

## MANAGEMENT ANALYSIS OF THE TIMBER INDUSTRY IN LAVRAS, MINAS GERAIS STATE

Rosa Maria Miranda Armond Carvalho<sup>1</sup>, Lourival Marin Mendes<sup>2</sup>, Rommel Noce<sup>3</sup>, Rafael Farinassi Mendes<sup>4</sup>

(received: February 1st, 2007; accepted: February 27, 2009)

**ABSTRACT:** This study analyzed the sawn timber industry in Lavras county – MG state with emphasis on aspects of contextual and structural subsystems. A survey was conducted with organizations composing the local timber production chain to establish agreement rating measures related to the aspects in question. It was noted that, regardless of their position in the timber production chain, organizations did not present significant differences concerning adjustment and development of contextual and structural subsystems.

Key words: Management systems, industrial organization, sawn lumber industry.

### ASPECTOS DE GERENCIAMENTO NA INDÚSTRIA DA MADEIRA EM LAVRAS – MINAS GERAIS

**RESUMO:** No sentido de contribuir com a construção de uma visão sobre a indústria de madeira serrada de Lavras/MG, o presente estudo enfoca os sistemas de gerenciamento considerando aspectos relacionados aos subsistemas contextual e estrutural. Realizou-se censo com as empresas que compunham a cadeia produtiva da madeira de forma a estabelecer medidas de posição de concordância em relação aos aspectos analisados. Notou-se que as empresas independentemente da sua localização na cadeia produtiva da madeira, não guardavam entre si diferenças significativas no que diz respeito à adequação e desenvolvimento dos subsistemas contextual e estrutural.

*Palavras-chave:* Sistemas de gerenciamento, organização industrial, indústria de madeira serrada.

#### 1 INTRODUCTION

In recent decades, several transformations in the global arena have forced and continue to force deep changes in the processes of production restructuring in virtually every sector of human activity. These transformations have forced policy makers to pursue new conceptions of public intervention in regional spaces, ultimately seeking to respond on new grounds to challenges of regional development.

Different scholars of the development process, including Amaral Filho (1999), Amorim (1998) and Cassiolato & Lastres (2000), argue that, in order to face the solid array of obstacles that jeopardize competitiveness, organizations increasingly need to adopt new organizational methods that will empower them to react positively to such challenges.

Thus, knowing the organizational structure and production process is key to identify obstacles and

opportunities and to improve management by integrating different aspects correlated to organizational excellence. Porter (1992) argued that industrial structure influences competitiveness and feasible strategies for organizations.

To contribute to the development of the sawn lumber industry of Lavras/MG and to implement feasible strategies aiming at regional development, this study focused on management systems emphasizing aspects of two levels of organizational analysis, namely contextual and structural subsystems.

The specific objectives were to explore and describe aspects related to strategies, upper management, organizational culture and values; and to explore and describe aspects related to organizational structure, human resource management, production and financial process management, product development and quality assurance, trade and marketing as well as environmental management.

<sup>1</sup>Administrator, Researcher DS. in Forest Science – Departamento de Engenharia Florestal/DEF – Universidade Federal de Viçosa/UFV – 36570-000 – Viçosa, MG – rosamaria@homenet.com.br

<sup>2</sup>Forest Engineer, DS in Forest Engineering – Departamento de Ciências Florestais/DCF – Universidade Federal de Lavras/UFLA – Cx. P. 3037 – 37200-000 – Lavras, MG – lourival@ufla.br

<sup>3</sup>Administrator, DS Candidate in Forest Science – Departamento de Engenharia Florestal/DEF – Universidade Federal de Viçosa/UFV – 36570-000 – Viçosa, MG – rommelnoce@yahoo.com.br

<sup>4</sup>Candidate to an Academic Degree in Forest Engineering – Universidade Federal de Lavras/UFLA – Cx. P. 3037 – 37200-000 – Lavras, MG – rafael\_farinassi@hotmail.com

**2 MATERIAL AND METHODS**

**2.1 Population**

The scope of this research included organizations in the timber production chain situated in Lavras, Minas Gerais state. Data collection was done in the form of a census survey.

To find local businesses operating in the sector in order to carry out the analysis, we resorted to institutions specialized in registration and training, including: local government development secretariat, State Forest Institute (IEF), Federation of Industrial Organizations of Minas Gerais State (FIEMG) and Industrial Development Institute of Minas Gerais (INDI). The information was cross-referenced and a list of 21 organizations was generated.

The field of activity of participating organizations is described in Table 1.

**2.2 Collection, handling and data analysis**

Data were collected between April and September 2006 using primary and secondary sources.

The tool used for data collection was prepared by the authors and consisted of questions concerning the organizations' management system, with assertions (Ass) to which respondents assigned agreement ratings as applicable.

Replies to assertions varied according to the Likert scale and are as follows: (5) – Strongly Agree, (4) – Agree, (3) – Partially Agree, (2) – Disagree and (1) – Strongly Disagree. As a measure mechanism, the Likert scale helps gauge the degree of agreement and importance assigned to the assertions by respondents (OLIVEIRA, 2005). It should be noted that respondents were people in leadership positions.

A weighted value was derived through data handling, which indicated the position of the group formed by different business sectors on each assertion. To that end, the data were transferred to Microsoft Excel

spreadsheets readily prepared for computing the values obtained by multiplying the occurrence observed by the weight attributed to each level, in relation to each factor or variable. The value obtained in the sum was divided by the maximum value obtainable by the factor, that is to say, if all respondents chose the highest rating level for a specific factor. The value obtained by this division was multiplied by ten so as to quantify the factor or variable in question on a scale of 0 to 10. The mathematical expression of calculations made to quantify the variables is illustrated above:

$$WV = \frac{\sum_{i=1}^k f_i w_i}{3k} \cdot 10$$

Source: Adapted from Spiegel (1985).

Where:

WV = weighted value

k = no. of occurrence

f<sub>i</sub> = frequency at level

w<sub>i</sub> = weight associated to level

Weighted value 6 was set as a boundary line since, should hypothetically all respondents adopt a central position on the assertions and choose 'partially agree', 6 would be the weighted value. Therefore, results above six were regarded as agreeing position while results below six were regarded as disagreeing position.

**3 RESULTS AND DISCUSSION**

**3.1 Strategies and upper management**

Only one of the inquired organizations has well defined mission, vision and objectives. The practice of formalized strategic planning was not adopted by any organization.

As regards to strategies and management, assertions covered some core characteristics (Table 2)

**Table 1** – Activity sector of organizations.

**Tabela 1** – Setor de atividade das empresas.

Activity sector	Quantity of organizations inquired
Woodworking	13
Handcraft	4
Woodworking and handcraft	1
Lumber sawmill and retailer	2
Billiards & table games manufacturers and traders	1
Total	21

effectively associated with management. It should be noted that the handcraft business and three of the woodworking businesses had no employees.

The agreement rating given especially by woodworking businesses revealed that some elements could still be improved to help disseminate knowledge throughout the organization. It was therefore noted that competencies, global strategy and challenging goals could be better disseminated to all members of the organization.

### 3.2 Organizational culture and values

Organizational culture translates as standards and values that interpret events and assess what is suitable or unsuitable for the organization (Table 3).

The agreement rating given to organizational culture and values suggested an environment reasonably favorable for creation, dissemination and storage of organizational knowledge, though the practice of informal meetings outside the workplace for

**Table 2** – Assertions about strategies and upper management.

**Tabela 2** – *Afirmativas relacionadas a estratégias e alta administração.*

Assertions	Activity*				
	1	2	3	4	5
As1 The organization's global strategy is clearly communicated to all organizational levels	7.6	6.0	-	8.0	8.0
As2 Leaders have a clear vision of what the organization should be like in the future	7.8	10.0	8.0	10.0	6.0
As3 There is a consensus about what are the organization's strong and weak points	7.8	10.0	9.0	10.0	10.0
As4 The management establishes challenging goals	8.0	10.0	7.0	10.0	6.0
As5 The organization's performance and results are often assessed	6.4	4.0	6.0	10.0	10.0

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 3** – Assertions about organizational culture and values.

**Tabela 3** – *Afirmativas relacionadas à cultura e valores organizacionais.*

Assertions	Activity*				
	1	2	3	4	5
As6 There is a great sense of trust between organization and employees	8.8	10.0	-	10.0	10.0
As7 Employees take great pride in working for the organization	8.0	10.0	-	10.0	10.0
As8 People are focused on things other than short-term activities only	7.4	6.0	-	8.0	2.0
As9 Experimentation is incited and there is room for trial and error	7.6	10.0	-	8.0	7.0
As10 People are concerned about the whole organization rather than with their own field of work	7.8	10.0	-	6.0	6.0
As11 New ideas are valued	7.2	10.0	-	10.0	8.0
As12 Major achievements are celebrated	7.2	2.0	-	2.0	2.0
As13 Informal meetings are often held outside the workplace for formulation of ideas	7.6	6.0	-	6.0	2.0
As14 The organization's layout facilitate exchange of information (use of open spaces and meeting rooms)	9.4	10.0	-	10.0	10.0

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

formulation of ideas was not frequent among the organizations inquired.

### 3.3 Organizational structure

By inferring the number of hierarchical levels (Table 4) in the organizational structure, organizations were found to have an overall lean structure.

Among the organizations studied, nine used no business management tools. And among those that did use, they emphasized stock inventory and cash flow management, followed by management cost, which proves consistent with the importance assigned to finance sector and production sector (Table 5).

Computer applications were found to be used scarcely in the management of activities (Table 6).

### 3.4 Human resource management

Human resource management addresses recruitment

& selection and award mechanisms (Table 7).

As regards recruitment and selection, the agreement rating was considered average, demonstrating only relative concern on the part of organizations when seeking the ideal professional for a specific position.

As regards the award mechanisms, the agreement rating was found to be low for most assertions. Absence of share interest mechanisms for employees was a unanimous reply.

Most organizations offered no benefits to employees, and out of the three organizations that did offer, one offered loans while the other two offered profit-sharing schemes, demonstrating little use of this tool. As for difficulties with the group of collaborators, the most commonly cited was lack of motivation, followed by poor level of education and lack of training (Table 8).

The training of collaborators occurred mainly during working hours (Table 9).

**Table 4** – Number of hierarchical levels in the organizational structure down to execution level.

**Tabela 4** – Número de níveis hierárquicos na estrutura organizacional até o nível de execução.

Activity	Quantity of organizations	Quantity of hierarchical levels
Woodworking	8	2
Woodworking and handcraft	5	3
Woodworking and handcraft	1	2
Handcraft	-	-
Lumber sawmill and retailer	1	5
Lumber sawmill and retailer	1	3
Billiards & table games manufacturers and traders	1	4

**Table 5** – Use of business management tools.

**Tabela 5** – Utilização de instrumentos de gestão empresarial.

Category/Function	Activity*					Quantity of organizations
	1	2	3	4	5	
Cash flow management	7	-	2	1	1	11
Stock inventory	7	1	2	-	1	11
Costs	7	-	2	-	1	10
Partnership with suppliers/customers	-	-	-	-	1	1
Investment planning	2	-	-	-	-	2
Performance indicators	-	-	-	-	1	1
Quality system	1	-	-	-	-	1
None used	6	-	2	1	-	9

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 6** – Activities involving use of computer applications.**Tabela 6** – Atividades em que a empresa utiliza aplicativos de informática.

Category/Function	Activity*					Quantity of organizations
	1	2	3	4	5	
Accounting/administration	3	-	-	-	1	4
Sales management and relationship with customers	-	-	-	-	1	1
Purchase management and relationship with suppliers	2	1	-	-	1	4
Stock inventory management	4	-	-	-	1	5
Word processor	3	1	-	-	1	5
Electronic spreadsheets	2	1	-	-	1	4
Database	-	-	-	-	1	1
Specific software	2	1	-	-	1	4
None used	8	-	4	1	-	13

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 7** – Assertions about recruitment and selection.**Tabela 7** – Afirmativas relacionadas a recrutamento e seleção.

Assertions	Activity*				
	1	2	3	4	5
As15 The selection process is very strict	6.8	8.0	-	8.0	6.0
As16 There is great investment and incentive to staff training and to professional and personal development	5.4	10.0	-	8.0	4.0
As17 Learning is fomented through networking and interaction with other people within and outside the organization	5.4	10.0	-	7.0	4.0
As18 Employees have a high level of expertise in production technologies	8.2	10.0	-	6.0	10.0
As19 The organization has a low absenteeism rate	9.0	10.0	-	10.0	10.0
As20 Training is associated to employees' work requirements or to the organization's strategy	8.2	10.0	-	8.0	10.0
As21 Staff resignation or dismissal figures are low comparatively to other organizations	8.6	8.0	-	10.0	10.0
As22 The annual rate of occupational accidents is low	7.8	10.0	-	8.0	10.0
As23 The internal business environment is pleasant	8.6	10.0	-	10.0	10.0
As24 Salary increase is associated with competence rather than to position held	4.2	8.0	-	8.0	8.0
As25 There are award and recognition mechanisms for delivered results and extraordinary contributions	4.8	10.0	-	8.0	2.0
As26 There are compensation mechanisms associated to team performance (as opposed to individual performance only)	6.8	6.0	-	6.0	6.0

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 8** – Main difficulties with the group of collaborators.**Tabela 8** – Principais dificuldades relacionadas ao quadro de colaboradores.

Category/Function	Activity*					Quantity of organizations
	1	2	3	4	5	
Poor level of education	3	-	-	1	-	4
Lack of training	4	-	-	-	-	4
Lack of motivation	5	-	-	1	-	6
Punctuality / assiduity	1	-	-	1	-	2
None specified	2	1	-	-	1	4

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 9** – Main forms of training offered to collaborators.**Tabela 9** – Principais formas de treinamento oferecidas aos colaboradores.

Category/Function	Activity*					Quantity of organizations
	1	2	3	4	5	
In the organization, outside working hours	1	1	-	1	-	3
During working hours (as work unfolded)	11	1	-	2	1	15
In the organization and in specialized institutions	1	-	-	-	-	1
Promoted by suppliers or customers	2	-	-	-	-	2
No training offered	-	-	-	-	-	-

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

None of the inquired organizations engaged in formal mechanisms to receive suggestions from employees, e.g. systematic meetings, suggestions box or participative groups. Yet they were unanimous in that suggestions were informally put forward on a routine basis and accepted most of the time.

### 3.5 Production process management

As for aspects of production management, special mention is given to production process management (Table 10), product development (Table 11) and quality assurance (Table 12).

Examining the replies to aspects of production process management, the production area was found to be relatively structured in most cases. The existence of idle capacity is also worth mentioning, as only lumber sawmills and retailers affirmed to operate at full production capacity.

Product development has become a key subject in industrial competitiveness. Ever increasing competitiveness, fast technological changes, reduced product life cycle and increasingly demanding consumers

require agility, productivity and high quality from organizations, which in turn is necessarily dependent on each organization efficiency and efficacy throughout the process.

As regards product development assertions, the given agreement rating suggested little concern on the part of woodworking businesses about developing mechanisms to help create new products.

A crucial area of every production process, quality assurance is a supporting item that entails procedures, suitable equipment as well as qualified and trained personnel that, jointly with other components involved in production processes, develop the necessary steps to ensure product homogeneity and quality.

The given agreement rating demonstrated that on the whole organizations assigned value to quality aspects of their products and pursued quality enhancing mechanisms.

### 3.6 Information system, logistics and result assessment

Information systems are defined as a combination of human and computer resources that enable collection,

**Table 10** – Assertions about production process management.**Tabela 10** – *Afirmativas relacionadas a gestão de processos produtivos.*

Assertions	Activity*				
	1	2	3	4	5
As27 The organization operates at full production capacity	6.0	8.0	3.3	10.0	6.0
As28 The organization performs strict production monitoring and control	9.8	8.0	7.3	10.0	6.0
As29 The organization systematically engages in process development and planning	7.8	2.0	2.0	2.0	6.0
As30 The organization has great concern about technological updating	6.2	10.0	2.0	10.0	6.0
As31 The organization's production capacity is in line with the specified tolerance of its projects	9.8	10.0	10.0	10.0	10.0
As32 Most orders are ready and delivered within the deadline	9.4	6.0	7.3	10.0	9.0

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 11** – Assertions related to product development.**Tabela 11** – *Afirmativas relacionadas a desenvolvimento de produtos.*

Assertions	Activity*				
	1	2	3	4	5
As33 The organization has a policy on new products	5.0	10.0	8.0	10.0	10.0
As34 The organization uses methodologies and tools for new product development	6.2	6.0	8.0	2.0	6.0
As35 The organization designs the portfolio of its products	5.4	10.0	9.0	10.0	8.0

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 12** – Assertions about quality assurance.**Tabela 12** – *Afirmativas relacionadas à garantia de qualidade.*

Assertions	Activity*				
	1	2	3	4	5
As36 The organization has great concern about the quality aspect	9.8	10.0	10.0	10.0	10.0
As37 The organization has mechanisms to assess and rate suppliers	7.0	6.0	6.0	10.0	10.0
As38 The organization has mechanisms to assess and rate business partners	3.8	2.0	2.0	10.0	2.0
As39 The organization has a low internal fault rate in the production process	9.4	8.0	10.0	10.0	10.0
As40 The organization has a low scrap and rework cost	9.8	8.0	10.0	10.0	10.0

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

storage, retrieval, distribution and use of data, for the purpose of improving managerial efficiency within organizations. Assertions about information systems are described in Table 13.

As regards information systems, the agreement rating provided by the replies was overall low, and so was the agreement rating for assertions about the internal business environment.

The sampled organizations do use some information sources and specialized knowledge (Table 14).

The search for information seemed a concern in most organizations. It should be noted, however, that most information sources were available to all organizations, which could indicate that any knowledge obtained was not exclusive and therefore was susceptible of being copied by prospective competitors.

**Table 13** – Assertions about information systems.**Tabela 13** – *Afirmativas relacionadas a sistemas de informação.*

Assertions	Activity*				
	1	2	3	4	5
As41 The organization is well equipped with computer systems	3.4	6.0	2.0	7.0	6.0
As42 The organization systematically manages data	2.6	8.0	2.0	6.0	6.0
As43 There is strong discipline, efficiency and incentive to document knowledge and experience in the organization	2.6	6.0	2.0	10.0	6.0
As44 Information is shared. All employees are given easy access to the organization's database and knowledge	6.0	10.0	-	5.0	6.0
As45 The organization shares information with the market	6.4	8.0	8.0	6.0	6.0

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 14** – Use of information sources and specialized knowledge.**Tabela 14** – *Utilização de fontes de informação e conhecimentos especializados.*

Information source	Activity*					Quantity of organizations
	1	2	3	4	5	
Previous experience of team	4	-	-	-	1	5
Specialist advice	2	-	-	-	-	2
Universities and technological centers	4	-	-	-	1	5
Specialized publications	7	1	2	-	1	11
Information exchange with organizations, customers, suppliers etc	8	1	2	1	1	13
Conventions and trade & industrial fairs	7	1	2	-	1	11
Technical catalogues	5	1	2	1	1	10

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

Logistic activities were designed to administer fully and coherently the flow of materials from arrival until departure (Table 15).

The given agreement rating demonstrated that on the whole organizations were developing mechanisms for the aspects in question.

Today, result assessment constitutes an important tool for organizations, acting as boundary line for all company components (Table 16).

After examining aspects of result assessment, it was observed that, despite relative concern with measuring different results, these results were not widely disseminated internally, except for billiards & table games manufacturers and traders.

### 3.7 Financial management, trade and marketing

Financial management covers a series of activities

focused predominantly on the protection of organizations financial assets (Table 17).

The high agreement rating given to aspects of financial management reaffirmed the degree to which the financial area of organizations is structured. It should be noted that none of the organizations assented to availability of suitable finance facilities.

Tables 18, 19, 20 and 21 refer to areas in which the organization invested and/or intended to invest in 2006.

Bearing in mind the 'marketing' concept, it can be said that one of the most important actions to be taken by an organization is to identify the needs, desires and values of a chosen segment or 'market' and to adapt in order to ensure such needs and desires are met.

The agreement rating given to aspects of marketing management are illustrated in Table 22.



**Table 15** – Assertions about logistics.**Tabela 15** – *Afirmativas relacionadas à logística.*

Assertions	Activity*				
	1	2	3	4	5
As46 The organization has great concern about managing its external logistics	6.2	2.0	2.0	9.0	10.0
As47 The organization has well defined internal handling and storage processes	8.0	10.0	6.0	10.0	10.0
As48 Suppliers honor raw material delivery deadlines	8.8	10.0	10.0	8.0	10.0
As49 The organization has mechanisms for balancing its personnel and product handling issues	6.2	10.0	6.0	10.0	8.0

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 16** – Aspects related to result assessment.**Tabela 16** – *Aspectos relativos à mensuração de resultados.*

Assertions	Activity*				
	1	2	3	4	5
As50 There is great concern about assessing results from various approaches (financial, operational, strategic, acquisition of knowledge)	8.8	6.0	6.0	10.0	2.0
As51 Results are widely disseminated internally	6.2	2.0	-	5.0	10.0

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 17** – Aspects related to financial management.**Tabela 17** – *Aspectos relativos à gestão financeira.*

Assertions	Activity*				
	1	2	3	4	5
As52 There is a wide array of finance facilities available and suitable	3.6	2.0	2.0	4.0	2.0
As53 The organization has a strict process to control budget & actual expenditure	8.0	4.0	2.0	8.0	10.0
As54 The organization systematically measures its financial performance	7.6	4.0	2.0	10.0	10.0
As55 The organization manages costs	6.0	4.0	10.0	10.0	10.0

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 18** – Actual and intended investments related to the production area.**Tabela 18** – *Investimentos e pretensão de investimentos relativos à área de produção.*

Investment in production	Activity*					Quantity of organizations
	1	2	3	4	5	
Acquisition of machinery and equipment	8	1	3	1	-	13
Process and product development	3	-	2	-	-	5
No actual or intended investment	3	-	1	1	1	6

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 19** – Actual and intended investments related to the market area.**Tabela 19** – Investimentos e pretensão de investimentos relativos a mercado.

Investment in the market	Activity*					Quantity of organizations
	1	2	3	4	5	
Innovative products launched	-	-	1	-	-	1
No actual or intended investment	13	1	3	2	1	20

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 20** – Actual and intended investments related to the management area.**Tabela 20** – Investimentos e pretensão de investimentos relativos à gestão.

Investment in management	Activity*					Quantity of organizations
	1	2	3	4	5	
Hiring / training of human resources	2	-	-	1	-	3
No actual or intended investment	11	1	4	1	1	18

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 21** – Actual and intended investments related to environmental management.**Tabela 21** – Investimentos e pretensão de investimentos relativos à gestão ambiental.

Investment in environmental management	Activity*					Quantity of organizations
	1	2	3	4	5	
Treatment of solid residues	1	-	-	-	-	1
No actual or intended investment	12	1	4	2	1	20

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 22** – Aspects of marketing management.**Tabela 22** – Aspectos relativos a gestão de “marketing”.

Assertions	Activity*				
	1	2	3	4	5
As56 The organization resorts to strategic alliances for placement of its product	2.0	2.0	2.0	2.0	2.0
As57 The organization is concerned and cautious about its market image	10.0	10.0	8.0	10.0	10.0

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

The agreement rating given to aspects of marketing management demonstrated that, despite showing concern about their market image, organizations would not seek strategic alliances for placement of their products.

Most organizations resorted to few merchandising methods (Table 23).

It was noted that few trading methods were adopted (Table 24) and overall organizations preferred direct contact with end customers.

As regards contact with customers, methods did not vary greatly, as is illustrated in Table 25.

All 21 organizations did informal surveys about customer needs, occasionally keeping records. As for

implementing customer suggestions, all organizations affirmed to adopt such suggestions either partially or fully.

Most organizations chose not to use any advertising method. Out of the eight companies that did use, most preferred participation in fairs (Table 26).

### 3.8 Environmental management

An environmental management system enables organizations to control continuously the environmental

effects of production processes, from choice of raw material to the product's final destination and including liquid, solid, and gas residues, thus ensuring as much sustainability as possible (Table 27).

The agreement rating given to aspects of environmental management indicated that organizations pay little attention to environmental issues. Yet they fully recycled residues from production processes (sawdust and wood stubs).

**Table 23** – Merchandising methods used.

**Tabela 23** – Atuação nas áreas de “marketing”.

Merchandising method	Activity*					Quantity of organizations
	1	2	3	4	5	
Pricing policy	1	-	-	-	-	1
Advice to buyers	1	-	-	-	1	2
Promotions	1	-	1	-	1	3
After-sale service	8	-	-	-	1	9
Participation in fairs	1	1	3	1	-	6
Sales training	-	-	-	-	1	1
No method used	5	-	-	1	-	6

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 24** – Trading method between organization and customer.

**Tabela 24** – Modalidade de comercialização estabelecida entre a empresa e o cliente.

Trading method	Activity*					Quantity of organizations
	1	2	3	4	5	
Directly with end consumer (individual or corporate body)	12	1	4	2	1	20
Through an agent (company hired)	1	-	-	-	-	1

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 25** – Contact methods with customers.

**Tabela 25** – Forma de contato com os clientes.

Contact with customers	Activity*					Quantity of organizations
	1	2	3	4	5	
Personal contact on company premises	12	1	-	2	1	16
Through representatives	1	-	-	-	-	1
In craft fair	-	-	4	-	-	4

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 26** – Advertising methods used.**Tabela 26** – Formas de propaganda utilizadas pelas empresas.

Advertising	Activity*					Quantity of organizations
	1	2	3	4	5	
Specialized newspapers and magazines	2	-	-	-	-	2
Gifts	2	-	-	-	1	3
Event sponsorship	1	1	-	-	1	3
Fairs	-	-	4	-	-	4
Electronic media	2	-	-	-	1	3
Newspapers and magazines	1	-	-	-	-	1
No method used	10	-	-	2	-	12

\* 1 - Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

**Table 27** – Aspects related to environmental management.**Tabela 27** – Aspectos relativos à gestão ambiental.

Assertions	Activity*				
	1	2	3	4	5
As58 The organization adopts environmental strategies	2.0	10.0	2.0	2.0	2.0
As59 The organization uses environmental management tools	2.0	2.0	2.0	2.0	2.0
As60 The organization distinguishes itself from business competitors by its environmental actions	2.0	10.0	2.0	2.0	2.0

\* 1 – Woodworking, 2 - Woodworking and handcraft, 3 - Handcraft, 4 - Lumber sawmill and retailer, 5 - Billiards & table games manufacturers and traders.

#### 4 CONCLUSIONS

An effective implementation of strategies was hindered by lack of strategic planning.

The business environment was generally favorable for creation, dissemination and storage of organizational knowledge.

Organizations needed to improve their ability to face adversities in their local business environment, despite their flexible structure.

Partnerships and service rendering were not disseminated practices, and the use of multidisciplinary, temporary teams and reshuffling was not present in organizations of the timber production chain.

The use of business management tools and computer applications was not widely disseminated. Employees focused on cash flow, stock inventory and cost management.

Most organizations were not concerned about hiring suitable professionals or about award mechanisms.

Poor level of education along with lack of motivation

or training proved the main difficulties to be faced regarding the group of collaborators.

Concern about product quality was unanimous, despite the little effort to develop new products.

Organizations did accept employees' suggestions, despite lacking a formal mechanism to receive them.

The existing idle capacity in the organizations implied that new job positions could be created.

Their information systems lacked efficient information sharing mechanisms.

Few investments were made, which was consistent with recently perceived market downturn.

Efforts to develop logistics focused on internal and external aspects, though most organizations failed to assess results systematically.

Trading methods and merchandising mechanisms proved limited, though organizations did seek knowledge about customer needs.

Overall, organizations paid little attention to environmental issues, though they recycled residues.

Regardless their position in the timber production chain, the organizations inquired in this study did not present significant differences concerning adjustment and development of contextual and structural subsystems. That could be verified not only by the nature of the products on offer but also by the management tools used.

### 5 ACKNOWLEDGMENTS

The authors wish to thank the Research Aid Foundation of Minas Gerais State – FAPEMIG.

### 6 BIBLIOGRAPHICAL REFERENCES

AMARAL FILHO, J. A endogeneização no desenvolvimento econômico regional. In: ENCONTRO NACIONAL DE ECONOMIA, 27., 1999, Belém, PA. *Anais...* Belém: ANPEC, 1999.

AMORIM, M. **Clusters como estratégia de desenvolvimento industrial no Ceará.** Fortaleza: Banco do Nordeste, 1998. 100 p.

CASSIOLATO, J. E.; LASTRES, M. M. **Arranjos e sistemas produtivos locais e proposições de políticas de desenvolvimento industrial e tecnológico.** Rio de Janeiro: Instituto de Economia da Universidade Federal do Rio de Janeiro, 2000.

OLIVEIRA, T. M. V. **Escalas de mensuração de atitudes:** Thurstone, Osgood, Stapel, Likert, Guttman, Alpert. Disponível em: <[http://www.fecap.br/adm\\_online/art22/tania.htm](http://www.fecap.br/adm_online/art22/tania.htm)>. Acesso em: 4 mar. 2005.

PORTER, M. E. **Vantagem competitiva:** criando e sustentando um desempenho superior. Rio de Janeiro: Campus, 1992. 512 p.

SPIEGEL, M. R. **Estatística.** São Paulo: McGraw-Hill, 1985. 454 p.