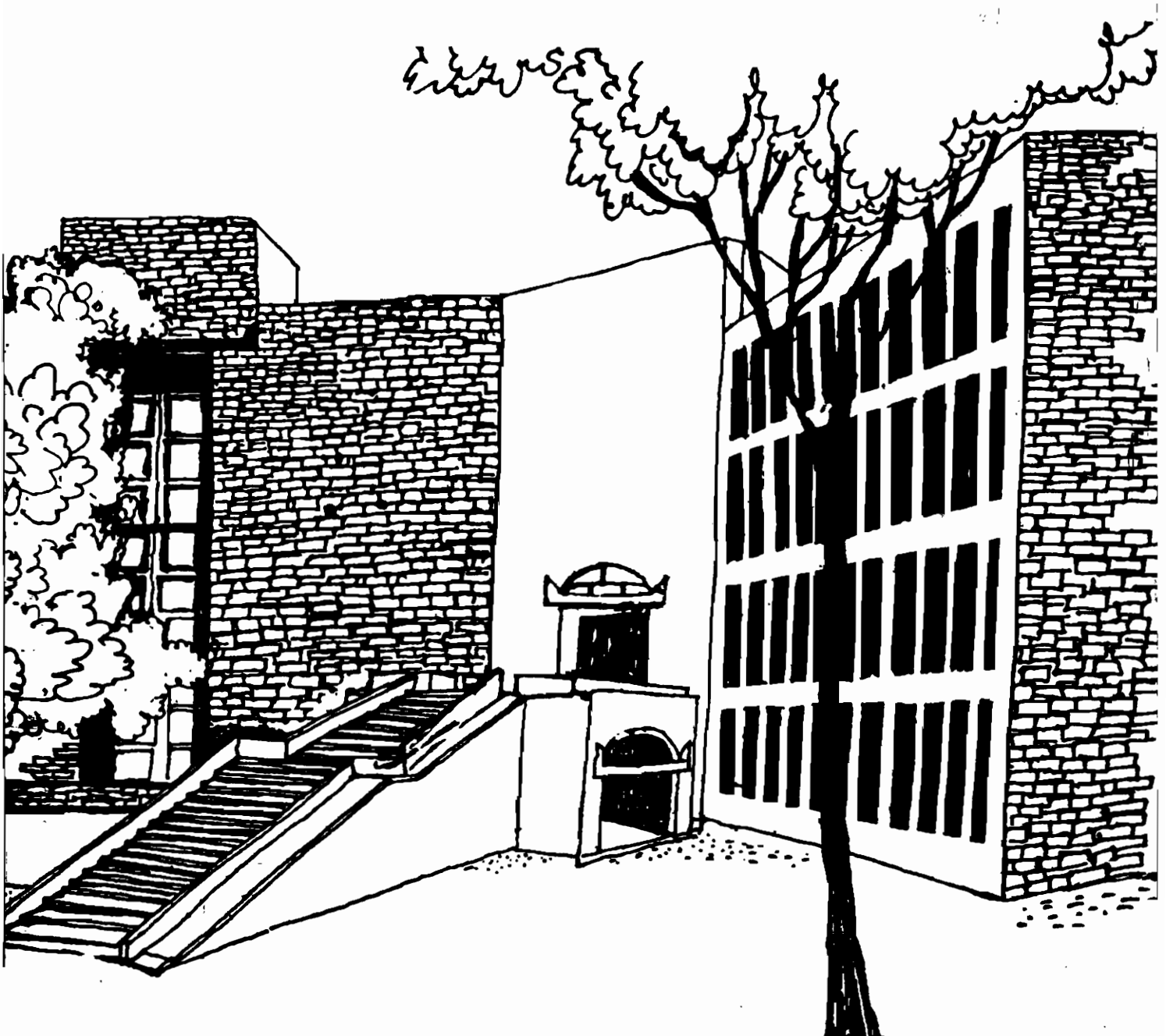




# Working Paper



**A Decision-Oriented Market  
Information System for Forest and  
Agro-Forest Products in India**

**Vasant P. Gandhi**

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# A Decision-Oriented Market Information System for Forest and Agro-Forest Products in India

Vasant P. Gandhi<sup>1</sup>

## Abstract

*There has been a sharp rise in the demand and prices of forest and agro-forest products in India. Yet many agencies report large unsold stocks of different products. Large processors are unable to get sufficient quantities of raw materials, but forest product producers and gatherers often cannot sell what they have produced. This is indicative of a frequent mis-match between supply and demand of different forest products, and is believed to be substantially due to lack of good market information with both suppliers and buyers for correct decision-making. This study, based on primary survey data, first identifies the decision-making needs of different players in the market for forest products. It then develops, based on the study and a conceptual framework, a decision-oriented market information system for a selected set of forest products. The information system to be enabled by computers and internet will source market information locally as well as nationally and internationally. It will process and analyze it, and disseminate it widely to private and public agents including gatherers, growers, processors, traders, buyers, and government decision-makers. If implemented well, it will lead to better information with the agents and good decision-making, which will help to reduce, locally and nationally, the mis-match between supply and demand.*

## Introduction

The activity of forestry is very important in India, particularly so in the central state of Madhya Pradesh (MP) which has the largest forest area (MPFD 1995). Management of forests has assumed tremendous importance in India for the conservation of the environment and for sustainable development (Chaturvedi 1994). The State Forest Departments have so far been playing mainly a policing role. However, in the new future strategy they will also need to be good in facilitating marketing, as well as in extension, to better match supply and demand, and to encourage private agro-forestry to reduce pressure on natural forest lands. This will require technology extension as well as, particularly, collection and dissemination of critical market information related to forest and agro-forest products. The study addresses this issue.

In recent years, there has been a huge increase in the demand for forest products in India. Whereas wholesale price index (Base: 1981=100) rose to 229 for all-commodities, it rose to 366 for wood and wood products, 388 for timber planks, and 479 for Lac by 1993. Despite demand increase many agencies report large unsold stocks of different forest products. But large processors such as paper mills are unable to get sufficient quantities of raw materials such as bamboo and eucalyptus, whereas forest product gatherers often cannot sell what they have gathered (Prasad and Bhatnagar 1991). This is indicative of a frequent mis-match

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<sup>1</sup> Professor, Centre for Management in Agriculture, Indian Institute of Management, Ahmedabad, India, [gandhi@iimahd.ernet.in](mailto:gandhi@iimahd.ernet.in)

between supply and demand of forest products. One major cause is the lack of good market information with both suppliers and buyers.

## Theory

The modern theory and approach for the design and development of good marketing information systems draws heavily from the approach for the designing of good management information systems. There was an old approach (Figure 1) in which the base was simply the existing operations, and the information they generated. In this, the information was a by-product transmitted routinely, and the benefits were produced mainly by chance. By contrast, in the new approach (Figure 1), the starting-point is the key tasks and decisions in the organization, based on its objectives and strategy. Squarely based on the needs of improving these, a tailor-made information system is developed, which will help directly in more effective decisions in the organization. Information in such a system may fit into an information pyramid such as in Figure 2.

The revolution in marketing information is creating enormous stress in traditional organizations. As information volume grows exponentially, and as its useful life shortens, organizations are **being challenged to learn faster**. This means absorbing more information, making sense of it **quickly**, and sharing new insights so members can act well and in time. Information should be acquired, given meaning through interpretation, and then either acted upon immediately or properly stored in memory for later use (see Figure 3). The process is initiated by the acquisition of information through tracking, scanning, experimentation, and market inquiries. The extent of learning depends on how well the information is pieced together and how widely it is distributed so that it can be used. Before the information can be acted upon, it has to be interpreted to reveal meaningful patterns and relationships, so as to be able to facilitate decision-making.

## Structure of the Forest Department

The information system must be related to the organization structure. In this context, the organization of the Madhya Pradesh Forest Department is briefly given as follows:

	<u>No.</u>
* Principal Chief Conservator of Forests (PCCF)	3
* Addl. Principal Chief Conservator of Forests (APCCF)	6
* Chief Conservator of Forests (CCF)	14
* Conservator of Forests (Field) (CF)	22
* Conservator of Forests (Others) (CF)	41
* Deputy Conservator of Forests or District Forest Officer (DFO)	225
* Assistant Conservator of Forests	454
* Range Officer	1674
* Deputy Range Officer	1765
* Forester	5703
* Forest Guard	20141

## The Market Survey

Given the complexity and the lack of knowledge of the nature and operation of the marketing of forest and agro-forest products, a market survey was planned to develop first a good current understanding of the system. The survey covered a selected set of forest products and sought to trace their marketing from the producer level to the final retail. The survey also probed the nature of operations at each level, the decisions being made at each level and the information needs for this decision-making. The survey also assessed the sources of good information and the ease of availability so as to help in the development of a mechanism/ system for information gathering.

The selected set of forest products were: Teak, Sal, Khamar, Eucalyptus, Bamboo, Mahul Patta (*Bauhinia vahlii*), Lac (*Shellac*) and Safed Musli (*Chlorophytum tuberosum*). They span a wide range of important forest products. The survey was based on two major forest districts in Madhya Pradesh and covered the market links nationally. Eucalyptus, Khamar and Bamboo are very important in agro-forestry. The marketing systems identified through the survey are not described for want of space but those for Teak, Eucalyptus and Lac are shown in Figures 4, 5 and 6.

### Market Information and Decision-Making

Information must be useful for decision-making and therefore it was very important to identify which major decisions were being made. Table 1 outlines the different decisions being made and their importance in the markets for the forest products covered in the study. The Table indicates that the decision on where to buy frequently has a very high importance rating. The decision of what price to pay is even more important. The decision of how much to buy is also indicated as important. As far as the most crucial decision is concerned, what price to pay clearly comes out the most important, followed after a large margin by how much to buy. Important information needs are also identified.

Table 1 also gives the distribution on the decision to sell. What price to sell comes out to be the most important and crucial. Others which are also important are what to sell, followed by, to whom to sell, and quantity to sell. Table 1 gives the distribution on the production/ gathering/ processing decisions. Here the patterns are less clear. What product/ type/ variety to produce seems to be of considerable importance. Also, quantity to process/ produce and wastage reduction emerge as important. In the most crucial decision, the quantity to process/ produce emerges the highest, followed by wastage reduction. Important information needs are also identified.

### Marketing Information System Design

Based on the theory and framework as well as the findings of the study described above, a marketing information system has been designed. A centralized information system has been planned consistent with the leading role to be played by the state forest department

organization, extensive involvement of the existing govt. staff, as well as the nature of a lot of the information. A special cell created by the government called the Industrial Liaison Unit (ILU) within the Forest Department is proposed to be at the heart of the information system.

The inflow of information to the ILU is described in Figure 7. The District Forest Officers (Extension and Research) (DFO (E&R)) and their staff will play a major role in the collection, compilation and transmission of the information from the source to the ILU. The DFO (E&R) will collect information with respect to various timber products and non-timber forest products (NTFP) from various sources, such as the cultivators, gatherers, depots, traders and processors in the area within their jurisdiction. The information will be collected according to the formats which have been prepared for the marketing information system. It will be compiled according to the instructions provided. The formats will then be sent to the ILU with a copy to the local Conservator of Forests (CF). ILU will also collect information from external sources/ markets.

The ILU will use computers and internet to collect, and then process the received information and prepare output reports following the formats provided in the marketing information system. The system for dissemination of this information is described in Figure 8. The processed information including a **Marketing Information Newsletter** will flow from the ILU to the major forest-based industries, traders and exporters, and also back to the DFO (E&R)s. The DFO (E&R)s will then disseminate the information to various interested agents such as farmers, gatherers, local traders and local processors. The ILU will also communicate the information to the forest department top management, and to the various CFs, and this will help decisions related to the auction trade at the forest product depots.

### **Procedures and Methods for Collection and Presentation**

Systematic collection and reporting of market information will be greatly facilitated by the use of specific special report formats. These will ensure that all the relevant information is systematically collected and reported. Based on the theory and the results of the study, the following formats were specially designed taking into account many factors including the decision-making needs, the availability of information, the organization structure, and considerations for time, accuracy and cognitive behaviour. The formats and system can be readily computerized and put on the internet for rapid and easy reach.

1. *Tree Growing Stock Report* : The objective of this report is to give an assessment of the area under selected species on the government lands, and their approximate maturity.
2. *Tree Felling Plan Report* : The objective of this report is to give an assessment of the estimated production of selected species which is likely to come out over the next five years.
3. *Format for Estimating Average Coupe Yield* : The purpose of this format is to help the staff in estimating the likely yield from different coupes and areas on the basis of the past data.
4. *Tree Felling and Timber Availability Report*: The objective of this report is to give the volume felled and the stocks of selected species of timber on government lands.

5. *Depot Receipt & Disposal Report*: The objective of this report is to give an idea about the receipts and disposal of selected species, as well as stocks, prices and sales at the depots
6. *Depot/Primary Market Price Report*: The objective of this report is to provide information about the prices set, prices realised for selected species and grades, in relation to earlier periods. (see Figure 9)
7. *Secondary Market Price Report*: The objective of this report is to provide information on the prices, price trends and sources for selected species and qualities in secondary markets, such as Nagpur and Raipur as well as others identified in the study.
8. *Final Consumer Wholesale Market Price Report*: The objective of this report is to provide information on the prices, price trends and sources for selected species and qualities in secondary markets, such as Delhi, Mumbai as well as others identified in the study.
9. *Wood Import Report*: The objective of this report is to provide information on the sources, prices and volumes of imports for selected species.
10. *Wood Export Report*: The objective of this report is to provide information on the destinations, prices and volumes of exports for selected species.
11. *Farmer Tree Stock Report*: The objective of this report is to give an assessment of the private tree growing activity being undertaken in different areas, and expected future output. (see Figure 10)
12. *Farmer Tree Felling & Sale Report*: The objective of this report is to give an assessment of the felling activity of private tree growers, and the disposal of the produce including prices realised and destinations.
13. *NTFP Forest Availability Status Report*: The objective of this report is to provide information on the estimated availability and production of selected NTFPs.
14. *NTFP Primary/Local Market Arrival & Price Trend Report*: The objective of this report is to provide information on the market arrival, origin, prices, and price trend for selected NTFPs in primary/local markets. (see Figure 11)
15. *NTFP Secondary Market Price Trend Report*: The objective of this report is to provide an assessment of the origin, prices, price trends, and destinations of selected NTFPs in secondary markets, such as Satna and others identified in the study.
16. *NTFP Final/Major Market Price Trend Report*: The objective of this report is to provide an assessment of the origin, prices, price trends, and destinations of selected NTFPs in final markets, such as Delhi, Chennai, Calcutta and others identified in the study.
17. *Teak Market Report, Sal Market Report, Khamar Market Report, Eucalyptus Market Report, Bamboo Market Report, Mehul Patta Market Report, Lac Market Report, Safed Musli Market Report* :These informative commodity output reports which will be produced by the ILU after compilation and analysis of all the relevant information collected.
18. *Marketing Information News Letter*: This main, comprehensive and concise output report on the market information will be produced periodically by the ILU, providing key information and analysis based on all the information collected, and will seek to provide key inputs of market information and analysis to all relevant users. (See Figure 12)

### **Concluding Observations**

The marketing information system has been designed with the objective of improving the marketing of the forest and agro-forest products, by providing clear and rapid transmission of



market signals, and fostering better informed decision-making. In implementing it, computers and internet must be used extensively and will bring a quantum leap in speed, content and reach. The centralized structure of the system will be effective because it is compatible with the hierarchical structures within the organization. It will also be effective because in most cases the individual elements of the market information become significantly more meaningful only when centralized and put together with other pieces of information such as other local, historical, national and international information. The Marketing Information Newsletter will play a major role in making the information and analysis widely available, and through this help the market related decision-making on a wide scale. This should improve the link between demand and supply, and make the production and the marketing of forest products considerably more efficient and effective.

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**Table-1**  
**Important Decisions and Information Frequency Distribution**

Sr. No.	Decision	Rating					Total	Most Crucial Decision	Information which Would Help
		1	2	3	4	5			
<b>Buying Decisions</b>									
1	What to buy?	0	0	5	1	10	16	5	Avail., Demand
2	Where to buy?	0	0	18	0	23	41	5	Avail., Price
3	When to buy?	2	0	10	0	15	27	2	Trends, Supply
4	From whom to buy?	0	0	4	0	1	5	0	Markets, Source
5	How much to buy?	0	0	11	1	21	33	11	Demand, Supply
6	What price to pay?	0	0	5	0	33	38	27	Prices, Trends
7	What quality?	0	0	2	0	13	15	9	Demand
8	What Services?	0	0	2	0	0	2	1	Avail.
9	Others	0	0	0	0	0	0	0	
<b>Selling Decisions</b>									
1	What products/type to sell?	0	1	4	0	9	14	1	Avail., Stocks
2	Where to sell?	0	0	33	1	12	46	1	Prices, Demand
3	When to sell?	0	0	24	2	25	51	6	Price trends
4	To whom to sell?	0	0	20	0	17	37	1	Prices
5	Quantity to sell?	0	0	12	0	17	29	3	Trends, Stocks
6	What price to sell?	0	0	21	2	43	66	47	Prices, Trends
7	Costs to incur	0	0	0	0	0	0	0	Alter., Demand
8	Services	0	0	2	0	5	7	2	Avail.
9	Others	0	0	0	0	0	0	0	
<b>Production/Gathering/Processing Decisions</b>									
1	What product/type/variety to produce?	0	0	4	0	15	19	2	Demand, Avail., Prices
2	Where to produce?	0	1	20	2	2	25	3	Prices
3	When to produce?	1	0	16	1	6	24	5	Prices, Trends
4	Quantity to process/produce	0	0	15	0	14	29	18	Stocks, Avail., Demand
5	Capital input to use	0	0	0	0	0	0	0	Profit margins
6	Labour input to use	0	0	0	0	1	1	0	Profit margins
7	Other inputs to use	0	0	0	0	0	0	0	
8	Quality control	0	0	2	0	8	10	8	Demand, Supply
9	Wastage reduction	0	0	2	0	11	13	12	Type in Demand
10	Others	0	0	0	0	0	0	0	

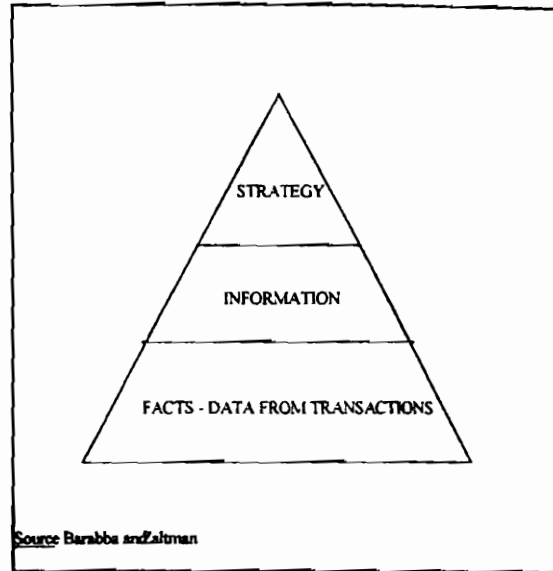
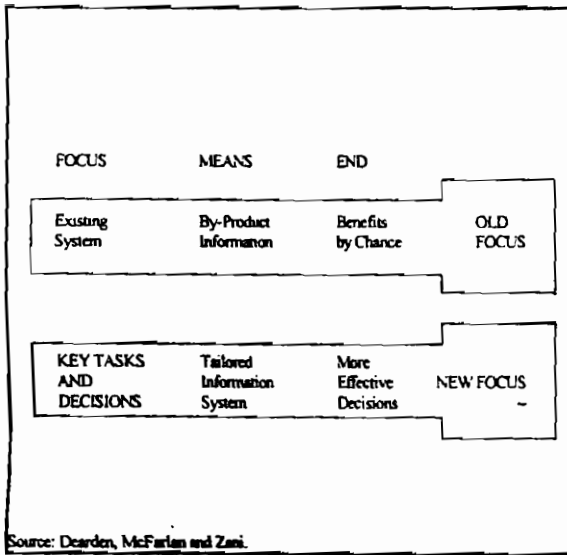


Figure 1: Design Information Systems – Old and New Approaches

Figure 2: The Information Pyramid

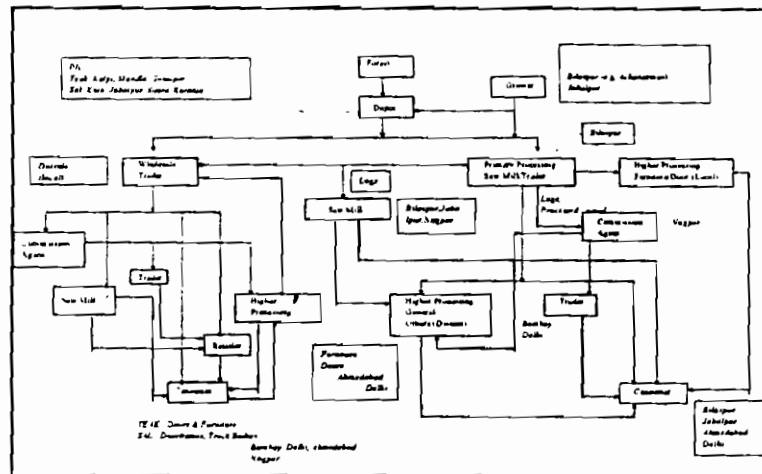
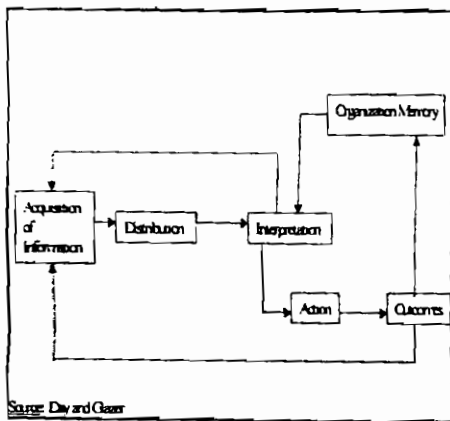


Figure 3: Information and Organization Learning Process

Figure 4: Teak/Sal/Khamar: Marketing System

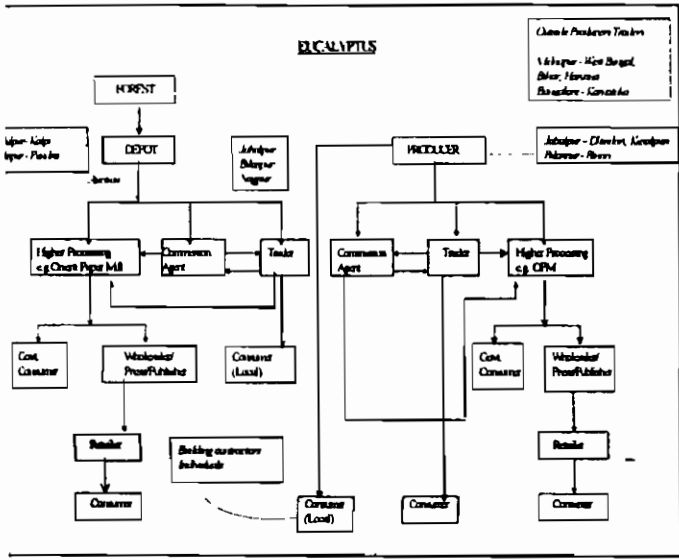


Figure 5: Eucalyptus: Marketing System

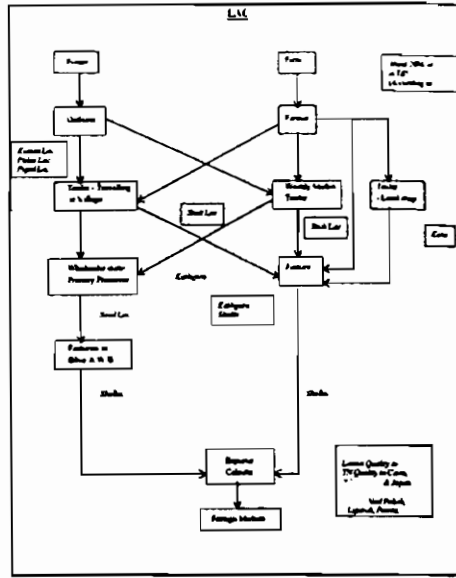


Figure 6 : Lac: Marketing System

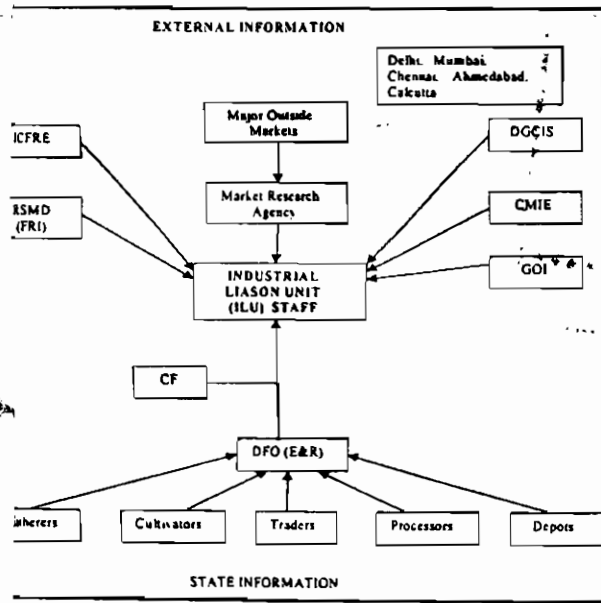


Figure 7: Marketing Information System: Inflow Structure

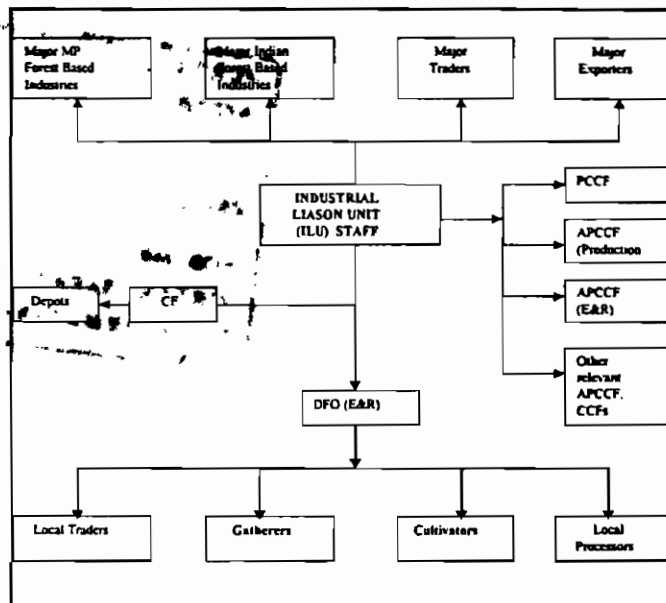


Figure 8: Marketing Information System: Outflow Structure

Report/Primary Market Price							
Bj. ....							
Depot/Market Date of Auction							
Species	Grades & mid-classes System	Volume up auction	Volume in	Average unit (put)	Average sale	Average price of auction	Average price of year
Rowed TEA	Teak I 10-40 91-120  II 10-40 91-120  Other grades size						
SA							
Other							

\*Based on Results  
To be prepared by DFO (E&R) and

Figure 9: Depot/Primary Market Price Report

Farmer Tree Stock Report					
Annual					
Circle District _____ Species (Eucalyptus/Katmer/Bambusa)					
Date _____					
Kind of production	Block	Estimated no. of farmer's growing	Estimated total area	Year of planting	Estimated volume
Private Plantation				Newly planted 1-2 yrs. 2-5 yrs. 5-10 yrs.	
Private Forest					

To be prepared by DFO (E&R) and sent to ILL with copy to CF

Figure 10: Farmer Tree Stock Report

NTFP Primary/Local Market Arrival & Price Trend Report							
Quarterly							
Market _____							
Date _____							
Species/Products	Quality	Origin	Estimated quantity annual	Average unit value (Price)	Estimated total value	Price 1 quarter ago	Price 1 year ago
MELURITA							
LAC							
SAPINDU							

To be prepared by responsible officer or assigned representative to ILL, with copy to CF

Figure 11: NTFP Primary/Local Market Arrival & Price Trend Report

Quarterly	
News, Highlights and Analysis from the Chief of ILL & his staff	
-	Major market highlights
-	Recent trends
-	Recent developments
-	Results of latest analysis
Timber and Wood Markets	
Price Trends by Major species (Average of a suitable price)	
-	Graph on trend in final market prices
-	Graph on trend in secondary market prices
-	Graph on trend in primary market prices
-	Graph on trend in international prices
Local Supply Trends by Major Wood species	
-	Graph on trend in wood supply including projection into the future
Import/Export Trends by Major Wood Species	
-	Graph on trend in wood supply by imports/exports
Non-timber Forest Products	
Price Trends by Major Products (Average of a suitable price)	
-	Graph on trend in Urban market prices
-	Graph on trend in Rural market prices
-	Graph on trend in International market prices
Supply Trends by Major Products	
-	Graph on trend in supply including projection into the future
Import/Export Trends by Major Products	
-	Graph on trends in Import/Export
Special Articles on Major Trends and Developments	
These should be read and the ILL as well as other staff should be encouraged to contribute. ICFRE institutions and other institutions may also contribute.	

Figure 12: Marketing Information News Letter

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