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## **Sawmills in Ecuador: A Study of Small Sawmilling Enterprises in the Province of Pichincha**

By

Cressida McKean

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SAWMILLS IN ECUADOR

A STUDY OF SMALL SAWMILLING ENTERPRISES

IN THE PROVINCE OF PICHINCHA

D R A F T

Cressida McKean

May 1986

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## INTRODUCTION

In Ecuador, as in many developing countries, one of the difficulties with studies of small manufacturing firms is that the focus is often on groups of enterprises based principally on their size, rather than on their industrial sector as well. (1) The objective of this study is to assess the growth constraints and potential of small sawmilling enterprises in the context of a specific industry. Industry structure analysis may be a more valuable means to assess growth in small firms than cross-section surveys of firms in a diverse group of industries.

Many studies group together diverse groups of small enterprises in variety of industries. This tendency may reflect the approach of the programs and organizations which have developed in support of small enterprises. Legislation designed to promote the development of artisans and small industry targets a heterogeneous group principally to direct assistance to those which have previously been denied support. As well, the establishment of chambers of small industry or artisan associations inevitably group together garment manufacturers, food processors, sawmills, among others. This uniting of enterprises does have a purpose in creating a political power base for small industry or artisans as a group.

I have approached this analysis of growth constraints and potential of small sawmills by first examining the structure of the industry, and then considering the reasons for the fragmentation characterizing the industry in Ecuador. Subsequently, I examine the population of sawmilling enterprises surveyed for this study. This includes the "mountain sawmills" or primary processing sawmills; and secondary processing sawmills, both in the province of Pichincha.

The primary competitive forces in the industry are then analysed from the perspective of the small sawmills. Industry structure analysis identifies the following as the principal competitive forces to be used as a basis of analysis: the threat of new entrants, rivalry among existing firms, the threat of substitute products, the bargaining power of buyers and the bargaining power of suppliers. (2)

This analysis is then followed by a discussion of a strategy for upgrading sawmilling enterprises and recommendations for development assistance.

#### METHODOLOGICAL CONSIDERATIONS

Sources of information for such an industry analysis are few and incomplete. They include recent studies on the wood-processing industry, on small manufacturing and on

artisans. Statistical information is extremely limited. The national statistics and census institute further broke down data gathered in the country's 1980 economic census. However, the census information on enterprises with less than 10 employees is based on a sample and not on a fully developed directory. Supplementary surveys by private organizations have been carried out on small wood-processing enterprises for various provinces. However, these surveys combine saw mills and furniture enterprises, which limits the value of such information for an industry analysis.

To supplement these written sources, interviews were personally conducted with dozens of industry informants. Those interviewed included managers of large, medium-sized and artisan wood products enterprises; suppliers of wood-working machinery; commercial intermediaries; technical specialist observers of the industry; bankers; Ministry of Agriculture and Forestry department officials; representatives of the chambers of small industry and the association of industrialists in the wood industry; and others.

For a data base on a specific group of small firms, I designed and personally carried out a survey of 26 owner-operators of small sawmilling enterprises in the Pichincha province. My attention was directed principally to two sets of sawmilling firms, the "mountain sawmills" and the urban

deposits, which carry out secondary processing. The sample of mountain sawmills included 14 firms, while the sample of urban deposits included 12 firms.

I restricted my study principally to those sawmilling enterprises with an average of ten or fewer workers. I chose not to restrict myself only to "small industry" as defined in the Law for the Promotion of Small Industry and Artisans. Most of the mountain sawmills are not registered with the Chamber of Small Industry of the Province of Pichincha, even though their asset level suggests that they should be registered as "small industries." The majority, however, are registered in the Nucleus of Small Wood Industries of Santo Domingo.

To attempt to develop a relatively representative population of small manufacturing firms, I relied on a diversity of sources. These included the 1985 Directory of the Ecuador's Ministry of Industry and Commerce of firms registered under the Law for the Promotion of Small Industry and Commerce; a list developed by an Ecuadoran research and technical assistance on the small wood-processing industry for their survey; the 1983/84 listing from the Ministry of Agriculture Census on Wood-Processing as well as contacts provided by the local Forestry Department officials and word of mouth for the names of additional enterprises of the same approximate size.

My decision to concentrate the survey in one industry in one major province was based on the belief that a focused regional analysis would yield the most information. Time and finance were also limited, but the principal reason was that a more widely dispersed population would have increased the difficulty of developing a coherent information base. It would have been too dispersed to establish an understanding of the relationships between producers and buyers; producers and competitors; producers and suppliers.

The data base was developed with two principal objectives. First, the questionnaire was designed to provide information about the structure of and the effect of various competitive forces in the industry, from the perspective of the small producer. It was also designed to gather specific information about the enterprise itself: its products; its production process; its sales ; its labor force; among other factors to assess its growth potential in the given environment. Second, the extensive interviews with informants was intended to supplement this data base to develop sufficient information for an industry analysis.

The data base's principal limitation is the lack of reliable information on the volume of lumber used and processed. The great diversity of methods for measuring lumber and the lack of standardized norms complicated the

collection of data in this area. Also, the seasonality characteristic of the industry makes data on production costs and sales difficult to analyse.

It was a considerable advantage to complement the survey with extensive interviewing of industry informants. This gave the information gathered in the survey of the enterprises themselves a broader, more industry-specific perspective. Factors influencing the firm, such as the extensive use of contractors or the role of the large wood panel manufacturers in lumber supply, could be best analyzed in terms of the structure of the industry.

## THE STRUCTURE OF THE SAWMILLING INDUSTRY

Ecuador's sawmilling industry is not a modern, efficient lumber industry, with significant backward and forward integration. Rather, production is primitive. Primary processing takes place independent of secondary processing. In effect, different stages of production are carried out by different groups of firms.

Several types of production units carry out the primary processing of timber, the transformation of tree trunk into construction blocks ("piezas") or sawnboard ("tablas"). The majority are small, primitive artisan sawmilling operations, usually located near the site of timber supply and commonly referred to as "mountain sawmills."

Approximately forty-five to fifty percent of the sawn wood supply is carried out by individual chain saw operations, employing one to three persons. These chain saw operators do not merely fell the tree and remove the branches, but they often carry out the primary processing, transforming logs into wooden blocks or boards. (3)

Another primary processing enterprise are the mobile sawmills which use a transportable circular saw, which is set up at the source of timber supply and then moved to another forested area, as the timber is exploited. In other cases,

these mountain sawmills are stable enterprises which use the circular saw, but they have an established base of operation in a relatively populated locale and occasionally a complement of heavy forestry equipment, transport, or secondary processing machinery.

The next stage is the transport of the lumber to prospective purchasers. The artisan sawmills, which include the chain saw operators and most of the circular sawmills, do not have the capacity to market and transport their production to centers of secondary processing, warehousing or further industrial use.

The lack of integration in the industry, the small size of the production units, and the high transport costs involved have encouraged the extensive use of intermediaries. Commercial intermediaries are integral to the structure of the sawmilling industry in Ecuador. These intermediaries are primarily independent commercial truckers supplying urban lumber deposits or industrial enterprises requiring sawn board wood, such as manufacturers of parquet, furniture, broom handles, or packing cases. However, some intermediaries are contracted directly by firms requiring particular types or sizes of lumber.

In other cases, employees or managers of firms requiring lumber, such as deposits, buy directly from the mountain

sawmill and transport the lumber back to the firm. By assuming a direct role, they are seeking to recoup the margin gained by the intermediaries. The large plywood manufacturers use logging contractors in a similar way to reduce their dependence on independent truckers as a source of supply of sawn board wood.

These intermediaries play an important role, principally because they are able to purchase lumber from a variety of sources. They buy from chain saw operators along the roadside, from the managers of mountain sawmills using stable circular saws, or directly from the "colono" or rural peasant selling his timber which involves contracting others to carry out the processing.

Further down the wood processing chain are the lumber deposits or warehouses, which carry out the secondary processing of timber. These firms receive lumber from commercial truckers, independent intermediaries or individuals which they have contracted. They carry out such processes as edging, planing, dovetailing, sanding, drying, and occasionally chemically treating sawnboard. These secondary processing operations tend to be small industries or artisan operations, located in major urban areas. In turn, these deposits supply the construction industry, which includes architects, building companies, carpenters, among others.

Apart from direct participants in the sawmilling industry discussed above, there are several indirect participants with a critical influence over the structure of this industry. Industrial wood manufacturers, which include the plywood and particle board industry, play an important, though indirect, role in the development of the sawmilling industry. These manufacturers have a predominant presence in the wood industry in Ecuador as a whole. (4) The wood products industry is characterized by a high level of concentration, with a small number of firms controlling from 50 to 95 percent of the market for plywood and particle board. (5)

These manufacturers require a very large volume of high quality timber and in turn have directed substantial attention to developing secure long-term suppliers. Also, while the majority are softwood plywood producers requiring tree trunks for panels, several firms manufacture a type of industrialized wood which uses sawn board wood as a principal input. (e.g. "listones"). Their extensive involvement in the exploitation of timber nationwide through the use of commercial truckers, logging contractors or their own work force has brought them into direct contact with sawmilling operations.

The wood panel products manufacturer and the sawmill

operator, as well as the commercial intermediary, can have a complementary or competitive relationship. Oftentimes, the logging contractor for the large industrial panel manufacturer prepares the transport routes, opens up virgin forest areas, and leases forestry tractors already in the area to sawmill operators or their intermediaries to allow them to exploit the timber which they are not able to use.

In other cases, the contractor for the wood panel firm and the sawmill operator compete for the best quality timber. Most of the time, the representative of the large industrial operator can pay a higher price than the sawmill operator, or the commercial intermediary. (6)

The concentration and the sizeable timber requirements of the large industrial producers place them at a considerable advantage relative to the small sawmilling operators and those intermediaries, serving the urban-based deposits.

#### **FRAGMENTATION IN THE SAWMILLING INDUSTRY IN ECUADOR**

A principal characteristic of fragmented industries are low overall entry barriers. The most obvious indication of the low entry barriers is the size of competitors in the industry.

**Table No. 1**  
**Sawmilling Enterprises and Planing Workshops (CIIU:3311)\*:**  
**The Provinces of Pichincha, Esmeraldas, and Guayas**  
**By Number of Employees and Asset Levels**

Number of Employees	Number of Establishments	
	Pichincha	Three Provinces
From 1 to 4 Employees	564	693
From 5 to 9 Employees	71	138
From 10 to 19 Employees	14	38
From 20 and More Employees	15	29
<b>Total</b>	<b>664</b>	<b>898</b>

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Asset Level*	Number of Establishments	
	Pichincha	Three Provinces
Under US\$18,500	449	594
US\$18,500 > US\$37,000	103	137
US\$37,00 > US\$185,000	98	126
US\$185,000 > US\$370,000	4	21
US\$370,000 and over	10	20
<b>Total</b>	<b>664</b>	<b>898</b>

\* In Ecuador the Standard Industrial Classification code is CIIU, and the number referring to Sawmills and Planing Workshops is 3311.

\*\* These figures have been converted to US dollars at the 1980 rate of exchange of 27 sucres to the dollar.

Source: *Census Economicos, 1980*, Instituto Nacional de Estadística y Censos (INEC); Above Information compiled with the kind assistance of Dr. Alberto Moyano of INEC. Table Prepared by Cressida McKean.

As the table indicates, the sawmilling industry is populated by many small-sized firms with relatively low levels of assets. Studies of the sawmilling and wood products industry confirm the view that sawmilling is characterized by numerous units of low productivity and primitive, obsolete technology. (7) The average number of employees in sawmills (both primary and secondary processing) is seven persons per unit of production, according to a recent study on the wood industry. (8)

In addition, sawmills are noted for their low levels of seller concentration in studies on industrial structure in developing and developed countries. (9) In the United States, for example, sawmills and planing mills, in general, were cited as illustrative of a fragmented industry. The total market share of the top four firms was 18 percent, which suggests a low level of seller concentration, according to the 1972 Bureau of the Census figures. (10) A 1977 study of the U. S. wood industry also indicates that sawmills and planing mill are low in concentration, with the four of the

largest companies responsible for 17 percent of the value of shipments, and the eight largest responsible for 23 percent. (11)

Entry levels in primary processing of timber in Ecuador are extremely low. Primary processing of lumber has customarily required the use of a large circular saw operating on a diesel engine or the use of several gasoline-operated chain saws. The capital investment needed to purchase a used circular saw is US\$800 to US\$2,000 (or US\$8,000 for a new saw), or approximately one hundred dollars for a chain saw. (12) Therefore, the capital requirements are minimal. Experience is also not a major constraint, evident in the large number of unskilled peasants who become chain saw operators.

Entry barriers in the secondary processing of lumber are also low. The asset and skill requirements are somewhat higher in these deposits, given the need for at least three heavy woodworking machines and a more complex production process. Informed observers estimate that the number of urban deposits in Ecuador which carry out secondary processing of lumber have more than doubled since 1980, and that the majority of the new entrants are artisans. (13)

A factor which has contributed significantly to fragmentation in the sawmilling business is the lack of a

consistent assured supply of raw material, timber. "The principal reason for low productivity in mountain sawmills is the impossibility of supplying the sawmills on a continuous basis throughout the year." (14) This conclusion of a FAO expert in a 1976 report on Ecuador's mountain sawmills is even more apt today. In Ecuador, the increasingly limited supply of timber is consistently cited as a critical problem, by sawmill managers and industry observers.

The weather is a particularly critical factor influencing the continuity of timber supplies. In winter, exploitation of timber supplies in much of Ecuador is nearly impossible. Approximately 70 percent of mountain sawmills surveyed worked less than a full year, usually six to nine months, largely due to the lack of an adequate supply of timber. A number of mountain sawmills do not plan for those periods when timber is not available. (15)

This fluctuation in raw material supplies discourages economies of scale in the sawmilling industry. Large firms will have more difficulty scaling down production in response to inadequate timber supplies than do small firms. A larger sawmilling operation with a band saw or a gang saw may be more efficient than a small circular sawmill, but the problem is volume. If the small sawmilling operations have difficulty in being assured of consistent raw material supplies, the larger volume sawmilling operations will most likely have

difficulty.

The experience of the introduction of band saws into Ecuador over the past decade suggests that this fluctuation in raw material supplies and the burden of high transport costs are important factors discouraging economies of scale in the industry. Five sawmilling operations which have attempted to use band saws to develop large scale primary processing capability have gone bankrupt; only one of the five is still in operation; it is based in Monticristi and managed by the firm CREART. (16)

In two cases, one in Pichincha and another in Guayas, the major problem was the lack of a steady raw material supply, specifically due to the distance from the source of timber and the volume of raw material required. In each case, the firms were built with too large a volume of production and too far from the principal areas of raw material supply. (17) The lack of a secure supply of raw material and the high transportation costs of supplying the firms outweighed the benefits of creating economies of scale with band saws in these cases.

Economies of scale are limited in the sawmilling industry for another reason. The fluctuations inherent in the construction industry, a principal buyer, affect sales for lumber produced by sawmills. As Graph No. 1, Projected

Building for the Period 1967 to 1984, demonstrates, the fluctuation of activity in the construction industry in Ecuador is considerable. Logically, trends in the industry will affect the buyers and their purchasing power of inputs, such as lumber beams, floor boards, moldings.

Mountain sawmills are loath to leave the industry. Exit barriers are high. The locations of much of the country's timber supply are areas of high unemployment or underemployment, far from major urban areas. They are areas in which the other primary occupations are agriculture and livestock; for peasant farmers, there is considerable attraction to sawmilling, principally because it yields more income than subsistence agriculture. Buyers of construction "piezas" or "tablas" are numerous and available; truckers wait along the roadside to purchase lumber. In addition, in the Santo Domingo area, the resale value of sawmilling machinery is negligible. (18) Therefore, recouping one's investment based on liquidation of assets is not profitable in the current environment.

Given the large number of artisans in the industry, primary processing of lumber is a low profit business. The chain saw operator's negligible overhead costs and their capacity to cope with fluctuations in sales have been a source of comparative advantage. But their presence has brought down significantly discouraged entry. (19)

Profits for primary processing have also declined for stable mountain sawmills due to the sharp rise in competition in the industry. In the Santo Domingo/Puerto Quito area, price cutting is commonplace. (20) The fact that many of the producers of board wood are artisans and former peasants suggests that their principal motivation in establishing their sawmilling operation may be to provide for their family and to ward off unemployment. Growth is not the incentive; survival is.

#### **GROWTH TRENDS IN CONSTRUCTION AND WOOD INDUSTRY - FACTORS SUSTAINING FRAGMENTATION IN SAWMILLING**

The slump in the construction industry, the national recession, and the severe decline in industrialized wood industry have had a major influence on production levels in the sawmilling industry in Ecuador.

The volume of projected building construction experienced a substantial rise in the early 1970's. Construction grew at only 1.4 percent annually on an accumulated basis in the 1974 to 1981 period. By 1981 and more significantly in the 1983-84 period, construction activity came to a standstill. In 1983, construction production dropped by 12 percent. (21) In 1984, 70 to 80 percent of the construction industry was paralyzed, in the

view of several knowledgeable industry observers. (22)

The recession in 1979 and its worsening in 1982-1983 were major factors affecting the construction industry in this period. Government austerity brought about a decline in public and private construction projects. There was also a substantial increase in the price of construction materials. (23) In addition, a number of private construction firms contracted substantial debt in dollars. The devaluation of sucre greatly increased the financial burden of servicing the dollar-based debt.

In fact, some informants affirm that the building industry is effectively dead. The extent of dollar loans for major construction projects was so significant that many such projects are not able to be completed, given the rise in the loan servicing requirements following the devaluation. (24)

The wood industry also went through a very severe recession in the early 1980's. In 1983, production in the wood industry dropped by 21.3 percent. The plywood and particle board industry, which had been developed principally to serve a regional market, lost their primary buyers in Venezuela and Colombia in late 1982. (25)

The current situation in the wood industry is one of

excess supply, a lack of sufficient demand. Stock levels of particle board and plywood are exceedingly high, which represents a significant cost to manufacturers. The situation in the wood industry has reached almost crisis proportions. Of the seven major plywood manufacturers in the country, three are profitable, while the other four are losing money or are bankrupt. Of the five particle board factories, only one is operating on a year round basis. Overall, wood industry profits in 1982 were double what they are in 1985, in the view of several knowledgeable industry observers. (26)

With the excess supply, prices of plywood have dropped 10 percent, while inflation remains at 25 percent. The situation is paralleled in the sawmilling industry. In 1985, there was an excess supply of low quality wood, largely reforested laurel, which has encouraged the price of sawnwood to drop to very low levels. (27) As a result, profits remain low and production stagnant in the sawmilling industry, according to knowledgeable industry observers.

The production levels of sawnboard in cubic meters has grown annually by 2.3 percent on average from 1974-83, a rate substantially below the ten percent rate of industrial production growth in the same period. In 1983, however, the rate of production growth slowed to a 1.5 percent rise relative to 1982 - a significant drop relative to the

previous decade. (28)

**Table No. 2**  
**National Production of SawnBoard**  
**including Squared Off, Planed, Sawn, And Dovetailed**  
**1974- 1983**

<b>Years</b>	<b>Cubic Meters</b>	<b>Annual Percentage Growth</b>
1974	319.331	-
1975	333.285	4.4 %
1976	344.245	3.3 %
1977	351.957	2.2 %
1978	358.969	2.0 %
1979	367.943	2.5 %
1980	377.142	2.5 %
1981	386.570	2.5 %
1982	396.235	2.5 %
1983	402.219	1.5 %
<b>Average</b>	<b>363.790</b>	<b>2.3 %</b>

**Source: CENDES, Diagnostico Actualizado del Sector Maderero,**  
II, p. 305.

## MOUNTAIN SAWMILLS AND URBAN DEPOSTS IN PICHINCHA: THE POPULATION

Accurate assessments of the size of the sawmill population are difficult to obtain. The principal source of information is the Ministry of Agriculture (MAG), the agency responsible for overseeing and regulating the activities of the wood industry, and the National Institute of Statistics and Census (INEC).

The regional forestry staffs of the agriculture ministry do not have the capacity, given their multiple responsibilities, to control the large number of mountain sawmills in a given area, especially the chain saw operators and mobile circular saw mills operating outside of these regulations, i.e. those exploiting timber illegally. This limits the accuracy of their information. The Forestry Department has also not given much priority to developing accurate statistical information about this sector. (29)

The Ministry of Agriculture carried out a census of sawmills in 1973 and a follow-up survey in 1982-83. While the 1973 data is available, the more recent statistics have not been published. As a result, the currently available statistical information is outdated and unfortunately known for its inaccuracy. (30)

Three hundred mountain sawmills were determined to be in operation in 1973, based on the MAG census figures. This number more than tripled in the following decade, according to knowledgeable individuals familiar with the 1983 census carried out by the Ministry of Agriculture. (31)

A recent survey of the wood industry in Ecuador concluded that more than 446 sawmilling and planing establishments were in existence in 1983. The establishments referred to include both mobile and stationary mills, those based in the forest and in urban areas, and those contracted by third parties. These figures do not desegregate between mountain sawmills and urban secondary processing mills. More significantly, this survey limited the population under consideration to 100 percent of the large scale enterprises, to 50 percent of medium-sized firms, and 20 percent of small firms and artisans. (32)

The 1980 census and data gathered informally from the 1982-83 MAG census indicate that the large majority of mountain saw mills and urban deposits are small firms or artisan workshops. Therefore, this survey appears to have substantially underestimated the size of the true population, particularly of mountain sawmills.

## Mountain Sawmills in the Greater Santo Domingo Area

The region surveyed for the study of mountain sawmills is the greater Santo Domingo area, which is located in the province of Pichincha. Over 90 mountain sawmills are known to be in existence in this area, according to the records of the local Forestry Department officials and the Association of Small Sawmills of Santo Domingo.

The mountain sawmill population in the Santo Domingo area is of interest principally because of its strategic location and the large number of stable sawmill operations. Santo Domingo is located at the nexus of principal transportation routes linking up a region of sizeable timber supplies - the Esmeraldas province to the north - with the major areas of lumber consumption - Guayaquil, Quito, Manta.

The Santo Domingo region was an area of large forest reserves on a transportation route for several decades prior to recent deforestation. Therefore, the sawmilling tradition in the region is well established. However, the timber supply in the region has been severely depleted over the years, with little to no reforestation.

The target population of mountain sawmills surveyed in the Santo Domingo area are almost uniformly small, primitive establishments employing an average of ten workers to process

lumber with one or several diesel motor-driven circular saws.

Nearly two-thirds of the mill operators interviewed established their firm less than 10 years ago; almost half of the total set up operations less than five years ago.

**Table No. 3**  
**Sawmilling in the Province of Pichincha:**  
**Mountain Sawmills in the Santo Domingo Area**  
**Year of Establishment**

<b>Sawmills' Year of Establishment</b>	<b>Number of Firms</b>
Less than Five Years ago	6
From Five Years to	
Less than Ten Years ago	3
From Ten Years Ago and	
Older	5
<b>Total</b>	<b>14</b>

**Source:** Survey on Saw Mills, Province of Pichincha, 1985,  
Conducted by Cressida McKean.

**Table Prepared by:** Cressida McKean

The operators of these sawmills had little institutional support in setting up their firm. Banks were minimal source of financial support. Rather, they established these firms principally with their own finances

and/or with funds lent to them by private concerns, such as machinery suppliers, wood-related industries or moneylenders.

Table No. 4

Sawmilling in the Province of Pichincha:  
Mountain Sawmills in the Santo Domingo Area  
Source of Financing for Firm Establishment

Sources of Financing	Average Percentage Use as A Source of Financing
Own Personal Funds	43 %
Bank Financing	18 %
Private Sources of Financing	39 %
Total	100 %

Source: Survey on Saw Mills, Province of Pichincha, 1985,  
Conducted by Cressida McKean.

Table Prepared by: Cressida McKean

These enterprises prepare timber wood into squared off "piezas", construction sawnboard ("tablones" and "tablas"), beams ("vigas"), and in some cases refinish the lumber into construction materials, including floor boards and moldings. The machine, which forms the basis of these firms milling operations, is generally a large circular saw with a blade averaging 5/16 in width driven by a diesel motor.

These sawmills have an average of five machines and US \$24,000 in assets. However, these figures are misleading since the averages are skewed by those firms which have a well-developed stock of carpentry machinery; and those firms which have forestry equipment for timber exploitation, including tractors and platform trucks.

**Table No. 5**  
**Sawmills in the Province of Pichincha:**  
**Mountain Sawmills in the Santo Domingo Area**  
**Machinery - Amount and Costs**

<b>Number of Machines</b>	<b>Number of Firms</b>
Two or Fewer Machines	4
Three to Five Machines	5
Six to Ten Machines	4
Over Ten Machines	1
<b>Total</b>	<b>14</b>
<b>Value of Machines*</b>	
US\$8,000 or Less	4
Over US\$8,000 to US\$24,000	6
Over US\$24,000 to US\$40,000	2
Over US\$40,000	1
Not Available	1
<b>Total</b>	<b>14</b>

\*Value of Machines is calculated at 125 sucres is equal to one dollar

Source: Survey on Saw Mills, Province of Pichincha, 1985, Conducted by Cressida McKean.

Table Prepared by: Cressida McKean

The average sales levels of these primary processors is US \$4,800 monthly at the full production. However, this figure is slightly skewed by one producer, whose sales are US24,000 monthly. Also, the seasonality of production has a serious effect of sustaining production in these mountain sawmills. The majority of the owner-operators interviewed worked less than nine months a year. As a result, these production and sales figures need to be adjusted for this seasonality.

Urban Deposits in Greater Quito

TO BE PROVIDED AT A LATER DATE

MACHINE AND HUMAN MALFUNCTION

## THREAT OF ENTRY

While barriers to entry in the sawmilling business are traditionally low, barriers have escalated for a number of competitors in recent years. For much of the past decade, anyone with a transportable circular saw, or even just several chain saws and rented mules, could easily establish a viable mountain sawmilling operation. Up until five years ago, large amounts of timber located adjacent to transportation routes were available for exploitation.

In the last few years, significant changes in the logistics of timber exploitation; the severe rise in the cost of forestry industry machinery; and government effort to increase their control over the primary processing industry - - these factors have all contributed to significantly discouraging continued entry.

First, the logistics of securing access to timber supplies has been a factor limiting entry. Previously, access to exploitable timber often consisted of using the "banana boy" trails of another era to enter a forested area several hundred meters from a transportation route. The trunks were cut by chain saws into transportable pieces, and then loaded up onto a small truck carrying the timber to the circular saw located nearby.

This era is past. Knowledgeable industry observers and participants consistently remark in interviews on the rapidly growing inaccessibility of timber supplies. Exploitable timber is now more likely located at least several to well over a dozen kilometers from transportation routes. Many times, roads have to be built before the timber can be exploited.

Heavy equipment, specifically a forestry tractor and a truck, has become essential to sustained access to timber. The costs of timber exploitation and transportation are extensive, largely as a result of using this expensive, imported machinery over such a distance. Some operators use chain saws and mules as an alternative, but these are very inefficient operators.

As timber is the principal input in a sawmilling operation, an assured supply of this input becomes critical to sustaining production. Even though owning a forestry tractor is not a prerequisite to establishing a sawmill for primary processing, the cost of the lumber at the sawmill is rising largely as a reflection of the increasing difficulties of exploitation. In other words, the capital requirements of exploiting the timber is creating a barrier to the entrance of new stable sawmilling operations.

This trend may have made entry difficult for those with

sufficient capital to purchase only a large circular saw and several chain saws. These firms have to face severe potential competition from those mills which own forestry tractors, have the capital to rent this equipment or to contract the work from intermediaries. Those mountain sawmills which own one or more forestry tractors and/or platform trucks tend to have larger sales than those without such assets. (33)

A second factor is obviously the rise in the cost of the sawmilling machinery required. The cost of a used large circular saw is still minimal --US\$800 to US\$2,000. However, the cost of a new relatively efficient circular saw is over US\$4 thousand.

The cost of renting a forestry tractor to secure the timber supply ranges from US\$112 to US\$160 per day. Using the machine three days a week for four weeks, the cost reaches US\$1,344 to US\$1,920 a month, which is more than many mountain saw mills make in sales per month. This is not even to consider the price of a new forestry tractor, which costs up to US\$96,000. (34)

Government policy has also raised the barriers to entry in the mountain sawmilling business. The Central Bank, through a disposition, excluded the use of financing for activities relating to the felling of trees and for mountain

saw mills. (35) Concern about escalating deforestation of tropical forests was a primary motivation behind the issuing of this disposition. If credit was cut off to those saw mills for the purchase of timber and milling equipment, it was hoped that the trend toward deforestation would be slowed. (36)

As this disposition refers to financing sources under the Central Bank's control, it denies mountain sawmills access to subsidized credit available to small industry and artisans under the Law for the Promotion of Small Industry and Artisans. This includes Fondos Financieros, a line of subsidized credit for small industry and artisans managed by the Central Bank. (37) As a result, these firms have to obtain all their capital needs from private sources or from their own funds.

The Central Bank disposition does not have FOPINAR, a line of subsidized credit principally for the purchase of machinery serving small industry and artisans, under its purview. Rather this line of credit is managed by the Corporacion Fianciera Nacional (CFN), a state corporation which operates independently of the Central Bank. As a result, mountain sawmills can borrow subsidized loans from the FOPINAR line of credit, even for the purchase of machinery to fell timber. (38)

The banks are not fully informed as to whether the Central Bank disposition applies to the FOPINAR line of credit or not. Therefore, borrowers are often unintentionally cut off from this line of credit. In the Santo Domingo area, the Banco Nacional de Fomento, which administers FOPINAR credit regionally, was not aware that this credit could be used for the purchase of sawmilling machinery. (39)

Overall, banks' restrictive policy towards mountain saw mills has not encouraged entry of new milling enterprises. Significantly, this includes those who might be in a position to modernize the antiquated machinery currently in use. (40)

The government's attempts to control and regulate the primary processing wood industry also serve to discourage entry into the sawmilling business. The Ley Forestal establishes a legal basis to initiate restructuring of the sawmilling industry. It was passed partly out of concern about the lack of modernization of the mountain saw mills, the lack of regulation of the chain saw operators, and the inadequate reforestation in the face of continuing deforestation. (41)

The Ley Forestal currently requires sawmill operators to pay for timber concessions by the cubic meter; to pay a fee for reforestation activities; and to pay for the transport of lumber. While all these regulations may serve a positive

end, it has also helped to discourage entry.

The attitude of the existing sawmill' owner-operators about the future and their investment tendencies are a good indication of the poor "climate" for entry. Only one-fifth of those interviewed were optimistic about the future of the sawmilling business. In addition, given availability of capital, the preference of more than sixty percent of these owner-operators was to not invest in their enterprise, but to invest in another activity altogether or in financial assets.

In recent years, entry by chain saw operators is significant and growing. These artisan operations have increased their presence principally in areas, where milling with a circular saw is difficult or inaccessible by other means. The government attempted in the early 1980's to control these chain saw operators' activities by prohibiting the importation of chain saws. However, the machinery suppliers were able to circumvent the prohibition by importing the chain saws disassembled as spare parts, and then reassembling them once in the country. As a result, the government has rescinded its ban on importing chain saws.

(42)

While these one person operations may lower the profits in the industry and increase competition, their increased entry does not present the potential for a major

restructuring of the industry.

Urban sawmilling deposits are similarly threatened by the entry of artisans. Entry by artisans into the secondary sawmilling industry has doubled since 1980 and is anticipated to continue, in the view of knowledgeable industry observers. For those sawmilling enterprises competing principally on the basis of price, and opting for a low cost strategy, the sustained entry of artisans will further erode their profits and increase competition in this market.

The cost of heavy secondary processing machinery, particularly imported machinery, has increased considerably in price in the last five years. Less supplier credit is available, the credit terms are more difficult to sustain, and sales of new machinery have dropped, according to machinery suppliers interviewed. (43)

This suggests that entry by artisans may slow in the near future, given the rise in costs. Also, industrially-oriented entrepreneurs will have decreasing interest in making sizeable initial investment in the basic heavy machinery because of the very competitive market and the trend toward a shrinking market and declining sales since 1980.

Entry by relatively modern, established secondary

processing deposits is also unlikely. Their strategy is principally that of targeting a quality-oriented upper income buyer, rather than competing with the low cost producers. Their preference has been for a higher profit margin over a larger market share. Entering the low cost market and competing on the basis of price is a high risk proposition.(44)

In the long term, the large scale wood industry represents a significant threat as an entrant in the sawmilling industry. The large plywood and particle board manufacturers have integrated backward principally by engaging logging contractors to ensure a sustained supply of timber. Most of these firms have invested extensively in forestry tractors, and increasingly in the purchase of land and, in some cases, in reforestation. (45)

These industries exploit almost exclusively very high quality soft woods required for plywood production, but a great deal of very useable timber is located in the same areas where the high quality soft wood is found. Therefore, this remaining of millable timber represents an opportunity for the wood industry to enter the sawmilling business.

Moreover, given their presence in the areas of timber exploitation, they can potentially save a great deal in transportation costs, by increasing the amount of processing

closer to the source of supply. In other words, they may expand investment in the secondary processing of lumber, currently handled by the urban deposits, in areas closer to the supply of timber.

Several factors suggest that entry by these large industrial wood manufacturers is unlikely in the near future. First, the crisis in the wood industry brought on by the total loss of major markets in Venezuela and Colombia and by rising production costs cut severely into the profitability of these firms. Many are preoccupied with rebuilding the market for their existing production or investing in financial assets, rather than contemplating new complementary investments. Second, the market for sawnboard is competitive.

Entry into this market will only pay for these large industries, when they are the principal source of raw material supply in the country. In other words, those industries which have made a long term investment in reforestation will have a competitive advantage in sawmilling as well in the years ahead.

**INTENSITY OF RIVALRY AMONG EXISTING COMPETITORS**

Competition among mountain sawmills engaged in the primary processing of timber and small scale urban deposits is severe throughout Ecuador, in the view of knowledgeable industry observers. Intense rivalry may be inevitable given the predominance of artisan sawmilling operations producing a near commodity product.

Competition in the sawmilling industry was perceived to have increased significantly since 1980, in the view of the majority of owner-operators surveyed. However, the situation is perceived as much more acute by the mountain sawmills.

**Table No. 6**

**Sawmilling in the Province of Pichincha:  
Mountain Sawmills in the Santo Domingo Area  
The Intensity of Competition**

<b>Trends</b>	<b>Percentage of Respondents</b>	
	<b>Mountain Mills/Urban Deposits</b>	
A Significant Increase in Competition since 1980	79 %	50 %
No Significant Change in Competition since 1980	14 %	42 %
A Significant Drop in Competition since 1980	7 %	8 %
<b>Total</b>	<b>100 %</b>	<b>100 %</b>

**Source:** Survey on Saw Mills, Province of Pichincha, Conducted by Cressida McKean.

**Table Prepared by:** Cressida McKean

New competitors in the sawmilling appear to be outstripping the number of firms dropping out of the market in the 1980 to 1985 period. To gauge the trends in the size of the competition, owner-operators were asked how many new competitors had emerged and how many had dropped out of the market since 1980.

In the mountain sawmills surveyed, the number of new entrants cited averaged eight firms, while the number of departures averaged six firms. The urban deposit owners cited an even larger real rise in competitors, with new entrants averaging 14 firms while the drop in competitors averaged four firms.

An important factor in this escalating rivalry is the composition of the competitors. Most sawmill owner-operators interviewed stated that their principal competitors are either artisans or small industry. Only one sawmill identified large industry as a primary competitor.

The significant presence of artisans competing in the sawmilling industry is a factor contributing to escalating

competition. For the majority of artisans, there is little incentive to leave the industry. The greater Santo Domingo area is a region of high unemployment and underemployment with the highest population growth in the country. (46) The increasing obstacles to sustaining a mountain sawmill appear to have increased the rate of bankruptcy in the primary processing industry, but the sustained entry of artisans indicates a determination to remain despite the adverse conditions.

**Table No. 7**  
**Sawmills in the Province of Pichincha:**  
**Composition of the Competition**

Primary Competitors	Percentage of Respondents	
	Mountain Mills	Urban Deposits
Artisans	64 %	35 %
Small Firms	29 %	41 %
Large Firms	7 %	24 %
Other	0 %	0 %
<b>Total</b>	<b>100 %</b>	<b>100 %</b>

Source: Survey on Saw Mills, Province of Pichincha, Conducted by Cressida McKean.

Table Prepared by: Cressida McKean

Competition with large industry and small industry is

cited among mountain sawmills for several reasons. One is that several sawmills are large and sufficiently well established to compete over raw material supplies with the large scale wood panel industry. In addition, competition with small firms is an indication of the rivalry with commercial intermediaries, who also supply the urban deposits, and of the diversity within the sawmilling population in the area.

Given their location and the size of the population, the composition of competitors for the urban deposits is inevitably more diverse. As they are preparing a more processed, potentially more differentiated product, these small industrial mills compete on a diversity of criteria. As a result, the potential for competition with small industry and large firms is relatively greater.

As the table below suggests, the primary orientation of most owner-operators of these small sawmills is not growth, but personal independence and higher incomes. For the mountain sawmills, the income factor is a primary consideration, which suggests that there are few incentives for exiting the industry given the alternative. In both cases, this is an indication of relatively high exit barriers for a number of individuals in the industry.

Table No. 8

Sawmilling in the Province of Pichincha  
 Motivation for the Establishment of the Enterprise

Responses	Percentage of Firms	
	Mountain Mills	Urban Deposits
To be independent, not an employee.	43 %	58 %
To earn more than a worker or employee	43 %	17 %
To develop a large enterprise	7 %	8 %
Other	7 %	17 %
Total	100 %	100 %

Source: Survey on Saw Mills, Province of Pichincha, 1985,  
 Conducted by Cressida McKean.

Table Prepared by: Cressida McKean

Another participant in the industry, which is fueling the competition, are commercial intermediaries. In the primary processing industry, these truckers compete with the circular saw mill operations, principally because these intermediaries purchase lumber from the chain saw operators along the roadside. The truckers have the mobility and the cash, two assets which stable sawmilling operations often lack. As these chain saw operators have fewer fixed costs

than the more stationary circular sawmilling operations, they are able to offer a lower price to the intermediaries.

The lack of differentiation of many products in the sawmilling business increases price competition. In both primary and secondary processing mills, the majority of owner-operators interviewed competed on the basis of price.

**Table No. 9**  
**Sawmilling in the Province of Pichincha:**  
**The Basis of Competition**

Basis of Competition	Percentage of Firms	
	Mountain Mills	Urban Deposits
Price	79 %	67 %
Product Quality	21 %	17 %
Location of the Firm	0 %	8 %
Distribution Capacity of the Firm	0 %	8 %
Emphasis in One Group of Buyers	0 %	0 %
Total	100 %	100 %

Source: Survey on Saw Mills, Province of Pichincha, 1985,  
Conducted by Cressida McKean.

Table Prepared by: Cressida McKean

A increasing trend among mountain sawmills is undercutting the price of established competitors, which has tended to bring down the price for all the sellers. This trend is attributable in part to their response to sharply rising production costs, and declining sales. As affordable credit is not available for the purchase of timber, sawmills operators are increasingly constrained in their capacity to sustain production, given a lack of liquidity. At the same time, the financial burden of paying for or leasing heavy forestry equipment, e.g. forestry tractors, or even for the spare parts has placed a further serious constraint on their cash flow.

Half of the mountain sawmill owners surveyed were contracted by other firms to supply them with lumber. These firms customarily received a cash advance to purchase timber and were "sold" a forestry tractor to carry out the primary exploitation. In turn, these firms would "pay" their contractors in lumber. This situation significantly increased the financial vulnerability of many of these firms. Therefore, price cutting to sustain production has become a natural response. (47)

In an effort to restrain sustained price competition, the Nucleus of Small Wood Producers of Santo Domingo established a uniform price list of standard products. However, this attempt at a producers' price cartel has not

been very successful. (48) Operators in the Santo Domingo area continue to undercut their competitors. The association has also initiated a policy of restricting the number of members. This measure is intended to limit the extent of competition. Unfortunately, the large number of firms of roughly the same size only diminishes the potential for any kind of price leadership.

The urban sawmilling deposits face a similar problem with severe price competition. Only 17 percent of the firms' owner-operators surveyed believed that they could expand their market; the rest stated that it was not possible. In fact, the contraction of the current market was the predominant reason given for their use of installed capacity, which averaged 53 percent for these deposits. This situation has encouraged substantial rivalry.

## **BARGAINING POWER OF BUYERS**

### **Mountain Sawmills**

Mountain sawmills have limited leverage over their buyers as a general rule. However, these enterprises have different production capacities and strategies, which in turn is reflected in the nature of their buyers. The table below gives a breakdown of the composition of the buyers for the mountain sawmills surveyed in the Santo Domingo area.

Table No. 10

Sawmills in the Province of Pichincha:  
Mountain Sawmills in the Santo Domingo Area  
Composition of Buyers

Buyers	Percentage of Sales to this Particular Buyer
Individuals	26 %
Commercial Intermediaries	37 %
Small Firms	19 %
Large Firms	18 %
Total	100 %

Source: Survey on Saw Mills, Province of Pichincha, 1985,  
Conducted by Cressida McKean.

Table Prepared by: Cressida McKean

Commercial intermediaries are the predominant buyer of primary processed lumber produced by mountain sawmills, as well as the primary seller to the urban deposits. These buyers have considerable leverage principally because they have control over a lucrative stage in the lumber business - transportation.

The cost of transporting lumber by platform truck (approximately eight tons) from the greater Santo Domingo area to Guayaquil, which is location of the area's principal

buyers, is US\$140 to US\$160. The cost of transport to Quito is similarly high, ranging from US\$70 to US\$110. Intermediaries and others familiar with the industry calculated this cost as approximately forty cents, or fifty sucres, for each kilometer.

As an intermediary can sell a truckload of 180 construction pieces or "piezas" for approximately US\$200 to US\$240 to the deposits, it is probably that the transportation expense accounts for forty to eighty percent of the final price. As chain saw operators sell "piezas" along the highway for 20 to 25 cents per meter, the margin for the intermediary can be even higher. (48)

While these intermediaries are able to gain from the value added as a result of the transportation, they also are able to play one sawmill operation against another. These intermediaries can purchase standard "piezas" and "tablones" just as easily and often cheaper directly from the chain saw operators along the roadside. The intermediaries as buyers can avoid the much higher costs associated with exploitation with a forestry tractor. As a result, these intermediaries have greater power than the excessively fragmented primary processing firms.

Commercial intermediaries also have considerable leverage because they are a primary source of supply of

processed lumber for the deposits and remilling operations in the major urban areas. The market for construction lumber is in the principal urban areas: Guayaquil, Quito, Cuenca, Ambato, and Manta. A survey of construction material deposits in the Greater Quito area found that forty-four percent of their suppliers are commercial intermediaries.

**Table No. 11**

**Sawmilling in the Province of Pichincha  
Suppliers of Processed Lumber to Urban Sawmilling Deposits**

<b>Supplier</b>	<b>Percentage of Firms</b>
Commercial Intermediary	44 %
Producers	31 %
Individuals Contracted by the Enterprise as a Supplier	25 %
Firms Contracting the Enterprise	0 %
<b>Total</b>	<b>100 %</b>

Source: Survey on Saw Mills, Province of Pichincha, 1985,  
Conducted by Cressida McKean.

Table Prepared by: Cressida McKean

Many deposits have fairly standard lumber requirements, in terms of species and dimensions. This situation increases the intermediaries' capacity to choose between suppliers. In addition, the deposits tend to purchase sawnboard from

intermediaries principally on the basis of price, rather than quality. As sawnboard represents a considerable percentage of the operating costs of the deposits, they have a significant interest in securing the most competitive price for this input. This tendency encourages the intermediary to make the best use of whatever leverage he does have with the various milling operations.

Some mountain sawmill owners prefer to use an intermediary principally because of their experience with firms rejecting deliveries at the plant site or because of the labor and logistical problems associated with exploiting the timber directly. (49)

**Table No. 12**  
**Sawmills in the Province of Pichincha:**  
**Mountain Sawmills in the Santo Domingo Area**  
**Transport Capacity and Sales Levels**

Types of Firms	Sales Level	Sales Level
	Under US\$4,000	US\$4,000 Plus
With Transport Capacity*	Two Firms	Five Firms
Without Transport Capacity	Five Firms	One Firm

\* For one firm the sales level was not available.

Source: Survey on Saw Mills, Province of Pichincha, 1985,

Conducted by Cressida McKean.

Table Prepared by: Cressida McKean

As this table indicates, those mountain sawmills which own one, or more than one, forestry tractor and/or large platform trucks tend to have larger sales than those without such assets. In other words, those firms which integrated backward by purchasing forestry exploitation and/or transport equipment had a greater potential for a higher volume of sales than those depending on commercial intermediaries.

The firms selling to individual consumers tend to be those with additional remilling machinery permitting them to refinish primary processed lumber for construction purposes. In the Santo Domingo area, this market is small, localized, and predominantly low income, and the majority of buyers - 79 percent - compete on the basis of price over quality. (50) Attempts to improve the quality of these products to increase the value-added, such as industrial kiln drying, have not been successful, at least when targetted to the local market (51)

In short, individual consumers are not the "best" buyers for mountain sawmills in the Santo Domingo area. All the owner-operators interviewed with a secondary processing capacity and selling predominantly to individuals preferred to invest fresh capital, if it were available, in financial assets or a new business. Uniformly, they rejected the

option of investing in their own enterprise. (52)

The large and small firms which buy from the mountain sawmills range from a variety of construction firms; state agencies, including the Banco de Vivienda and the Public Works Ministry; as well as sizable manufacturing firms requiring lumber as a principal input, (e.g. principally those firms based in Guayaquil, such as Madinsa, Starmet).

The principal advantage in targeting these buyers is that their specialized requirements for a given species, specific dimensions, and/or a sizable volume increases the leverage of the sawmill. The sawmill can then benefit from the value-added which fulfilling these requirements implies. In effect, these firms pay a higher price for such products.

Table No. 13

**Sawmills in the Province of Pichincha:**

**Mountain Sawmills in the Santo Domingo Region**

**Composition of Buyers and Sales Level**

Firms	Sales Level	
	Under US\$4,000/	US\$4,00 Plus
At least half of sales to small and large buyers.	Four Firms	One Firm
Less than half of sales to small and large buyers*	Two Firms	Six Firms

The sales figures were not available for one of the firms.

Source: Survey on Saw Mills, Province of Pichincha, 1985,

Conducted by Cressida McKean.

Table Prepared by: Cressida McKean

An indication of why these buyers are preferable for mountain sawmills can be found in a comparison of the sales level of those firms supplying principally institutional buyers and those supply principally individuals. The average sales level is consistently higher in those mountain sawmills with at least half of their sales going to small and large institutional buyers, as the table indicates.

These institutional buyers still retain considerable influence over the terms of the sale. Construction companies have been known to default on payment, which is not surprising given the well-known cyclical nature of the industry and the recent recessions. In the case of the state agencies, payment is usually assured, but is often delayed. The firms requiring lumber of particular species or measurements are difficult clients to retain, because it is not always possible to fulfill their order. The primitive state of timber exploitation is not a support to those sawmills aiming to serve these buyers.

Mountain sawmills have tended to adopt a passive approach to selling their product to buyers. The large

majority -nearly eighty percent -of mountain sawmill owners interviewed sold their processed lumber solely by responding to requests at the plant site. The other twenty percent, which were firms with relatively large sales' volume, actively searched out buyers. (53)

Mountain sawmills have developed a different approach with another important group of buyers: firms which subcontract sawmills to produce a given product. In the survey in the Santo Domingo area, half of the mills had been subcontracted by other enterprises. The large majority of the firms subcontracting these mountain sawmills are large industries - over seventy percent of the total. In the view of the mill owners interviewed, these buyers subcontract these mills principally to serve as an assured source supply of processed lumber, and, in other cases, to fulfill specific contracts, such as a sizeable construction project.

These contracting firms not only purchase the final product, but also supply the sawmills with specific inputs. In all but one case, these contracting firms supply credit, usually an advance for the purchase and for the exploitation of the timber. Forestry tractors are supplied as an input to half of these mills. In several cases, the contracting firm also supplied technical assistance and/or lumber as well. It is accepted practice for these subcontracted firms to pay off the credit and/or the machinery advanced with delivery, and

often not in cash.

This subcontracting arrangement is not to the liking of the majority of sawmill owners surveyed. This may be in part due to the fact that the contracting firm determines the conditions of payment in more 70 percent of the cases, in the view of owners interviewed. In addition, all the owner-operators who "purchased" a forestry tractor on credit have had very severe problems paying for the tractor with lumber "deliveries." Several have previously had their tractor repossessed by the contracting firm. In fact, several saw mills, which lost their tractor to the contracting firm, became successful subsequently as "independent" operators. They tended to purchase a forestry tractor independent of a subcontracting relationship.

Subcontracting by other firms appears to be the only alternative for the more marginal saw mills with very limited assets. However, the owner-operator of the sawmill with the largest volume of production and sales of those firms surveyed was able to make a subcontracting arrangement profitable. But he was able to determine the conditions of payment with the contracting firm.

### Urban Deposits

The composition of buyers for urban deposits differs from mountain sawmills principally because they offer a

finished construction material based in major urban areas with considerable demand. Their buyers are not commercial intermediaries, rather they are individual endusers, such as homeowners; tradesmen and professionals, including carpenters, contractors, and architects; as well as small and large construction companies.

**Table No. 14**  
**Sawmilling in the Province of Pichincha:**  
**Urban Deposits in Greater Quito**  
**The Composition of Buyers**

Type of Buyer	Percentage of Firms
Individuals	66 %
Commercial Intermediaries	0 %
Small Firms	24 %
Large Firms	10 %
Other	0 %
<b>Total</b>	<b>100 %</b>

**Source:** Survey on Saw Mills, Province of Pichincha, 1985, Conducted by Cressida McKean.

**Table Prepared by:** Cressida McKean

This large representation of individuals and small firms as buyers is a reflection in part of the fragmentation in the construction industry. There are very few large construction

companies in Ecuador. The principal ones are the government-run Junta de la Vivienda, and the Sistema Mutual. These larger enterprises often have direct links with mountain sawmills. Otherwise, much of the construction activity is carried out by individual architects, contractors, carpenters and homeowners. These individuals purchase directly from the urban deposits for the lumber portion of their construction material needs.

It should be mentioned that lumber is often not the major or even a principal input in construction currently in Ecuador. The preference of construction firms is to purchase cement blocks first, then bricks and then lumber. However, lumber is still widely used for floor boards, moldings, beams, among other items. (54)

The sawmilling deposits have leverage over individuals as buyers for several reasons. First, their location and accessibility makes them attractive to urban-based purchasers. Second, lumber does not constitute the largest portion of these purchasers' production costs. Therefore, it is often not cost-effective for these small scale buyers to purchase directly from a distant primary processor as a means to lower production costs. Finally, the large number of these individual buyers and their lack of organization -- in other words, their lack of concentration -- increases the bargaining power of the urban deposits.

Urban deposits are in a considerably less advantageous position relation to the small and especially the large construction companies. These companies are few in number; the volume purchased is sizeable; their knowledge of the lumber industry and the costs of production are well grounded. As a result, despite the fragmentation in the industry, they have some measure of power. The large majority of these companies are able to purchase from these deposits on credit. They are also able to significantly negotiate down the price, as well as delay payments considerably. Individuals, on the other hand, are compelled to pay cash to the deposits.

An important comparative advantage of these urban deposits in selling to both individuals and companies is their capacity to differentiate their product - based on quality, firm location, distribution capacity, or a particular specialization in species or dimensions. The owner-operators of the urban deposits compete relatively more on the basis of quality and other factors, than is the case with the mountain sawmills, as was indicated in the table presented earlier. For example, most owners interviewed selected a given species because it offered a better market. As a result, a number of firms specialized in mahogany beams, floor board of good quality wood (e.g. colorado, canelo, caoba), while still others specialized in pallets of very low

quality lumber.

**Table No. 15**  
**Sawmilling in the Province of Pichincha:**  
**Urban Deposits in Greater Quito**  
**Specialization and Sales Levels**

Type of Approach	Level of Sales	
	Under US\$4,000	US\$4,000 Plus
Specialized Strategy	Four Firms	Four Firms
Low Cost/Non-Specialized Strategy	Four Firms	No Firms

Source: Survey on Saw Mills, Province of Pichincha, 1985,  
Conducted by Cressida McKean.

Table Prepared by: Cressida McKean

Bargaining power relative to buyers is still seriously limited for these urban deposits. A very concentrated number of sawmilling enterprises dominate the high-income, "quality" market, with its higher value-added. Each of these modern small industries, including MAPRESA, DURINI, and ROBALINO, specialize in a particular line of production. These firms have in effect a captive market with the architects and construction firms serving the elite. (55)

The small sawmilling deposit owners interviewed are

competing in a more competitive, less concentrated market, in which price plays a relatively greater factor. As a result, in times of severe decline in the construction industry, such as been the case for the last three years, the leverage of even the more specialized firms serving the middle and lower income tier drops.

## BARGAINING POWER OF SUPPLIERS

The principal inputs for sawmills are timber, machinery and labor. One of the greatest constraints to growth of the mountain sawmill is the logistics of supplying the firm with a steady inflow of raw material. In the last five to ten years, the obstacles to ensuring a supply of timber and exploiting this raw material have dramatically increased the bargaining power of suppliers.

Table No. 16

**Sawmills in the Province of Pichincha:  
The Rise in Production Costs, 1985 Relative to 1980**

Production Inputs	Percentage Citing Greatest Rise	
	Mountain Mills/	Urban Deposits
Machinery Maintenance	29 %	0 %
Transportation	25 %	4 %
Timber	22 %	25 %
Wages/Salaries	10 %	46 %
Electricity/Energy	3 %	17 %
Rent	0 %	0 %
Other*	10 %	8 %
Total	100 %	100 %

\* "Other" respondents include principally those citing an increase in imported inputs overall.

Source: Survey of Sawmills in the Province of Pichincha, 1985  
Conducted by Cressida McKean.

Table Prepared by Cressida McKean.

The table on increases in production costs since 1980 suggest that machinery maintenance and transportation were the expenses rising the most in surveyed mountain sawmills in this five year period. The factor most consistently mentioned in the interviews was the rise in the cost of imported inputs. In fact, nearly all of the "other" line item referred to "imported inputs" and so "machinery maintenance" may be underestimated. Timber also was cited as an input increasing considerably in cost. However, the increase of all three inputs are a reflection of the increasingly complex logistics of providing for a secure supply of timber.

Urban deposits face a different set of constraints on growth given the changes in their costs of production over the past five years. Timber was one of two production costs cited as rising most sharply in this period by owner-operators of urban deposits. As these firms are supplied with lumber principally by intermediaries, the rise in the cost of "timber" reflects in large measure the accompanying rises in machinery maintenance costs, transportation, as well as timber expenses. In other words, the price increase in timber really reflects the increases in the logistical costs

of supplying the timber. Labor costs represented the greatest rise for urban deposits in this period. As wages and salaries represent approximately 30 percent of the production cost for a urban deposit, this rise suggests that deposits have lost declined in bargaining power, even though labor may not have gained in real terms. (56)

#### TIMBER

Suppliers of timber to mountain sawmills in the Santo Domingo area include commercial intermediaries, producers, and individuals which the firm has contracted to serve as a supplier. The table below gives a breakdown of these suppliers.

Table No. 17  
Sawmilling in the Province of Pichincha  
Composition of Suppliers of Timber

Suppliers	Percentage of Firms	
	Mountain Mills/	Urban Deposits
Commercial Intermediaries	26 %	44 %
Producers	35 %	31 %
Individuals Contracted by the Enterprise as Supplier	26 %	25 %
Firms Contracting the Sawmills	0 %	0 %
Other	13 %	0 %
<b>Total</b>	<b>100 %</b>	<b>100 %</b>

**Source:** Survey of Sawmills in the Province of Pichincha, 1985  
Conducted by Cressida McKean.

**Table Prepared by** Cressida McKean.

### **Mountain Sawmills**

As the table suggests, the majority of sawmills - over 60 percent of the total surveyed - prefer to secure their own supply of timber from producers either themselves or through contracted intermediaries, rather than purchase from independent commercial intermediaries. In other words, they prefer to integrate backward assuming the complex problem of exploiting the forest as well as carrying out the primary processing of the timber.

Commercial intermediaries, as suppliers of timber, have significant leverage over mountain sawmills as purchasers. Those mills lacking the financial capacity to rent a forestry tractor or purchase one on credit are dependent on these intermediaries.

Several firms, particularly those with secondary processing capacity, prefer to use the intermediaries as suppliers, and to pay more, rather than assume the difficult task of timber exploitation. Exploiting the timber directly requires labor supplemental to the sawmilling operation. Therefore, in some cases, the addition of these workers can

result in the formation of an enterprise committee, which in Ecuador is the precursor to the formation of a union. Often, this is not an acceptable alternative.

The suppliers of timber for those purchasing directly from the producer tend to be largely "colonos" or rural peasants squatting on government land. In most cases, they sell their timber at relatively low prices. In the greater Santo Domingo area, a hectare of forested land sells for seven to ten thousand sucres, at the February 1986 rate of exchange this amounts to US\$40 to US\$80. Considering that one hectare of land can yield from 400 to 800 "tablas" selling for US\$192 to US \$384. In other words, timber is cheap, especially since it represents from 10 to 20 percent of the sale price. (57)

Peasants squatting on government land have been encouraged to sell off their timber in recent years. They can become owners of the property if they prepare the land for agricultural production - a right endowed to them as a result of the Law of Agrarian Reform and Colonization.(58) As a result, the "colono" sells off the timber to cultivate the land, and in turn have the right of ownership. These "colonos," who are largely poor and uneducated, tend to have very little knowledge of finance, marketing, or lumber pricing, which places them at a considerable disadvantage relative to buyers be they sawmill operators or their

contracted intermediaries, or independent truckers.

This approach is relatively labor intensive for the firm, if the manager has to leave the sawmilling operation untended for days at a time to supply the firm with timber. However, the cost associated with the use of a forestry tractor, rented or not, is so considerable, that managers are often unwilling to leave this process to a contract employee.

The sacrifice involved in carrying out lumber exploitation is severe. The group is often isolated for days in the virgin forest without water, electricity, housing, or any services. Therefore, mill owners also use contracted intermediaries as suppliers. The intermediary is given an advance to purchase the timber, to pay for gasoline for the chain saw operators, and for the rental of a truck. The intermediary tends to be one or several local individuals managing a group of chain saw operators and loaders, and in some cases, a driver for the forestry tractor.

The mountain mill owners have substantial bargaining power over these contracted intermediaries, principally because these individuals are usually peasants of the region with chain saw experience. The unemployment and underemployment of the region has increased the supply of these individuals. For example, at a historic statue in the

center of Santo Domingo, several hundred of chain saw operators wait at four to five in the morning to be contracted for timber exploitation work. (59)

The logistics of the supply of timber, and how the sawmill copes with securing this supply, is the critical factor. As the table below indicates, the sawmill owners interviewed identified logistical factors as those most influencing the price of timber.

**Table No. 18**

**Sawmilling in the Province of Pichincha:  
Mountain Sawmilling in the Santo Domingo Area  
Factors with the Greatest Influence Over the Price of Timber**

<b>Factors</b>	<b>Percentage of Firms</b>
Scarcity of Timber(e.g.distance)	15 %
Seasonal Change	23 %
Excess Intermediaries	15 %
Demand of Large Enterprises	19 %
Transportation Costs	27 %
<b>Total</b>	<b>100 %</b>

Source: Survey by Cressida McKean, Sawmills of Pichincha, 1985

Table Prepared by Cressida McKean.

The power of the independent intermediaries is evident in the citing of "transportation costs" as the most critical factor, especially if one also includes the "excess number of intermediaries." The seasonal variability factor points out the logistical problems of exploiting timber in winter, and how intermediaries can use it to their advantage. It suggests how this factor can be used by intermediaries to escalate the prices in winter for buyers when exploitation is almost impossible. They are also able to lower the price timber in summer, given the excess supply, which allows them to buy up timber from producers in massive quantities.

The "demand of large enterprises" refers to how the requirements of the plywood and other wood panel manufacturers can be the price leader. In the Santo Domingo area, the tremendous requirements of these firms has resulted in the massive deforestation of areas of exploitation. Since timber is more scarce in that area, the price has risen. In areas of significant timber reserves, for example, in Esmeraldas, these large industrial firms act as price leaders in establishing the price level for timber. Therefore, sawmills often have to pay a higher price for ordinary timber, since the price paid by the plywood manufacturer for high quality timber is used as a point of reference.

### **Urban Deposits**

As the previous table indicated, commercial

intermediaries are the principal lumber suppliers for the urban deposits. The distance from the sources of supply and the substantial logistical problems of timber exploitation increases the inherent leverage of the intermediaries in the current situation. The manager of these urban deposits can often not afford to leave the firm untended for extended periods, usually for four days to a week, to replenish his lumber supply. The operation is too small, with an average of six workers, to leave the management to someone else.

These intermediaries are able in most all cases to require payment on a cash only basis. They also are indirectly extended credit, through a system of advances to intermediaries for the purchase of timber. Even though several owners of these sawmilling deposits are former intermediaries themselves or operators of mountain sawmills, their knowledge of the industry does not really help that much in negotiating with these intermediaries.

A number of deposit owners have sought to increase their leverage over these brokers by purchasing timber directly in areas of exploitation, or more commonly by establishing a contractual relationship with individuals to serve as steady suppliers. The purpose of this arrangement is to assist the deposit in obtaining timber of particular dimensions, or special species, to build on their specialization.

This system appears to have yielded results. Those firms which relied exclusively on commercial intermediaries - one-third of deposits interviewed - had significantly lower sales than the average for the total. The average sales level of those dependent on the truckers was US\$900 monthly, which is half the average for all the deposits studied, US\$2,000 monthly.

In conclusion, the principal obstacle for mountain sawmills and urban deposits becomes arranging a suitable mechanism for ensuring a raw material supply. This includes negotiating with suppliers of forestry and transport machinery, and with the labor force required to carry out the exploitation. If transportation costs, problems of distance, seasonal change, and excess numbers of intermediaries have a significant influence over the price of timber, it appears that strengthening the firm's logistical capacity to ensure a continuous supply would be a priority.

#### **MACHINERY**

Stable mountain sawmills require a diesel-operated large circular saw, as well as several chain saws and ideally a small truck, as basic working tools. In addition, a forest tractor and platform trucks may be required depending on the financial capacity and strategy of the firm.

The large majority of this equipment is of imported

origin. Interviews with sawmill operators indicated that 86 percent of the firms used predominantly imported machinery. Several national foundries manufacture the large circular saws with the advance and withdrawal system of carriage, but these machines are of a much lesser quality than imported circular saws. (60) Also, some trucks are assembled in Ecuador by foreign manufacturers. Nonetheless, the chain saws, the heavy forestry machinery and the superior circular saws are all imported principally by a small number of machinery suppliers.

A second-hand market for sawmilling machinery is relatively well established. In the Santo Domingo area, most of the owner-operators interviewed - sixty-four percent of the total - purchased the bulk of their machinery used, while the other 36 percent bought their equipment new. The reasons for this sizable second-hand market is in part the high cost of the imported sawmilling and heavy forestry equipment.

A standard imported large circular saw costs approximately one million sucres or US\$ 8,000. A truck costs about 500 thousand sucres, equivalent to US\$ 4,000. A new forestry tractor costs anywhere from ten to twelve million sucres, equivalent from US\$ 80,000 to 96,000. based on figures supplied by forestry equipment importers and plywood manufacturers. The cost of a used skidder is five million sucres, or US\$ 4,000 at the least. (61)

Given these prices, it is not surprising that there is a market for second-hand equipment. The practice of purchasing a forestry tractor from a large industrial firm in exchange for lumber delivery has resulted in repossession of this equipment in a number of cases. Also, the financial costs of meeting the payments on this expensive machinery, and covering the maintenance and repair costs have proved too burdensome for some purchasers. As a result, more second hand forestry equipment is available. (62)

Serious problems with payment recovery for tractors purchased in the last five years has also changed the sales policy of the major and the sole supplier of forestry machinery. Approximately 80 percent of the loans extended by this major supplier to purchasers of forestry tractors in the past three years are unrecoverable. The severe recession has undoubtedly been a factor. As a result, supplier credit is almost totally cut off, and currently sales are on a cash only basis, which restricts them to large industrial firms.

The average annual sales of forestry tractors in the 1970 to 1980 period was approximately fifteen tractors. Since 1981, sales have dropped to two to four tractors annually. (63) There has also been a significant drop in demand for spare parts. It is significant to note that the repair business for forestry equipment has grown

considerably. (64)

Obviously, a factor in the drop in sales has been the rising costs. The cost of spare parts rose 43,21 percent between December 1980 and December 1983. The price escalation was even greater for the period, January 1984 through December 1985, when these costs rose 92,5 percent. (65)

For the supplier of forestry machinery, these costs reflect an annual seven percent rise given the average increase in U.S. inflation. They also reflect the effect of devaluation; internal inflation; the financial costs of securing a line of credit; the resultant need for an increase of stocks; and the indirect effect of import and foreign exchange restrictions. An oil filter has passed from the most liberal to the most restrictive tariff category in just a few years. (66)

For the individual owner, these rises can represent a considerable expense. For example, one small spare part nearly doubled in price in a two year period, increasing from 1,800 to 3,200 sucres. (67)

For the owners of large circular saws, the principal obstacle is the skyrocketing rise in the price of imported spare parts, principally the teeth for the saw which have to

be regularly replaced. While the price rises have been less dramatic, the cost of trucks assembled locally by foreign manufacturers also reflect inflation; devaluation; financial costs associated with obtaining lines of credit; import and foreign exchange restrictions.

The majority of mountain sawmill owners are not in a position to purchase new additional machinery. Of those interviewed, only 21 percent had an interest in buying more machinery. The principal problem in purchasing more equipment was the restrictive banking policy with regard to mountain sawmills, followed closely by the high prices of the machinery itself.

The bank's policy towards the mountain sawmilling industry is the most serious problem concerning credit for nearly half --48 percent-- of those mountain sawmill operators interviewed. All of the firm owner-operators interviewed found the credit conditions significantly more harsh in 1985, compared with 1980.

The owner of the stable mountain sawmilling operation has little leverage with the suppliers of machinery, while the owner of the urban deposit has somewhat greater leverage. The sawmilling industry is fragmented, while the suppliers are highly concentrated. The sawmilling industry is a marginal buyer of forestry equipment, compared with the

dozens and dozens purchased by the large scale industrial wood industry. Also, the lack of supplier and bank credit for the purchase of saws is another indication of the minimal leverage of the mountain sawmill. .

Table No. 19

**Sawmills in the Province of Pichincha:  
Mountain Sawmills in the Santo Domingo Area  
Major Problems in Purchasing Additional Machinery**

Problems	Percentage of Firms	
	Mountain Mills/	Urban Deposits
Lack of Information	0 %	0 %
High Prices	31 %	42 %
Inadequate Credit Terms	0 %	42 %
Bank Policy Towards Sawmills	38 %	0 %
Other	31 %	12 %
Total	100 %	100 %

Source: Survey by Cressida McKean, Sawmills of Pichincha, 1985

Table Prepared by Cressida McKean.

Urban deposits have greater leverage in purchasing additional machinery. Half of the deposits surveyed expressed an interest in expanding or modernizing their equipment. But the obstacles to purchasing machinery are

much fewer than is the case with mountain sawmills. The principal problems for them are the high price and the interest rates currently being charged by the banks. Moreover, as they have been in operation for extended periods, most already have their full complement of wood-working equipment, even though it may not be modernized.

The current situation places much of the bargaining power in the hand of those supplying second-hand imported machinery, new spare parts, and repair work for forestry equipment and wood-working machinery, which are the products most in demand at the current time. The principal forestry machinery supplier, based in Quito, dominates the market for spare parts and repair work. Sawmill owners, intermediaries, and large industrial manufacturers, among others, control the leasing and second hand market for forestry tractors. Given their limited availability and the heavy demand, the rental market for forestry tractors is expanding. Sawmill owners are known to lease their tractor as a means of expanding their income. (68)

The owner-operators of sawmills manage the used market for the large circular saws, as well as for secondary processing machinery. However, demand for this equipment is not growing, given the slump in the industry. For example, in Santo Domingo, the concern for competition has led to restrictions on the resale of a circular saw to a competitor

who is not already a member of the Association of Small Wood Manufacturers. (69)

## LABOR

### Mountain Sawmills

The basic labor requirements of the sawmill owner-operator are a trained operator of a large circular saw and two others: one to supply the saw with timber and the other to retrieve the lumber once it is sawn. This production process and the number of mills in operation are the critical factors in determining the amount of labor required. However, these requirements change if the mill operator has secondary processing equipment, as well, or if the mill carries out its timber exploitation. Both of these require additional workers: some skilled in secondary processing of timber for construction purposes and in the other case, one skilled in operating a forestry tractor, another in operating a platform truck, two to three to carry out the loading, and another two to three for the chain saw operations.

Several factors indicate that mountain sawmill owners have considerable leverage over the labor supply. There is a large surplus labor pool given a population growth of 120 percent in a five year period, sustained underemployment, and workers with hands-on experience in chain saw operation.

(70) The workers in the industry are also not organized; only one firm out of the sample had established an enterprise

committee, the precursor to a union.

A major problem for both mountain sawmill owners and labor is the seasonal nature of the sawmilling business. Unless the manager of the mountain sawmill specifically plans for the months in winter when timber is scarce and expensive, it is likely that the firm will shut down for several months due to a lack of raw material. As a result, the owner of the firm is not able to retain his work force. The large majority - sixty-four percent - of the owners interviewed kept their workers for periods of less than one year, as the table indicates.

Table No. 20

**Sawmilling in the Province of Pichincha:  
Mountain Sawmills in the Santo Domingo Area  
Average Period of Service of the Work Force**

<b>Periods of Service</b>	<b>Percentage of Firms</b>
Less Than One Year	64 %
One Year	0 %
Two to Four Years	36 %
Five Years or More	0 %
Total	100 %

Source: Survey by Cressida McKean, Sawmills of Pichincha, 1985

Table Prepared by Cressida McKean.

As workers are paid principally on a piecework basis in 86 percent of the cases, it is less difficult to let these workers go than would be the case if they were salaried with insurance. The problem is retaining a skilled committed labor force over the long term. For some firms, this is not a problem as the large majority of their workers are family members, who do not receive a steady wage in any case. Other firms have responded by making a constant supply of timber throughout the year a priority, even when selling the timber might represent a gain in the short term. Nonetheless, this manager retains an experienced, loyal work force.

In effect, the seasonal nature of the business undermines the inherent leverage of the employer relative to the work force. The sawmill owner has to provide some minimal job security to the workers to retain their services over the long term.

Another factor which limits the bargaining power of the sawmill owner-operators is the consciousness of the work force of legislation regarding the right to organize. Labor legislation and fear of unionization was a reason cited by 36 percent of the owner-operators interviewed for retaining their existing labor force, as the table below indicates. More significant in determining the size of the

labor force in the majority of cases was their labor requirements given the level of sales.

The threat of worker organization principally affects the sawmills which have expanded their work force either by increasing the volume of production, by integrating backward into timber exploitation, or by integrating forward into the secondary processing of lumber. The owner-operators interviewed, which have attempted these strategies, stated a preference for either establishing another complementary firm or getting out of the business altogether.

**Table No. 21**

**Sawmills in the Province of Pichincha  
Mountain Sawmills in the Santo Domingo Area  
Reasons for the Size of the Work Force**

<b>Reasons</b>	<b>Percentage of Firms</b>
Labor Legislation and fear of unionization	36 %
Requirements for Labor, in view of sales level	64 %
Cost of workers, given minimum wage legislation	0
Lack of Trained Personnel	0
<b>Total</b>	<b>100 %</b>

Source: Survey by Cressida McKean, Sawmills of Pichincha,  
1985

Table Prepared by Cressida McKean.

Labor's leverage is considerable in larger scale sawmilling enterprises. The low overhead of the existing sawmills, e.g. insurance is paid to very few workers and wages are paid on a piecework basis, suggests that it may be difficult for sawmill operators to expand without dividing up their firm or coming up with some other alternative.

The almost total lack of formal training of the workers in these sawmills indicates that this is not a source of bargaining power. A minority of the workers in the sawmills -- 26 percent -- are semi-skilled or skilled workers. However, only one firm's workers of the whole sample received formal training. Over half of those skilled received training on the job, while more than a third received training as a result of previous employment.

The workers with considerable leverage with sawmill owners are principally those skilled in the operation of forestry machinery, and to a lesser extent, those skilled in the secondary processing of lumber. Those experienced in lumber exploitation receive a premium wage relative to the rest. Also, as high volume sawmill operations expand into secondary processing for construction purposes in the future,

the trained workers will be in a better bargaining position.

### Urban Deposits

Labor places a much more serious constraint on the operation of urban deposits than is the case with the mountain sawmill. While the average number of workers is fewer - six in 1985 compared to ten in the mountain sawmill - the financial burden and the political risk is significantly higher.

First, urban deposits registered as "small industries" are legally obliged to pay a small industry minimum wage with full benefits and insurance to their workers. Two-thirds of the urban deposit owners interviewed are affiliated to the Chamber of Small Industry of Pichincha. Though it was not possible to verify in all cases, the majority - 75 percent - paid the small industry minimum wage with insurance. However, the same percentage of owners also employed occasional workers as standard practice; these workers are not paid the full minimum wage with benefits.

The 1982 government-mandated minimum wage hike and the general recession severely affected owners' determinations about the size of their work force. In the firms surveyed, the consistent trend since 1980 was a decline in the size of the permanent work force. The average number of employees dropped from nine in 1980 to seven in 1983 to six in 1985.

All owners interviewed either reduced or kept the size of their work force constant in both the 1980-83 and the 1983-85 periods. Not one firm increased the number of workers.

The table below gives an indication of the principal reasons for limiting the size of the work force.

**Table No. 22**  
**Sawmilling in the Province of Pichincha:**  
**Urban Deposits in Greater Quito**  
**Reasons for the Size of the Work Force**

Reasons	Percentage of Firms
Labor Legislation and	
Fear of Unionization	28 %
Requirements for Labor,	
in view of Sales Level	44 %
Cost of Workers, given	
Minimum Wage	22 %
Lack of Trained Personnel	6 %
Other	0 %
<b>Total</b>	<b>100 %</b>

Source: Survey by Cressida McKean, Sawmills of Pichincha, 1985

Table Prepared by Cressida McKean.

Half of the firms surveyed did have higher sales levels in 1980 than in 1985. Therefore, it is not surprising that there has been a contraction in the size of the work force. However, owner-operators were also concerned about unionization and the wage cost of labor in deciding how many workers to employ. The threat of unionization did not bring about an increase in the level of worker organization; in fact, not one firm surveyed had ever had an enterprise committee. Rather the response of the owners to this threat was to limit the number of workers to reduce the risk. Similarly, the minimum wage did increase, but the owners' response was to rely on occasional workers, and limit the size of the permanent employees.

In sum, labor has increased their leverage, but the effect has been to reduce their real bargaining power.

**STRATEGY FOR UPGRADING OF SAWMILLING ENTERPRISES  
AND DEVELOPMENT ASSISTANCE REQUIREMENTS**

Several studies on the wood industry and numerous observers interviewed consider mountain sawmills to be a homogeneous group of primitive, isolated, marginal primary processing operations. (70) While this characterization is accurate to certain extent, this kind of generalization ignores mountain sawmills as an integral part of the sawnwood industry, and, in turn, ignores the potential for industrial restructuring incorporating those primary processing enterprises with the greatest capacity to contribute.

A central preoccupation of these studies and observers is to to increase the efficiency of the sawmilling operations through the introduction of band saws. The large circular saw is highly inefficient relative to the band saw, both in terms of the wastage in saw dust and the volume processed.

As the circular saw's teeth are 5/16 of an inch in width, compared to band saw's teeth are 1/8 of an inch wide, the loss of timber is greater with a circular saw than with a band saw. A circular saw is estimated to use approximately 35 percent of the timber. With a band saw, this utilization can be increased by 17 percent according to knowledgeable calculations. In other words, a sawmill can produce one additional "tabla" per trunk with a band saw, as opposed to a

circular saw. (71)

It is a misguided strategy is to direct attention principally toward the establishment of new, modern sawmilling operations, while established sawmilling enterprises are further and further regulated, and increasingly denied the capacity to modernize. My argument is that a strategy to improve sawmilling efficiency has to build on the existing and future capacity of the established mountain sawmills. The sawmills referred to are those which have had the vision to integrate backward for a secure, sizeable timber supply, and/or to integrate forward to strengthen links with industrial buyers.

The tragic experience of those bankrupt sawmills, which blindly introduced the band saw, should be a warning. It should give notice to those attempting to improve sawmilling efficiency without considering the strategic location factors of such undertakings, as well as the installed capacity required for a secure raw material supply and a significant market.

Similarly, the government's efforts to legislate a restructuring of the sawmilling industry have to date led only to further regulation of the industry, and not to the desired modernization. The effect of the ban on credit to mountain sawmills and those engaged in the exploiting timber

has been to substantially increase the production costs for the more stable, established primary processors of timber. At the same time, it has denied them any financial support to upgrade their sawmilling equipment.

The other principal government initiative, the Ley Forestal sets the basis for the establishment of a "minimum technological level" for mountain sawmills. Through this measure, (Articles 186, 187, 188), the government can prohibit the usage of obsolete and inappropriate machinery, equipment, and implements. (72) In effect, as a recent Forestry Department discussion paper on the subject states, "this is the legal basis to be able to begin with the necessary restructuring of the sawmilling industry, with the objective of increasing the profitability of the same and improving the utilization of forestry resources." (73)

This initiative, which dates back to the mid-1970's, is however stalled due to bureaucratic lethargy and the need for inter-ministerial coordination. The Ley Forestal states that the Ministry of Agriculture and the Ministry of Industry and Commerce have to jointly determine this "minimum technological level." This level has yet to be agreed upon.

An important outcome of determining this "minimum technological level" will be the requirement for primary processing sawmills to have an operating permit, issued by

the Forestry Division, based on an established criteria. Criteria suggested in the Forestry Division discussion paper include the state of the principal saw, the existence of secondary processing machinery, the amount of wastage, stages for upgrading machinery, among others. Subsequently, chain saws would be prohibited for the production of board wood. Though it is acknowledged to be a long process, the ultimate objective is the introduction of the horizontal band saw which is considered the most appropriate for Ecuador.(74)

The objectives of this legislation and the current follow-through by the technical staff of the Forestry Division is positive. However, it presupposes a significant increase in the regulatory capacity of the Ministry of Agriculture, and specifically the Forestry Division. An important problem is whether this government regulation will actually stimulate increased efficiency of primary producers. Can the Ministry of Agriculture's Forestry Division manage the progressive elimination of chain saw operators in the industry as suppliers of processed lumber?

Also, will cooperation from the Monetary Board be forthcoming in revising the Central Bank's disposition prohibiting the extension of credit to mountain sawmills? Credit will be a fundamental problem.

My belief is what this discussion of restructuring the

sawmilling industry lacks is a better understanding of the type of sawmilling enterprises which would have the greatest potential to contribute to the upgrading of the industry. In other words, what are the critical characteristics of such firms and what are the best approaches to supporting their continued development.

### **Strategic Segments of the Sawmilling Industry**

The first step is identifying the characteristics of those mountain sawmills with the greatest demonstrated capacity. The previous discussion of how sawmills have responded to the competitive forces in the industry provides some basis for identifying strategic attributes.

The most critical factor in the current environment is the logistical ability to sustain a secure supply of timber. The ownership of forestry tractors and platform trucks are vital for those engaged principally in primary processing.

A complementary requirement is linkage with sources of renewable forests. Involvement in land ownership and reforestation is not possible for the small sawmilling operation. However, some contractual relationship with those large scale plywood and wood panel industries with the vision to reforest for the long term will increasingly be required. The end result term may be more horizontal integration into

sawmilling by large wood industries which have invested in land and reforestation.

Another fundamental requirement is the weight-saving processing of timber by sawmilling operations. In other words, the introduction of secondary processing at strategic areas closer to the areas of processing would reduce the weight of the lumber transported to the major urban areas. The lumber transported would have an increased level of value added. Several mountain sawmills in the greater Santo Domingo area, which were engaged in high volume primary processing, expressed interest or were contemplating investing in secondary processing.

A third attribute is institutional linkage with industry and specialization. A number of mountain sawmills have the volume and capacity to specialize. Several produce a wide variety of squared-off "piezas", four by four meters etc., other produce long wood of up to eight meters, lumber one and a quarter inches wide to supply a broom factory. As the supply of timber becomes even less accessible, industries will need to formalize relationships with established mountain sawmills.

#### **Development Assistance Interests of Sawmill Owners**

The owner-operators of mountain sawmills and urban

deposits had similar interests in technical assistance. In both cases, technical assistance in production processes and credit for working capital and fixed assets were the most in demand. The table below gives a breakdown of their expressed interest.

**Table No. 22**

**Sawmilling in the Province of Pichincha:  
Interests of Owner-Operators in Development Assistance**

Types of Assistance	Percentage of Firms	
	Mountain Mills	Urban Deposits
Use/Select Raw Materials	0 %	4 %
Production Processes	22 %	17 %
Management	7 %	13 %
Credit for Fixed Assets	15 %	21 %
Credit for Working Capital	22 %	33 %
Marketing	0 %	4 %
Quality Control	7 %	4 %
Other	7 %	4 %
None	19 %	0 %
<b>Total</b>	<b>100 %</b>	<b>100 %</b>

Source: Survey of Sawmills, Province of Pichincha, 1985,  
Conducted by Cressida McKean.

Table Prepared by Cressida McKean.

The most appropriate strategy would not be to target the entire small sawmilling population, but to concentrate resources on the established mountain sawmills with the attributes identified above. They have the capacity to absorb an expansion of their volume, to modernize their industry, and can increase the efficiency of the sawnwood industry.

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**EDIFICACION PROYECTADA  
QUITO, GUAYAQUIL Y CUENCA**  
metros cuadrados de construcción

