers, the parties have a limited ability to walk away from the contract, there are no substitutes and the contract endures over a minimum of ten years. Additional conditions indicate a high level of shared information and a high level of ex post importance. Collectively, the actual contract conditions would be optimally co-ordinated in a relational contract structure that is best accommodated by a governance structure that ranges between specification contracting and full vertical integration. The actual governance form (a) of the timber supply operation indicates that 50% of supply is secured by way of specification contracting (contract growers) and 50% by full vertical integration (company estates) The choice of the actual governance structure, therefore, supports the conclusion that the actual transaction-contract characteristics match a governance form that ranges between specification contracting and full vertical integration. This conclusion supports the body of literature that concludes that the spot market is unlikely to be as synchronised as contracting with respect to ensuring the continuous supply of a uniform quality raw

commodity (Glover, 1984; Kilmer, 1986; Glover, 1994; Mahoney, 1992, Hennessy, 1996; Azzam, 1996). The annual purchase and delivery of 1 66 million tons of timber to the Sappi-Saiccor mill, if it were possible on an open market basis, would result in the need to significantly expand the procurement department of Sappi-Saiccor resulting in higher levels of classical contracting cost and an increase in purchasing overhead costs. The high cost asset specificity of the processing operations, moreover, could result in undue supplier opportunism that would place the processor in an untenable bargaining position. The presence of Mondi and other rival processors would further exacerbate supplier opportunism. Moreover, Sappi-Saiccor would be unlikely to co-ordinate, on a real time open market basis, the purchase and delivery of 6000 tons of timber per day on a twenty four hour basis. On the basis of the results, this study suggests that the transaction characteristics of the grower-processor supply chain have influenced the minimum, rather than maximum, level of managed co-ordination. Finally, the results confirm the overwhelming empirical evidence of the relationship between governance structure and transaction characteristics as demonstrated by the literature (Masten, 1996; Williamson, 2000).

## **6.5 Do Historical Legacies influence Transaction Cost in the Timber Industry ?**

The prevailing institutional framework within which the timber industry in South Africa operates is, in many instances, similar to that of the sugar industry. The question remains, however, the extent to which transaction cost in the industry is influenced, as well as the ability of this sector of the economy to economise some aspects of the institutional cost.

### **6.5.1 The Institutional Framework**

Similar aspects of the institutional framework that confront both the timber and sugar industries include human behaviour, the equity objectives of government-founders, regulation, land tenure issues and the bureaucracy cost of national local government. Other similar features include the impact of the macro-economic environment and the influence of natural resources. Certain features of the prevailing institutional framework confronting the timber industry, however, are unique. They are.



The location and concentration of the timber industry, in many instances, required the joint support of foreign investment and the South African government. The Saiccor operation, for instance, was initiated by the Industrial Development Corporation and the multinational Cotaldi of Italy in 1953. These investments have contributed to the present current value of plant and equipment (R5 billion), human capital and infrastructure that are all specific to the timber industry. Earlier regimes of the South African government simultaneously ensured the provision of infrastructure, harbour facilities, services and subsidies to assist the development of the industry. In a similar fashion, a few other players in the industry were selected, located in suitable natural conditions and nurtured in a similar fashion. In many instances, moreover, the founders of this industry had wide ranging equity and economic objectives that included high levels of investment in local communities. Currently, the monopolistic nature of the timber industry and the current structures constitute a major barrier of entry to new entrants.

The availability, location and efficiency of both local and central government structures has, particularly, influenced the economy of the timber industry. Recently, local government inefficiencies have particularly delayed the authorisation and expansion of small-scale farming projects in the timber industry. The timber industry is also confronted by a deterioration in rural infrastructures due to a lack of investment and is increasingly incurring incremental cost to maintain local roads and state owned facilities. These problems, combined with fiscal constraints and the problematic integration of the security force and police, are thought to have contributed to an increase in rural security problems including an upsurge in crime, arson and insecurity.

The long term macro-economic influence on the timber industry is a result of decades of local and international economic, fiscal and monetary policy. Currently, there is reduced demand in world markets for dissolving pulp, due to international supply configurations. This reduced level of demand has caused a 25 % (100 000 tons) contraction in the use of Sappi-Saiccor capacity and demand for this product is expected to remain under pressure in the immediate future.

### 6.5.2 The Influence of the Institutional Framework on Transaction Cost

The transaction cost for new entrants to the timber industry has been elevated as a result of the barriers of entry that have been created as a result of historic legacies promoting the original concentration of the industry. In many instances new entrants are forced into marginally productive areas that are further away from processing facilities. Government, moreover, has limited capacity to establish infrastructure and services in these areas adding to the transaction cost of entrants. The deterioration of roads, the limited availability of suitable land and locations, the deteriorating security in rural areas and the quasi monopoly position of the timber industry, have all contributed towards higher levels of transaction cost for both new and existing players in the timber sector. The equity objectives of the original founders of the timber industry have also contributed towards the current level of transaction cost. In many instances, the timber industry maintains local community infrastructure and services. An estimated R 80 million per annum is spent by the timber industry to maintain roads-infrastructure, provide housing and for the provision of healthcare.

The application for water use rights, based on the Water Act of 1998, requires repeated visits and multiple permission from a plethora of authorities. Start-up transaction costs for new entrants, especially small-scale growers, are further exacerbated by long delays and the inefficiency of local government structures. The application procedure, in this regard, is delayed by the need to satisfy traditional authorities, the Department of Water Affairs, The Department of Environmental Affairs, the Department of Agriculture and certain wildlife and cultural heritage bodies. Other institutional framework variables influencing transaction cost include the problem of AIDS, the withdrawal of government from research, depressed international demand for dissolving pulp and natural resource constraints in Southern Africa. It is expected that the timber industry will incur higher levels of labour cost, including medical expenditure as a result of AIDS for an estimated 135 000 direct workers and their two million dependants.

The influence of the prevailing institutional structure and existing property rights economics on the transaction cost of the timber industry complements the experience of the Southern African sugar industry as discussed in the previous chapter. On the basis of

the results of the results of the case study there is strong evidence to suggest that specific institutional variables, that are the result of historical legacies, have influenced the transaction cost of the timber industry. The relationships between transaction cost and the existing institutional framework further support the conclusion of Williamson (2000) and promote the suggestion that the timber industry should attempt to customise its environment in order to reduce cost. The industry is a major player in the economy and has the potential to lobby government with respect to regulation-property rights economics, favourable policy to reduce the cost of inputs, subsidies and reduced taxation-interest charges.

## **6.6 Do Smaller Farmers Generate Incremental Transaction Cost ?**

Agribusiness transactions in the timber supply chain include start-up costs, technical advice, the use of inputs, cane supply-delivery transactions and the administration of the suppliers in the company's financial accounting system.

### **6.6.1 Start-up Transactions**

In the case of medium and large scale suppliers, the start-up transactions largely revolve around the registration of the supplier contract. The process whereby a farmer, with a water license, applies to enter into a purchase agreement with Sappi Forest division begins with an application made by the farmer on the prescribed form. The evaluation of the application is initially done by the project manager before being further evaluated by the regional project manager. The application will then be forwarded to the resource manager of Sappi Forest who will approve or reject the application. If the application is rejected a response will be directed to the farmer applicant. If the application is approved it is re-directed to the project manager who will then ensure all the applicant's back-up data is obtained and the contract details are completed. The application is then forwarded to the contracts manager who checks the details and draws up the contract. The outline contract is then forwarded back to the regional project manager who checks the details, obtains the applicant's signature and forwards the signed document back to the contracts manager who prepares the final agreement pack. A copy of the agreement pack is then forwarded to the resources manager who inspects before passing on to the

logistics manager who, in turn, will forward to the environmental manager before returning to the contracts manager. Finally, the contracts manager will then forward the agreement pack to the fibre supply manager who will direct it to the managing director for approval. The agreement pack is then forwarded to the Sappi Division Board for final approval. Only then will the contracts manager instruct the conveyancers to register a bond and timber servitude on the newly contracted grower. The conveyancers will then register a bond and timber servitude with the deeds office whereupon the contracts manager will inform the resource manager, the project manager and the planning department. Some ten transactions are incurred by Sappi Forest in order to register a contract for medium-large growers in possession of a water license. Only at this stage will an advance be made by Sappi Forest division with respect to the establishment and growing costs of the prospective grower.

The start-up transactions for Project Grow farmers involve a number of incremental transactions. The registration of these growers is managed by LIMA, a rural consultant organisation, hired by Sappi Forest division to manage the affairs of the small-scale growers. The contracting procedure commences with an application for a water licence. An application form is filled in for the tribal area and the signature of the relevant tribal authority is obtained. The growers are then canvassed and a site visit is conducted, per grower, to evaluate the physical aspects of the site. A geographical position system (GPS) then takes a reading of the site co-ordinates and an estimate is made of the plot size. The grower application form is then completed and grower information is captured on the database system. This data is then transferred to an Excel type spreadsheet that is maintained for Project Grow. The farmer data is then forwarded to Sappi Forest for processing and Sappi Forest who then directs this information to the various authorities including the Department of Water Affairs (DWA), the Department of Environmental Affairs (DEA), the Department of Agriculture (DOA), the Kwazulu-Natal Wildlife and the AMAFA, a cultural heritage body. The application procedure by small growers on non- title land for a water licence thus requires a multiple application approach in order to satisfy the requirements of the National Environment Act 107 of 1998, the Environment Conservation Act 73 of 1989, the Kwazulu-Natal Heritage Act 10 of 1997 and the Conservation of Agricultural Resources Act 43 of 1983. LIMA, moreover, interacts with some thirty eight different tribal authorities, with respect to the

registration of new growers in the Project Grow area. Once the water license has been granted, LIMA checks the recorded data of the applicant, including the GPS coordinates of the new grower site, before confirming this information with Sappi Forest Division and commencing the contract registration process. The contract registration process for Project Grow farmers then follows the same procedure as for larger growers. The registration of a water license and the contract approval procedures involves some thirty transactions.

The start-up transactions for Project Grow suppliers exceed those of larger contract farmers for two reasons. Firstly, an incremental twenty transactions are incurred by Sappi-Lima to ensure the new grower has access to water rights and has the right to operate on traditional land. These transactions extend to a number of local and national authorities. Secondly, in terms of administration cost, the screening and registration of small-scale growers involves the same level of resources as larger growers. On the basis of the volume of transactions, small-scale start-up costs, in terms of administrative effort, are in excess of 300% more costly than larger growers. The incremental nature of small-holder start-up cost is further highlighted if this cost is levied against the actual tonnage of the individual grower.

### **6.6.2 Planting and Growing Transactions**

Medium and larger farmers are largely autonomous with respect to the growing of timber. Sappi Forest division is available for consultation and the fibre supply department, in particular, normally physically evaluates the contracted timber. These transactions are largely on an ad hoc basis however. Conversely, small-scale growers generate a high number of integrator-grower transactions. After the acquisition of a water license, the approved small-scale farmer is visited with a view to training them to prepare planting pits. After the necessary rain, seedlings, supplied free of charge by Sappi Forest, are transported to the sites together with fertiliser. The planting of seedlings then commences and a follow up visit is made by LIMA to assess the results. LIMA then processes a loan advance and a cheque is prepared per farmer for work done. These loan advances are batched by LIMA and forwarded to Sappi Forest for

authorisation. Sappi Forest then inspects this request and deposits the funds into a trust account.

The cheques are then distributed to the farmers who individually sign for them. A further GPS reading is taken to verify the co-ordinates of all the planted sites that have been initiated for the year and the results again forwarded to Sappi Forest for record keeping purposes. Each grower is visited at least twice per year and this increases to six transactions in the planting phase. Sappi Forest then also conducts annual grower audits and their extension officers frequently visit the growers after the trees have been established to provide assistance with weed control and the preparation of fire breaks. Some 800-1000 new sites are approved per annum. Lima also purchases fertiliser and chemicals and dispenses these from five different locations in the Project Grow area. Table 6.6 lists the Lima-Grower transactions for gum production. These transactions, generated by Lima's management of the planting and growing process, include all the technical, management and extension services offered to growers. The number of transactions have been calculated on the basis of 6 visits per farmer per year for the first year, 3 visits per farmer in the second year and 2 visits per farmer per year between years 3 and 8. The results indicate that micro-farmer transactions have increased from 600 in 1989 to 15 000 in 2001.

**Table 6.6: Planting-Growing Transactions**

Year	New Growers (G)	1 <sup>st</sup> Year G x 6	2 <sup>nd</sup> Year G x 3	3 <sup>rd</sup> Year G x 2	4 <sup>th</sup> Year G x 2	5 <sup>th</sup> Year G x 2	6 <sup>th</sup> Year G x 2	7 <sup>th</sup> Year G x 2	8 <sup>th</sup> Year G x 2	Total
1989	101	606								
1990	344	2064	303							237
1991	273	1638	1032	202						2872
1992	354	2124	819	688	202					3833
1993	243	1458	1062	546	688	202				396
1994	234	1404	729	708	546	688	202			477
1995	549	3294	702	486	708	546	688	22		6626
1996	778	4668	1647	468	486	708	546	688	22	413
1997	656	3936	2334	1098	468	486	708	546	688	124
1998	862	4436	1968	1556	1098	468	486	78	54	12
1999	764	3692	2586	1312	1556	1098	48	486	708	116
2000	1085	5154	2292	1724	1312	1556	1098	48	486	1490
2001	857	4598	3255	1528	1724	1312	1556	198	48	1559
Total	7100	39072	18729	10316	8788	7064	5752	4196	328	9715

Table 6.7 indicates that the total number of growers increased from 101 to 710 in the period 1989 to 2001. The number of planting-growing transactions per total farmer

decreases from 6 to 2.2 in the period 1989 to 2001. This is because the average age of the plantations has increased and the average number of visits for plantations between the age of three and eight years is two per annum. Similarly, the transactions per hectare per annum decrease from 9.1 to 3.7 in the period 1989 to 2001 as the average age of the plantations increases.

**Table 6.7: Smallholder Transactions Per Hectare**

Year	Cumulative Farmers	Cumulative Hectares	Transaction per Farmers per year	Transactions per Hectare per year
1989	101	66.5	6	9.1
1990	445	284.6	5.3	8.3
1991	718	417.8	4	6.9
1992	1072	560.9	3.6	6.8
1993	1315	693.8	3.0	5.7
1994	1549	828	2.8	5.2
1995	2098	1040	3.1	6.4
1996	2876	1449.7	3.3	6.5
1997	3532	1934.2	2.9	5.3
1998	4394	2537.2	2.6	4.4
1999	5158	3075.5	2.3	3.9
2000	6243	3648.7	2.3	3.9
2001	7100	4223.6	2.2	3.7

Once plantations are older than eight years the first coppicing cycles begin which further ensures that farmer visits are restricted to around two per annum. In 2001 over 18 000 tons of timber were delivered by Project Grow to the Saiccor Mill. In 2001, Lima incurred some 15 500 planting-growing transactions with the contracted smallholders. This high level of interaction translates into 3.66 transactions per hectare per annum. Conversely, the number of Sappi Forest division transactions per hectare for private commercial growers per annum is less than one. This would indicate a transaction cost differential in excess of 350% for company transactions involving small-scale suppliers as opposed to private commercial farmers.

### 6.6.3. Felling-Delivery Transactions

Harvesting operations for all growers commence when an order for timber is issued by Sappi-Saiccor mill. In response to this order a harvesting plan is drawn up by the Sappi Forest procurement office who then releases a procurement order for a specific tonnage of timber to be delivered. A sourcing meeting is conducted to identify the growers that will respond to the procurement order and to ensure the available timber is managed in a

sustainable basis. The order is split up into an amount to be supplied by own growers (SAPPI plantations) and contracted private growers. A questionnaire is sent out to the private growers and Project Grow and this is returned to the procurement manager indicating the growers who will comply with the order and the respective tonnage to be delivered. A list of own growers and tonnage is then produced by the regions, as well as, a list of private growers and tonnage. These lists are then discussed in a monthly meeting and checked with the conditions of the respective supplier contracts before the suppliers are notified to proceed. Sappi Forest will, moreover, indicate how it would prefer the timber to be delivered and for every order the supplier will indicate the split between the timber to be transported by road and rail respectively. The procurement office is now in a position that it can verify exactly what quantity of timber will be supplied by each grower, both own and private-project grow. This delivery schedule will then be forwarded to the mill manager and the timber control system department (TCS), operated by Sappi Forest division, will then initiate the printing of timber labels for each of the designated suppliers. Each label includes the full supplier details for accounting purposes and timber labels are printed for the expected tonnage. Sappi's own timber is allocated a label for every five tons.

Timber deliveries can be categorised as road deliveries from own plantations, rail deliveries from own plantations or rail and road deliveries from private growers. In the case of road deliveries from own plantations, the haulier retains a copy of the label as does the loading contractor and the barcode on the label is scanned by the weigh-bridge on arrival at the mill. In the case of rail deliveries from own plantations the supplier retains a copy of the label which is attached to the railway consignment note which, in turn, is placed in appropriate holders in the railway trucks. At the mill the weigh-bridge clerk removes the consignment note and scans the label and attaches the consignment note to the weigh-bridge ticket. A similar procedure is followed for larger contract growers delivering timber by road and rail. In the case of road transport a bar-code slip is issued by TCS per truck load and private suppliers must ensure that drivers hand in the label to the weigh-bridge for scanning on arrival. The procedure by rail for this category of grower is the same as own deliveries by rail. The TCS payment system is based entirely on the information contained on the labels adjusted for any deductions with respect to loans. Suppliers are monitored on a weekly basis using the TCS report



that checks actual volumes received compared to the volume indicated in the order generated by the procurement process. A month end remittance advice is prepared for each supplier, checked and authorised for payment. Any deductions, for loans and advances to the suppliers, are netted off against the timber payment after being calculated and checked by the regional project manager who initiates the deduction from the payment system. The deduction is also verified by the procurement manager and the resource manager before being passed on to the TCS department for processing in the month end remittance advice.

The harvesting of timber for Project Grow is differentiated from that of larger growers as follows. Prior to harvesting a field check by Lima is done to ensure the quality of the selected trees. Lima is also responsible for organising the felling and transportation of Project Grow timber. The services of a harvester, a shorthauler and a transporter are negotiated with each grower before contracts are entered into with the respective agents. Sappi Forest officials, if requested, also assist the negotiation of contracts with harvesters and transporters. Where access roads are required a survey of the roads is performed and, if viable, a contractor is hired to make roads and the cost is split between the growers whose income can be reduced by 50%. The harvesting and haulage of timber to the Sappi-Saiccor Mill is managed by LIMA who schedules the dates and quantity of timber to be harvested with every farmer on the basis of a harvesting schedule that is developed at the start of every season. Weigh-bridge tickets are issued weekly from Saiccor. The tickets are collected and checked by LIMA with respect to their number and sequence.

The procedure for timber to be delivered involves an extension officer performing the following checks. Firstly the farmer records are checked on the database before LIMA oversees a contract between the farmer and an approved contractor. This contract is handed in to LIMA before the issue of any weigh-bills by the extension officer to the grower who signs for them on receipt. These weigh-bills are only issued to approved contractors vehicles. The grower hands over the weigh-bill to the contractor for each load taken and where possible this load is verified by a LIMA official who will initiat the weigh-bill. At harvesting a weigh-bill docket is issued per load to a farmer and the weigh-bills issued on a weekly basis by the Sappi-Saiccor Mill are collected

The payment of all contractors and farmers is based on the timber delivered over the weigh-bridge and this payment is performed weekly for all the plots where harvesting and delivery to Sappi-Saiccor has taken place. Sappi-Saiccor mill also mails LIMA a full history of monthly weigh-bridge records. A monthly repayment of Sappi Forest loans to Project Grow farmers is made by way of a cheque to Sappi Forest that reconciles the total amount paid with the individual farmers. All this information is captured on the LIMA database. Additional transactions are occasionally generated as a result of the inclusion of non-contract timber that has been included in Project Grow deliveries to the Sappi-Saiccor Mill. In the future all harvesting-haulage contractors will be screened by means of an interview before their details are filed. A monthly harvesting report will also be generated to identify and investigate any abnormal yields and LIMA staff will carry out spot checks in the field.

Project Grow farmers appeared to generate incremental transaction cost in the harvesting operation because of the higher level of supervision that is involved. Lima is paid a fixed fee per ton, as part of their annual contract, to manage the harvesting and transport of Project Grow timber. The incremental level of transaction cost occurs because of the need to help farmers contract with harvesting-transport agents and to ensure that the necessary documentation is facilitated. Lima also ensures that the selected growers supply, and are paid for, the correct volume of timber and that the necessary access roads are available. By contrast, medium and large scale farmers, largely, do not need assistance from Sappi Forest for this activity and engage and pay for their own contracted services.

#### **6.6.4 Administration Transaction Cost**

A sample of growers harvesting-remittance administration transactions have been recorded in the Sappi Forest accounting system (TCS) for the year ended September 2000. The sample consisted of two Sappi estates, Braemar and Sutton, two medium sized growers, P. Hayter and Kevard Estates and a sample of Project Grow small-scale farmers. The Sutton Estate could be classified as a large grower whilst the Braemar Estate could be classified as medium-large. A record of accounting transactions

generated versus timber delivered is listed in Table 6.8. The transaction cost of administering grower records is reflected in terms of the number of accounting entries that are generated for the tonnage delivered. The records indicate that Project Grow farmers generate the highest level of administration cost per ton, followed by the Sappi Forest estates of Braemar and Sutton. Finally, the contracted medium sized growers, namely, P. Hayter and Kevard Estates, generate the lowest level of administration cost.

**Table 6.8: Grower Accounting Transactions**

Grower Name	Classification of Grower	Tonnage Delivered	Accounting transactions	Tons per transaction
Kevard Estates	Small-medium	5633.65	249 + 249 = 498	11.31
P.Hayter	Small-medium	7487.1	228 + 228 = 456	16.41
Project Grow	Micro	12805.31	3301	3.87
Braemar Estate	Medium-large	26841.35	740 + 3700 = 4440	6.04
Sutton Estate	Large	91258.9	3103 + 15515 = 18618	4.90
<b>Total</b>		<b>144026</b>	<b>27313</b>	<b>5.3</b>

Project Grow farmers appear to generate an incremental administration cost of between 26% and 56% in the Sappi Forest TCS system compared to the Sappi Forest estates of Braemar and Sutton. The incremental cost of Project Grow farmers, however, is even more apparent in relation to contracted medium size growers. Project Grow administrative cost exceeds that of the medium growers, namely, Kevard Estates and P.Hayter, by 282% and 424% respectively.

In addition to the Sappi Forest TCS system, LIMA incurs incremental administration cost with respect to the Project Grow farmers. These costs include the administration of fertiliser and chemical accounts and advances received or loan repayments made. LIMA maintains a full time clerk and a half day bookkeeper to work permanently on Project Grow administration requirements. LIMA also maintains a separate database and two bank accounts for the project. Fertiliser and insecticide stock logistics are administered at five separate depots. Records are maintained for each grower on the database system. These records include the grower particulars, the issue of seedlings-fertiliser-insecticide, loan cheques issued, visits made, harvesting rates and contractors and a record of remittances. Project Grow farmers, moreover, receive periodic payments when certain growing activities are completed and individual accounts are maintained.

that track monies owed to or payable by each farmer. A bi-annual bad debt survey is also made and each year records of harvested growers are archived. The first bank account, namely, harvesting, is reconciled monthly and a record of monthly transactions with contractors and farmers is reconciled with the Sappi TCS system. The second bank account, namely, advances, is also reconciled monthly per grower plot number and a monthly reconciliation with the Sappi control figures is performed against the Payment Summary Report. The administration of Project Grow affairs is, therefore, partially duplicated and involves the resources of both Sappi Forest division and Lima. Conversely, the administration of Sappi plantations and all other contracted growers is undertaken by Sappi Forest division only. Project Grow, therefore, demonstrates a higher level of administrative transaction cost than both the Sappi plantations, Braemar and Sutton, as well as, the medium-large growers, Kevard Estates and P Hayter.

#### 6.6.5 A Comparison

The results suggest small-scale growers generate higher levels of transactions cost than larger suppliers. The primary reason for the incremental level of transaction cost is caused by differential levels of start-up cost, growing-felling-delivery costs and the administration of growers affairs. Medium to large contracted growers, largely, self develop their capacity to operate as timber growers whereas the development of the Project Grow program has cost Sappi Forest division in excess of R 10 million. This project, moreover, has required nearly a decade of committed inputs. Periodic payments have also been made to the growers to ensure the continuity and cash flow of small-holder operations. Smaller growers also generate differential levels of growing costs because of the high levels of visits from Lima officials. Larger growers, by contrast, maintain their own timber and are only visited on an ad hoc basis by Sappi Forest division. Larger growers are also responsible for the felling and transport of their timber to Sappi-Saiccor whereas Lima arranges these operations for Project Grow farmers. Finally, the administration transaction cost of small-scale farmers appears to be greater than larger growers because of the smaller volume of deliveries allied to greater use of company inputs. On the basis of the results, this study concludes that the managed small-scale growers generate more transaction cost than larger suppliers and that Sappi Forest acquires timber at a less transaction cost from larger suppliers. The incremental cost of

dealing with smallholders also appears to generate frustration for the Sappi Forest division as a result of the higher level of problems, increasing levels of rural theft and violence and lack of access to certain areas.

## **6.7 Small-scale Grower Production Efficiency**

A range of gum growers were selected in order to evaluate the comparative cost performance of company estates compared to private growers, small farmers and provincial and national statistics. The company estates include the Sappi Forest regions of Umkomaas and Richmond. The cost data used are the result of a benchmarking exercise conducted between 1997 and 2001. The cost data have been restated in terms of 1999 prices and averaged. The cost data for medium size contracted growers include the results of a workshop held in May 2001 where the results of 61 000 hectares of farmland were consolidated. The Project Grow small-scale farmer cost data are the result of an analysis of the performance of 98 farmers between 1991 and 2001. Lastly, general data for Kwazulu-Natal and South Africa, also restated in terms of 1999 prices, have been included for comparative purposes. The growers all supply the Saiccor Mill and are located within a 25-75 kilometre radius of this processing unit.

### **6.7.1 The Financial Analysis of Plantations: Accounting Methodology**

Plantation forestry may be seen as a permanent crop with a portion of the plantation harvested each year to generate an annual income that should cover the cost of re-establishment, as well as, the maintenance and overhead expenses of the whole plantation. This study has assumed that each crop is a long term cycle that generates a sustained annual yield, called the mean annual increment, which may or may not be felled. Many factors can cause an imbalance to the years felling program but the assumptions adopted see this variation as effecting cash flow and not the inherent profit potential of the plantation. Under-felling, in any one accounting period, will therefore reduce cash flow for that period whilst over-felling will achieve the opposite. Felling more than the mean annual growth of a plantation generates a surplus cash flow in the short term which should not be confused with higher profits. In fact, continued over-

felling erodes the growing stock and eventually produces a shortage of mature trees for felling.

The establishment costs include planting, fertilising and coppice thinning annualised over the planned rotation period of approximately nine years. Tending costs include weeding, pruning, clearing damaged trees, thinning and marking annualised over the planned rotation period. Fire protection costs are incurred annually for the protection of plantations, insurance, conservation and the control of pests and weeds. Overhead costs are also incurred annually and include road maintenance, building maintenance, maintenance of improvements, administration and community development. Harvesting costs are the annual costs incurred for motor-manual clear-felling, mechanical clear-felling, debarking and extraction to roadside. Finally, transport costs are the annual cost of loading and haulage from the roadside to the buyer where a range of road-rail hauliers are contracted to perform this service.

#### **6.7.2 Grower Performance**

The data comparing the grower performance is displayed in Table 6.9. The grower results indicate that contracted medium-large growers are the most competitive category of timber farmer followed by the Project Grow farmers and the Sappi Plantations. The Sappi plantations of Umkomaas and Richmond appear to grow timber at approximately the same cost as the Project Grow farmers. All the Sappi growers, moreover, appear to grow timber at less cost than the provincial and national statistics for eucalyptus production. Contracted medium-large growers' operating costs are some 12.2% to 13.6% below Sappi Plantation costs and 18.2% to 18.5% below the regional and national average largely because of lower forest protection costs, competitive tending costs and lower overhead costs. Contracted medium-large farmers also reflect overhead costs that are 13.1% to 21.5% lower than Sappi Plantations and 31.5% to 32.5% lower than the regional and national averages. The principal reason for the competitive overhead cost structure of this category of grower is because many services-facilities are contracted for rather than internalised like the Sappi plantations. These services include agronomy, extension, felling and delivery. Project Grow overhead costs by contrast, appear to be as high as the Sappi plantations, despite the fact that a major

of forestry services-facilities are contracted for Project Grow s overheads, m re ver could be understated as a result of not including certain Sappi Forest overhead costs

**Table 6.9 Comparative Grower Performance**

Grower Cost and Revenue Data	1. Umkomaas	2. Richmond	3. Med.-large	4. Project Grow	5. Natal	6 SA
Mean Annual Increment	12.90	13.10	19.15	11.00	13.8	14.8
Planned Age at Clear-felling	10.00	10.00	8.9	9.1	9.3	9.7
Actual tons	99683	219531	569115	4583	1554823	4322.4
	R/ton	R/ton	R/ton	R/ton	R/ton	R/ton
Selling Price	225.21	224.47	190.75	191.0	223.41	229.54
Establishment	8.19	11.01	9.31	N a	12.3	14.43
Tending	11.07	7.58	8.92	N a	12.59	12.33
Forest Protection	23.08	20.57	11.15	N a	18.33	18.11
Harvesting	39.04	38.83	42.27	N a	4.91	38.4
Transport	50.33	55.99	43.99	N a	58.14	1
Operating Cost	131.71	133.98	115.64	131.0	142	141.9
Overheads	39.13	35.33	30.70	36.00	45.51	44.85
Total Production Cost	170.84	169.31	146.34	167.00	187.51	8.84
Net Profit	54.37	55.16	44.41	24.00	35	22.7
% of Total Cost	%	%	%	%	%	%
Establishment	4.8	6.5	6.3	N a	6.4	7.7
Tending	6.5	4.4	6.1	N a	6.7	6
Forest Protection	13.5	12.1	7.6	N a	9.8	8.1
Harvesting	22.9	22.9	28.9	N a	21.8	2.6
Transport	29.5	33.1	30.1	N a	31.1	33.0
Operating Cost	77.1	79.0	79.0	78.0	75.7	7.1
Overhead	22.9	21.3	21.0	22.0	24.3	24.0
Total Production Cost	100	100.0	100.0	100.0	100.0	1

1 & 2 Average Cost for 1997-2000 at 1999 Prices

3 Results of May 2001 Workshop covering 61 000 hectares Prices restated to 1999

4. Results for 98 Project Grow farmers within a 50 km radius of Saccor between 198 -2 01

5 & 6 Results for 1999 Calendar Year

\*excludes interest levied on R10 million

Project Grow expenditure may also be understated as the cost of family labour is not necessarily reflected and the cost of any operations that have been self financed have also been excluded. On the basis cost efficiencies, however, Project Grow farmers do not appear to be as competitive as medium-large growers but appear to enjoy a similar level of cost efficiency as the Sappi plantations whilst outperforming the regional and national averages. The limited nature of the Project Grow cost data, however, would suggest that further cost comparison studies should be undertaken

## 6.8 Have Small-scale Growers Overcome the Barriers of Entry ?

Project Grow farmers delivered some 18 000 tons to the Sappi-Saiccor timber supply operation in 2001/2 . The sale of timber, moreover, generated R2 6 million in revenue for the growers in this period with an estimate of R3 5 million projected for 2002/3 . Linkages effects in the region reveal that Project Grow activities have resulted in the employment of 1120 people by contractors who assist the growers with the planning and harvesting of their plots. The project has also contributed towards the upliftment of women in this area as some 80% of the growers registered with the project are female . The project, moreover, generates considerable revenue for local communities with an estimate of 50% of turnover retained within the community as a result of payments to local contractors, 42% retained by the grower and 8% refunded to Sappi Forest as loan repayment. Despite these benefits to the community, however, it is doubtful whether the individual growers could be classified as emergent commercial farmers . The individual timber lots are mostly less than one hectare, operate under conditions of traditional land tenure and do not constitute the major source of income for the family farm . The small-scale grower operations are, moreover, almost entirely managed by Lima who, in turn, are funded by Sappi Forest division. The continuity of Project Grow is almost entirely dependent on the support of the Sappi Forest division. The withdrawal of the Lima management inputs, in this respect, would seriously jeopardise the continuity of the project in its present form. The current level of Sappi inputs has allowed this category of grower artificial access to the timber industry on an economic return basis . The results confirm that large numbers of micro farmers can be linked to agribusiness as a result of a contracting arrangement. This study, however, cannot suggest that the Project Grow contracting arrangement has allowed small-scale farmers to overcome the barriers of entry to the industry on a permanent basis. Despite this negative conclusion, Project Grow demonstrates that pro-active engagement by agribusiness can create opportunities to engage smallholders in agricultural supply chains.

## 6.9 Summary and Conclusion

The results of the case study, with respect to the first research question, suggested that the transaction characteristics of the timber supply-processing operation influenced the



level of managed co-ordination required. These results support the results obtained in the previous case study. The high levels of frequency-asset specificity, combined with a certain measure of uncertainty, indicate that Sappi-Saiccor requires high levels of managed co-ordination to synchronise the timber supply-processing chain. The results also demonstrate that the open market would not be able to support the logistics of the input-output function. Whilst it can be confidently demonstrated that the transaction characteristics influence the minimum level of managed co-ordination, it is more difficult to assess the same relationship with respect to the maximum level of managed co-ordination. The reason for this is that fully integrated structures, while being capable of co-ordinating the respective activities, might incur higher levels of bureaucracy cost, that could contribute towards the unsuitability of this governance structure. This study has demonstrated that the choice of a governance structure to co-ordinate the timber supply operation can employ transaction theory to complement its other design techniques.

The results of the case study, with respect to the second research question, suggest that the prevailing institutional framework has exercised considerable influence on the transaction cost structure of the timber industry. Despite, the qualitative nature of the arguments developed, the usefulness of this finding is that management can consider alternate ways of reducing transaction cost as a result of a better understanding of causality. Williamson (2000) suggests that the firm should attempt to shape institutional costs before matching organisation structure with the prevailing transaction characteristics. The timber industry, a major player in the South African economy, has the necessary political strength to lobby for policy that can reduce transaction cost.

The results of the case study, with respect to the third research question, demonstrated that small-scale farmers generate higher levels of transaction cost than larger growers. This is demonstrated in all phases of the timber production cycle. The results also demonstrated that a high differential level of transaction cost occurs in a majority of the Project Grow activities, from the planting-growing phase through to the incremental cost of administering the grower affairs. The results of testing this research question can be usefully employed in not only identifying the different cost elements of transaction cost, but also the reasons for the differential level of small-scale farmer cost. These results

form the basis of a series of proposals to reduce small-scale farmer transaction cost, as well as the design of suitable control systems. Transaction cost, by being clearly identified, can form the basis of redesigning contracting arrangements with small-scale growers or, alternatively, be used as a basis to influence government policy to introduce special relief for agribusiness start-up costs that support contracted small-scale suppliers. Alternatively, incremental transaction cost could be charged back to farmers used as a basis to organise smallholder operations into larger business units or to lobby for support.

The results of the case study appear somewhat inconclusive with respect to the fourth research question because of the lack of detailed smallholder costing records, but suggest that if small-scale farmers can reduce overhead costs, they will be able to compete successfully with other contracted medium-large suppliers and the company plantations. A reduction in overhead cost could possibly be attempted by the formation of a farmers' association to eventually replace the Lima management structure and to represent the interests of the individual members. By comparison, contracted medium scale suppliers appear to be the most cost efficient growers of timber in terms of both operating cost and farm overheads and the management of overhead costs appears to be a critical cost element. One of the principal reasons for the higher levels of small-scale growing cost, appears to be the excessive cost of managing the individual farmers who, on average, farm 0.6 hectares each. The Sappi Forest Division, despite carrying a high level of facilities costs, demonstrates similar levels of overhead cost per ton to Project Grow. The results of the study can be used as a basis to design alternate smallholder management structures and, perhaps larger smallholder operating units in order to foster higher levels of cost efficiency.

The results of the case study are also somewhat inconclusive with respect to the fifth research question because the case study has not clearly demonstrated that small-scale farmers have overcome the barriers of entry to the timber industry on a sustainable basis. Without the extensive support and start-up cost incurred by the Sappi Forest division the Project Grow operation would never have become functional. At best the case study has demonstrated that Project Grow farmers, as a result of the high levels of start-up cost and support, are accommodated in the Sappi-Saiccor timber supply operation. The

principal benefit of the case study is a better understanding of the pitfalls and costs that agribusiness integrators can incur when embarking on small-scale contracting projects. More specifically, the case study demonstrates that permanent growers in the supply chain need to operate as viable business entities. Whilst support in the start-up phase is a necessary pre-requisite to overcoming the barriers of entry, the contracted farmers need to be weaned out of the company structure on a long term basis. The Sappi-Saiccor case study is useful because it can be used as a basis to estimate the cost of ensuring that small-scale farmers overcome the barriers of entry. Finally, the results of the case study with respect to all five research questions, are incorporated in the design of a smallholder contracting model in Chapter Seven.

In conclusion, the Sappi Forest Products division appears to be both an efficient grower and processor of timber within the confines of the Saiccor-Supply Chain. It has been suggested, at corporate level, that Sappi core skills lie as a processor of timber rather than a grower. This argument would suggest the possibility of the Sappi Forest Products division unbundling its timber growing activities. In this respect, whether or not the Sappi Forest Division is fully internalised in the company operations, a very high level of managed co-ordination would be required to comply with Sappi-Saiccor timber requirements. It would appear unlikely that contracted medium and large growers can significantly expand their current level of supply and Project Grow, at this stage, supplies less than 1% of the mill requirements. Sappi Saiccor is, therefore, vitally reliant on the Sappi Forest Division and the future ownership-management of these activities will play a strategic role in the long term performance of the dissolving pulp industry. On the basis of the results, this study would suggest that Sappi Forest plantations should not be unbundled, and if they are, they should be developed for medium-large growers in the industry. An important strategic perspective will be to lock suppliers, not only into the timber industry, but also to remain suppliers of Saiccor-Sappi only.

Small-scale grower supply models, one of the only potential sources of expanding timber supply, need to be developed in a more efficient manner than the Project Grow model. A number of challenges face the expansion of this sector. Firstly, the paternalistic nature of the relationship between Sappi Forest and Project Grow is unlikely to contribute towards the commercialisation of this category of grower. Ideas

each grower should be entrepreneurial and a climate of free loans, combined with high levels of company inputs, is unlikely to develop this category of farmer. The vital issue of institutional capacity building is a challenge to government, NGOs, local communities and the relevant corporate partners involved and local communities need to develop their own institutions to engage in the modern economic sector. Project Grow farmers could consider operating under the umbrella of a farmer's association. The role of tribal authorities, local government and land tenure need to be resolved together with a wide range of gender issues.