

## STSM REPORT

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**STSM Topic:** FORSYS

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### 1. Purpose of the visit

The objective of this document is to present an approach developed for integrating stakeholders into the decision making process in forest management, using the Enterprise Architecture method. This study involves a coupling of approaches from operations analysis and management science to help the decision making process. The aim is to enhance the predictive capacity of forest management models for the Mediterranean region. The preliminary results of this study provide the basis of human decision making in the management of forest resources for the region of Chamusca, Portugal. This information will provide a unique opportunity to integrate the complexity of human decisions into decision support systems for the use in forest management.

#### 1.1 Aim of the stakeholder consultation

The primary aim of the stakeholder consultation is to improve the effectiveness or efficiency of the forest management in Chamusca; more precisely:

- to develop approaches for integrating stakeholders into the decision making process for forest management under global change; and
- to enhance decision processes and optimize adaptive forest ecosystem management planning based on stakeholders consultation.

The participation of forest owners and managers in the process of modelling builds a sense of ownership of the planning decision. Furthermore, it opens possibilities for involving complex

simulation models into the practical application of management planning. Finally, the iterative visual approach allows for an investigation of the decision making process for anyone interested in management outcomes (Lau et al., undated).

In this document, we focus on the first level of stakeholder consultation, for which recommendations for integrating into the modelling approach can be formulated.

## **2. Materials and methods**

### **2.1 Case study region – Chamusca, Portugal**

Located 140km east of Lisbon, Chamusca is a municipality in the centre of Portugal, in the Santarém District. It covers a total area of 746km<sup>2</sup>, and is considered to be a low density, rural region with a population of 11 313 inhabitants. Seventeen parishes are contained within Chamusca. Within Chamusca, two regions can be distinguished due to their soils and water courses: Campo, at an altitude between 15 to 25m; and Charneca at 100 to 190m in altitude. Campo is the one region that seldom suffers from forest fire risks, unlike Charneca, which experienced the largest encroachment of forest fires in all of Portugal in 2003.

The main activities in Chamusca are based around agro-forestry, forestry and agriculture. The land use in 1999 was recorded and partitioned into 62% production forest, 35% cork and Holm oak forests, and 3% protection forest. Stands mainly consist of pure Eucalyptus, pure Maritime pine, mixed Maritime pine, pure cork oak and mixed cork oak stands. The impact on forest management has been significant as a result of the extreme weather conditions during the summer months, with high temperatures and very low precipitation levels. Consequently, the drivers for change in forest management have largely been influenced by:

- climate change, namely drought;
- forest fires, related to drought;
- Pine nematode and Eucalyptus pests;
- forest policy, influenced by EU subsidies; and
- increased use of biomass for energy.

## 2.2 Stakeholders

For the case of Chamusca, all forestry-related stakeholders were approached. In total, 13 organisations were used for the consultation exercise, of which eight operated at a regional level and five worked at a national level (see Table 1). Stakeholders were selected due to the broad range of focus and expertise. This includes all public (central and local) administration stakeholders, and representatives of other stakeholder types. The selection of representatives was made by ACHAR, the local project sponsor. This selection was considered in cases where the number of stakeholders was too large (e.g. forest owners) and based on ACHAR's experience, there was no substantial difference in the forest owners' decision making process (i.e. same property area, same management objectives, etc...). The invitation for stakeholders to participate was made personally at the kick off meeting or by phone. ACHAR was responsible for the contacts with most local stakeholders.

**Table 1. Stakeholders consulted for the forest management of Chamusca**

Regional		National	
Name	Role	Name	Role
ACHAR	Forestry association	WWF	NGO
BETA	Forestry contractor	Forum	Forestry federations
Private land owner Large scale (> 500ha)	Forest owner	UNAC	Forestry federations
Private land owner Small scale	Forest owner	Silvicaima	Industry- Central forestry administration
Chamusca	Municipal council	Portucel-Soporcel Group	Industry
Chouto	Municipal council	AFN	National Forest Authority
Civil protection	Municipal council of Chamusca		
GTF	Municipal council of Chamusca		

During the period of work under COST STSM-FP0804 – 4958, the focus was put on the data collection of the following three stakeholders: Silvicaima, ACHAR, and GTF.

### 2.2.1 Silvicaima

Silvicaima – the Forestry Society Caima (also referred to as Silvicaima) is one of the leading companies operating in the forestry sector in Portugal, dedicated in particular to the production of eucalyptus logs for pulp.

Silvicaima is currently certified by ISO 9001:2000 and Forest Stewardship Council (FSC). To achieve the objectives identified in its Forest Policy, forest management focuses on the following strategic areas:

- profitability of their business for economic sustainability;
- capacity building between forest production and customers' needs;
- biodiversity conservation and fire risk management;
- communication with stakeholders; and
- rural development, safety and social responsibility.

### **2.2.2 ACHAR**

ACHAR – *Associação de Agricultores de Charneca* (Farmers' Association of Charneca), currently covers a total area of 4 535ha, on which harvesting of both timber and non-timber forest products including coniferous and non-coniferous wood, nuts, and natural cork. ACHAR consists in seven associate members, including three private land owners, four agricultural societies.

ACHAR is currently certified by the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC). The main activities of ACHAR as stated in their mission statement include:

- protection from forest fires;
- promoting species of rapid growth;
- property management;
- inventory of resources;
- monitoring and treatment of disease and pests;
- biophysical planning;
- management planning; and
- protection of oaks and pines.

### **2.2.3 GTF**

GTF – Gabinete Técnico Florestal (The Technical Forestry Cabinet) and the Municipality of Chamusca signed a Collaboration Agreement with the Direcção-Geral dos Recursos Florestais (Directorate General of Forestry), so that the GTF could operate in Chamusca. The aim of this partnership was to promote sustainable development of natural resources and their environments, ensuring their protection, conservation and management. The main tasks of the GTF office in Chamusca are to: (i) develop, implement, and update the Inter-Municipal Plan for the Defence Against Forest Fires and their associated programs and plans; and (ii) participate in the access to training of civil protection. The following projects relating to forest fire management were managed and administered at the Chamusca office of the GTF in 2008:

1. Appreciation and awareness of forest fires for school children;
2. Inter- Municipal Operating Plan (POIM) for the management of forest fires;
3. Procedures for the information security, prevention and protection of forest fires;
4. Specialised information for protection and management of fires in Chamusca;
5. Helplines and other emergency services

## **2.3 Enterprise Architecture**

The consultation exercise focuses on the processes and business information required to support the forestry activities in the locality of Chamusca. The main objective of the stakeholder consultation is to gain an understanding of the structure of the organisations and the business methods employed, to organise and to assist the current phases of the decision-making process. More specifically, the aim is to collect and document on the following:

- the position and role of the organisation;
- the operation processes and the necessary resources;
- the communication processes;
- the information management, with databases and information systems;
- the technological infrastructure of the business such as computers, operating systems; and
- the networking infrastructure within the enterprise and with third parties.

The components stated above should allow us to see how stakeholders diagnose the actual issues at hand. The data collected from consultation will provide the needed input to identify the main information gaps, the technological strategies or tools, which may help each particular organisation, improve their management goals, management conditions. This is to say, with the analysis of the results from consultation we are looking to create ideas for strategic intervention through the development of decision support systems.

The findings of the stakeholder consultation are to be incorporated into decision models to help reflect as accurate as possible the situation in the forest. To achieve this, data collection was based on the “Enterprise Architecture” (EA). The EA framework is a tool used to describe and document the structure of an enterprise. It is composed of various interrelated components for describing the logical organisation of business strategies, business capabilities, current processes, information resources, business systems and communication infrastructure within the enterprise.

The use and application of the EA framework has been applied to a variety of needs. Typical applications are those for business strategic development, gap analysis when developing new business propositions, technological asset management, and programme management (EASArchitectureFramework, undated). However, for the forest sector the EA is an innovative approach to information processing (Marques et al., 2009), as it has only previously employed by federal agencies for capital planning and investment control, and to emerging technologies in IT. Forest management strategies could benefit from the EA models in their approach for ensuring that decisions are based on what the businesses involved need in the long term (strategic) as well as in the short term (tactical) (EASArchitectureFramework, undated).

The EA looks at the structure of the organisation and the structure of their decision making process, and the procedures they are undertaking; thus, enabling a comparison between local, regional, and nationwide forest planning. They create a basic analysis technique using a stakeholder influence diagram (Bryson, 2004), followed by a business plan with diagram stating the level of involvement, and metadata files providing descriptions of the management procedure, decision methods, and activities. A flowchart of the stakeholder’s plan is drawn, describing the information inputs and outputs in order to proceed with a forest management plan. Finally, a summary is drawn from the results gathered from every stakeholder. This provides the outline of the level of decision making, the current situation, and the provision for the future.

The results from the consultation exercise will help identify any information gaps, lack of awareness to the availability of tools, which may help improve the organisation's efficiency. Therefore, the goals of the stakeholder consultation and analysis of results will be to formulate problems, satisfy stakeholders by highlighting fundamental (actions or decision plans) alternatives to their current approach to forest planning through the dissemination of information and tools.

The following is a brief description of the components of the EA used to define the implementation methodology of the stakeholder consultation. These are used as a guideline for how the data is represented.

### **2.3.1 Business Architecture**

The aims of this step are twofold. The first is to collect and document the relevant information to further the understanding and describe of the current state of organisations, with regards to the following aspects: organisation, processes, information, systems, resources, technology. The second aim is to document and identify the problems and opportunities for improving conditions for the stakeholders.

The recommended steps are:

1. develop a diagram of the current context;
2. produce a questionnaire on the actual processes;
3. produce a questionnaire on the actual systems and information resources; and
4. analyse the current situation in order to identify problems and opportunities for improvement.

The main results will consist in:

- the documentation of the current situation, in terms of organisation, processes, information, systems, resources, and technology.

### **2.3.2 Architecture of Processes**

The aim of this step is to put forward structural processes for business and maintenance operations, for monitoring, and support structures. This should be done with sufficient amount of detail to characterise and represent them with accuracy.

The recommended steps are:

1. design and characterise the business processes, and the monitoring and support structures at various levels of detail;
2. develop a dictionary of activities, which describes the activities represented in the process diagram;
3. develop a dictionary of information sources, describing the key attributes, and identify where these are being used; and
4. analyse the results of the Architecture of Processes in order to draw some conclusions and recommendations, which will improve the overall delivery of the procedure.

The main results will consist in:

- a Business Model;
- the future Architecture of Processes: description and representation of support and business processes;
- a dictionary of information sources; and
- a dictionary of activities.

### **2.3.3 Information Architecture**

The aim of this step is to clarify and structure the information for achieving the organisation's processes, and to implement and manage the organisation's strategy.

The recommended steps are:

1. identify and define the Information Entities, based on the information collected in the previous phase;
2. characterise the Information Entities, paying particular attention to: the name and ID number; aims; agents who take care of the entities; mechanisms used for identification and their main attributes; their description; and the business processes that interact with the entities;
3. identify the types of relationships between entities that are considered relevant;
4. elaborate a CRUD matrix (Create, Read, Update, Delete), which summarises the business processes, the activities of their associate members, and the way information is handled; and



5. analyse the results of the Information Architecture in order to draw the conclusions and recommendations, which will improve the quality of the information.

The main results will consist in:

- Architecture of Information: a diagram of interaction of the informed entities; and
- Detail of the Information Entities.

#### **2.3.4 Architecture of Applications**

The aims of this step are twofold. The first is to identify and describe the systems

The recommended steps are:

6. prepare the overall Information System (IS). This should be based on the CRUD matrix, and on the engineering systems that have designed the main components of the IS, which are the functional subsystems, some of which are subdivided into the applications;
7. provide a detailed definition of each component of the subsystems and their modules;
8. analyse the result of the Architecture of Applications in order to highlight the key requirements for sharing and integrating information that will support the processes; and
9. define the requirements of the subsystems and the module applications, which are based on the needs of interaction and integration.

The main results will consist in:

- a general diagram of the system; and
- the system requirements.

#### **2.3.4 Technology Architecture**

The aim of this step is to identify the technology that is the most adept for supporting the existing applications and proposals for the Organisation, in such a way of minimising their operation costs and enhance the development and implementation of the recommended strategy.

The recommended steps are:

1. prepare the technological model recommended for the implementation of the application components;

2. prepare a detailed description of the technology platforms to support the infrastructure and the application components of the Information System; and
3. analyse the results of the Technology Architecture, in order to highlight the key technological requirements of the proposed solution.

The main result will consist in:

- Technology Architecture.

#### **2.4 Implementation of the Enterprise Architecture for the Chamusca case**

The protocol for the Enterprise Architecture (EA) was adapted to comply with the MOTIVE research objectives for the Chamusca case. The main objective of this investigation was to adopt the best approach for understanding the levels of forest management decision being used by stakeholders. Based on prior consultation experiences, the EA was seen as an innovative and appropriate tool to fulfil the needs of the investigation. Using the general guidelines for an EA, as stated in section 2.3, the consultation was adapted to suit the needs of the stakeholders in Chamusca (see section 3 for the methodology). The key aspect for the success of this investigation was to create empathy with the stakeholder, and ensure that they were not being judged for their choice of actions and decisions.

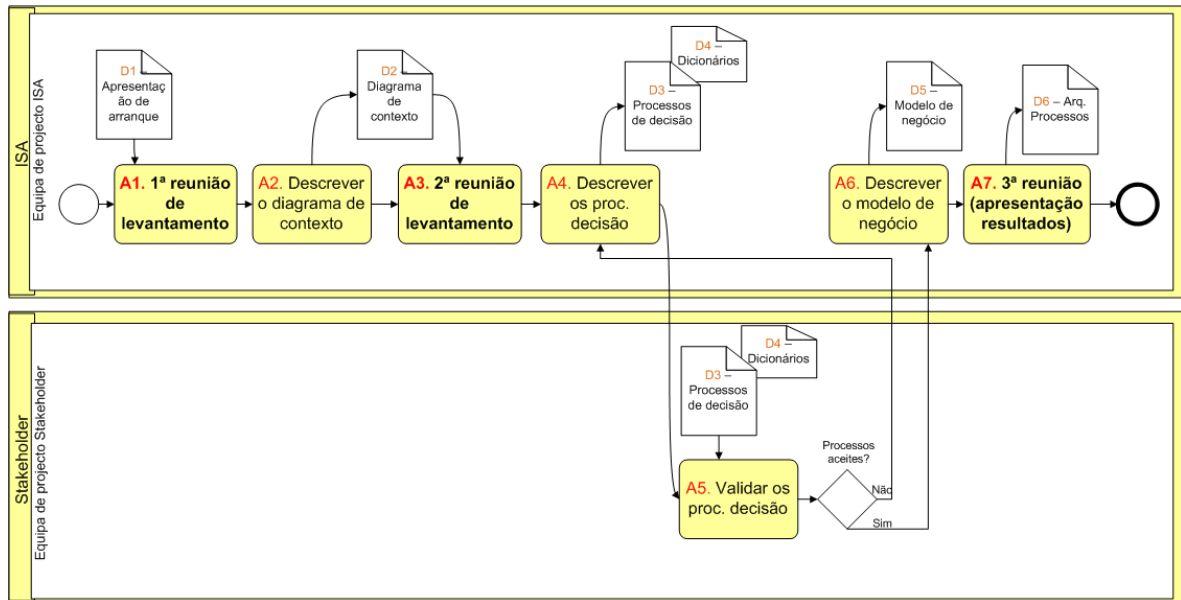
### **3. Methodology**

The research was conducted through a series of open discussions with each organisation. Gathering of stakeholders in an open discussion is more likely to produce higher-quality information and results (Baran and Jantunen 2004). Face-to-face consultation also brings participants to develop effective work relationships and trust.

Every organisation involved in the project is treated independently. A series of meetings are needed for each stakeholder organisation in order to comply with the EA framework, see Figure 1. At the start of every meeting, the framework of the business model is presented by the project team. All information collected will be recorded on data sheets, such as suggested by the EA approach. These data sheets are then validated by the respective stakeholders. No assumptions were made on the decision method of stakeholders.

Prior to starting the full consultation process, a kick-off meeting was held with ACHAR and all the stakeholders, at which occasion a presentation was given to outline the purpose of the

investigation as well as the methodology was given. In the case that stakeholders were not present at the kick-off meeting, this presentation was briefly summarised at the start of the consultation meeting. Aside from the presentation, no further background documentation was provided to the stakeholders.



**Figure 1. Methodology of the consultation process**

The EA consultation process, as shown in Figure 1, has the following steps:

*Internal process - ISA team*

*External process - stakeholder project team*

A1. 1<sup>st</sup> reunion on survey

A5. Validate the decision

D1. Start up presentation

D3. Decision process

A2. Describe the context diagram

D4. Dictionaries

D2. Context diagram

A3. 2<sup>nd</sup> reunion on survey

A4. Description of decision process

D3. Decision processes

D4. Dictionaries

A6. Description of the business model

A7. 3<sup>rd</sup> reunion on survey (presentation of results)

D6. Process Architecture

### 3.1. Stakeholder context diagram

After an initial meeting to concur the methodology of the application of the Enterprise Architecture structure for the stakeholder consultation, the survey process proceeds with the design of the context diagram. Such a representation allows us to identify the various stakeholders (internal and external to the organisation) involved in the business processes and information exchanged between the organisation and third parties. All influential agents must be properly registered in a profile dictionary. The information flows are described in a table and indicate the information sources used in their business processes. It is from this representation that the business model and their processes are recorded.

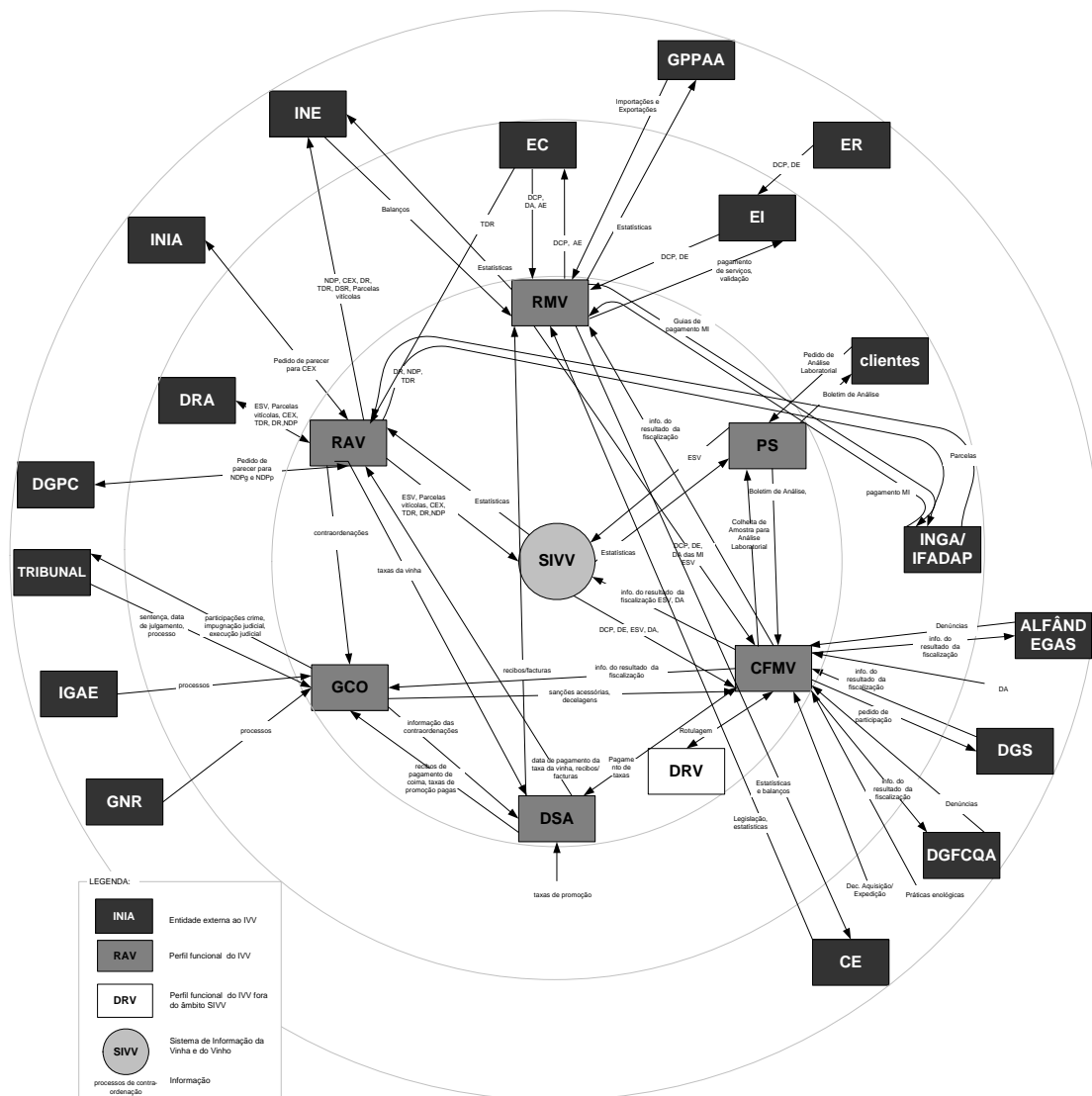


Figure 2. Example of the stakeholder context diagram

### 3.2 Business process

The business process, or decision process, takes into account the set of interrelated activities that transform inputs into outputs. It provides a comprehensive and integrated view of all processes and information flows with third parties. All processes have to be carefully explained and detailed in the following forms, as well as have a flowchart indicating how all the processes are connected. One form is filled out per process. The processes are characterised according to their function. :

- Business Process: a process (e.g. client management);
- Control Process: a set of activities performed to control the business processes (e.g. financial control of sales); and
- Support process: set of activities running across the organisation, ensuring its proper functioning (e.g. maintenance of the computer systems).

<id>. <Name of process>

Identification of Process	
ID_process	<identification of the process sequence, with the prefix "P" (same as the title) >
Category	< select type: business, control or support >
Name	< Appoint a name to process (same as the title)>
Objectives	< Main objective(s) of the process/ activity >
Location	< Location of process >
Frequency	< Frequency of the process: daily, weekly, monthly, annually >
Current process?	< Yes or no (future process) >

Responsibility	
Responsible	< Name of the responsible agent of the process (current name in the dictionary description of profiles and location) >
Mediating agent	< Naming all stakeholders involved in the process (current name in the dictionary description of profiles and location) >

Description of Process	
Description	< A paragraph describing the main activities performed in the process. This paragraph can also describe the objectives of the process and the potential for success >

List of activities	< List the activities represented in the flow chart of the process >
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Information sources of input and output processes	
Input information	< Identification of the relevant principles for the implementation of processes. Provide an ID and an appropriate name and a dictionary of information source >
Output information	< Identification of the key data for the implementation of processes. Provide an ID and an appropriate name and a dictionary of information source >
Flow chart of the process	

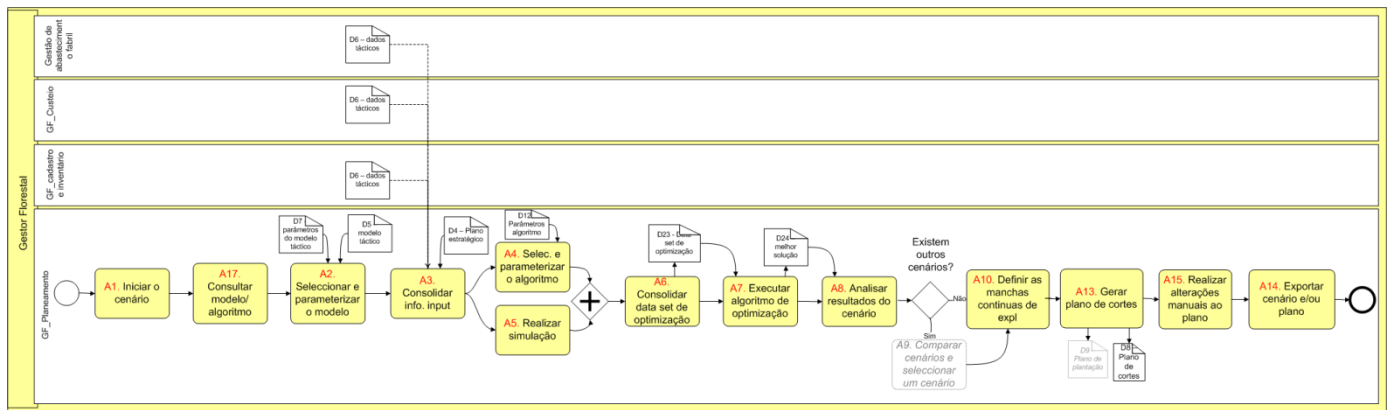


Figure 3. Example of a Business Process Negotiation Model flow chart of a business process

### 3.3 Business model

The business model is the first level of representation of the business processes. It provides a comprehensive and integrated view of all business processes, the support received by the organisation, and the information flows for the processes with third parties.

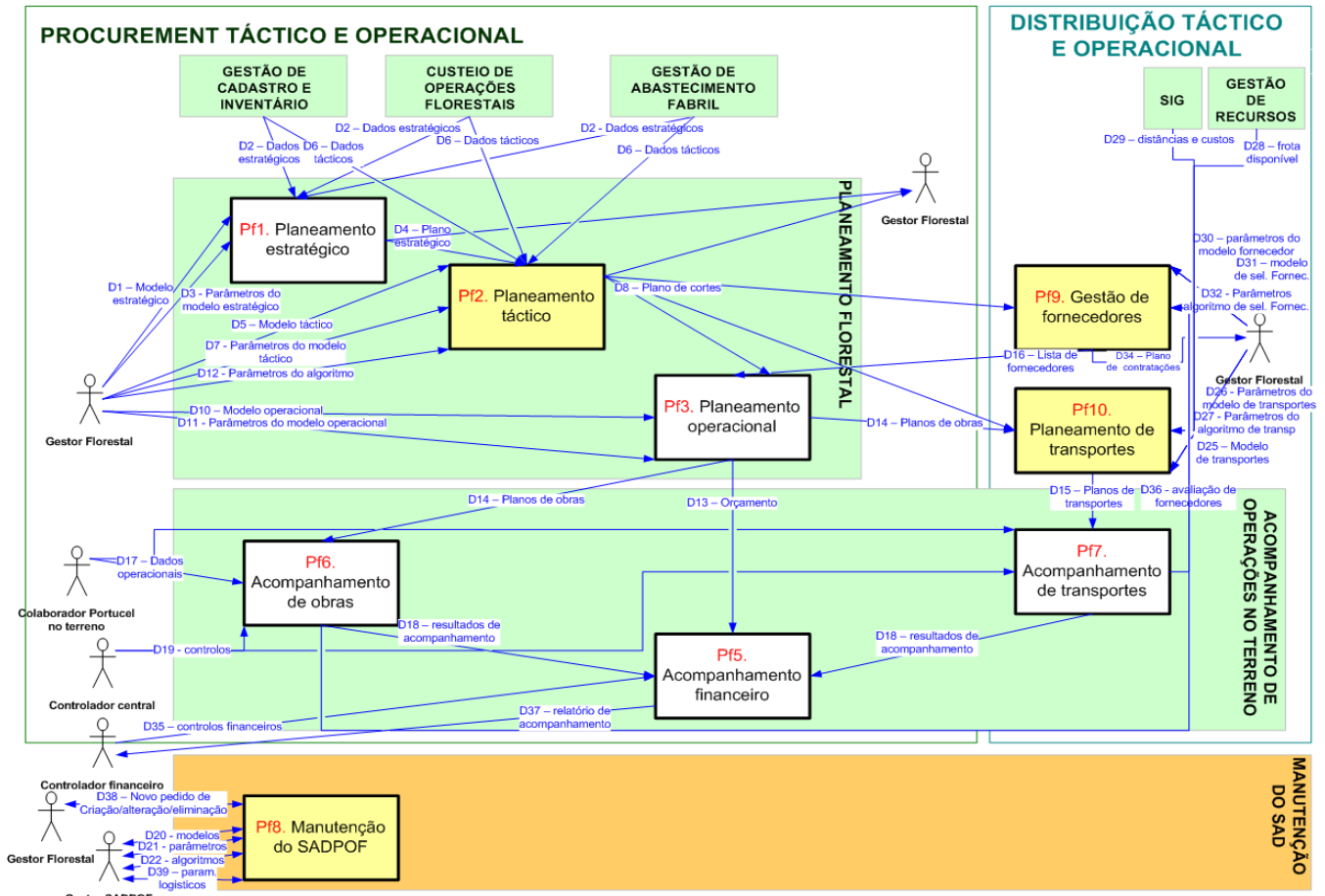


Figure 4. Example of the business model

### 3.4 Description of processes – dictionaries

#### 3.4.1 Dictionary of profiles

ID_profile	Typology	Name	Membership Organisation	Area of intervention	Description
Pe_xx	<Internal or external organisation of study>	<Name of profile>	<Name of organisation that they belongs to>	<Area of intervention of the profile >	<Brief description of the profile functions>

#### 3.4.2 Dicionary of activities

ID_activ	Name	Description	Observations	ID_proc
Axx	<Name of activity>	<Brief description of activity>		<Process(es) where it occurs>

ID_activ	Name	Description	Observations	ID_proc



**3.4.3 Dictionary of information sources and table of description of the flow of information**

ID_source	Name	Description	Typology	ID_proc	Obs.
Dxx (source)	<Name of the source/flow of information>	<Brief description of the source/flow of information. Can include its main field of application/attributes>	<Access to the information: paper document; phone call; fax; electronic format document; consultation; information system; email; other>	<ID of process(es) where the intervention takes place: "Pf1_I" input, "Pf2_O" output)>	<Can indicate the flow of information that it is associated to>






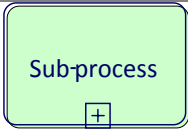
**3.5. Organisation of definitions**

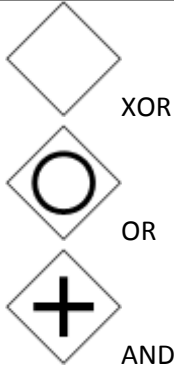

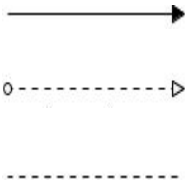
A representation of business processes following the notation standards of the BPMN (Business Process Modelling Notation) is given in Table 2.

**Table 2. Description of the Business Process Modelling Notation**

Concept	Description	Notation	Properties
Profile	Body involved in the business processes of the organisation. It is used in the business model, and in lanes of the BPMN flow.	 Profile	<ul style="list-style-type: none"> <li>• ID-profile</li> <li>• Name</li> <li>• Organisation it belongs to</li> <li>• Intervention premises</li> <li>• Description</li> </ul>
Process	Set of interrelated activities and inter acting that transform inputs into outputs (NP EN ISO 9000:2000) These are represented in the business model and detailed in the flowcharts of BPMN.	 Process	<ul style="list-style-type: none"> <li>• ID_process</li> <li>• Category: business or support</li> <li>• Name</li> <li>• Objectives</li> <li>• Premises</li> <li>• Frequency of occurrence, daily, weekly, monthly, annual</li> </ul>



Concept	Description	Notation	Properties
			<ul style="list-style-type: none"> <li>• Current process? Y / N</li> <li>• Responsible agent (a profile)</li> <li>• Mediating agent (one or more profiles)</li> <li>• Description</li> <li>• Information input</li> <li>• Information output</li> </ul>
Information flow	Analogue or digital information that flows between processes, and / or with the third parties. It is represented in the business model. A detailed description is given in the processes sources.		(Same as the information source)
Pool (premises)	This typically represents an organisation, but to facilitate the layout it is used to represent a department or an organisational unit.		N/A
Lane (profile)	Usually represents a department within an organisation. In the context of this document represents a function within a department (see Pool)		N/A
Event	Event is something that "happens" during the execution of a business process. There are several types of events. The most important are: <ul style="list-style-type: none"> <li>• Start of event: starts the process flow;</li> <li>• Intermediate event: in the context of this document, it indicates the intermediate link between two parts of the same flow; and</li> <li>• End of process</li> </ul>		N/A
Activity	Activity or task of the process. Joint actions between working in the field of a process. It may be an automatic procedure (performed by on the information system without human intervention) or other (need for human action, such as taking a decision)		<ul style="list-style-type: none"> <li>• ID_activity</li> <li>• Name</li> <li>• Description</li> <li>• Observations</li> <li>• Process(es) it belongs to</li> </ul>
Sub-process	Identifies a sub-process that somehow abstracts the complexity inherent in the sub-		(Same as the process)

Concept	Description	Notation	Properties
	process. This will also be described.		
Decision (gateway)	<p>Decision process. It represents a decision to be made by the system, may be the result of data entered in the proceeding. You will usually 2 or more outputs in terms of flow. There are several types of decisions:</p> <ul style="list-style-type: none"> <li>• Exclusive decisions: The conditions are evaluated in a given order and when it finds a true the others are ignored;</li> <li>• Inclusive decisions: as a convergent, this Gateway will wait for the processes running in parallel are synchronized to proceed with the flow;</li> <li>• Parallel decisions: These elements are used to create parallel flows or fully synchronize streams that are in parallel.</li> </ul>	 <p>XOR</p> <p>OR</p> <p>AND</p>	N/A
Source of information (data object)	<p>Dataset with similarities in type of input or output activities. This is typically a full document or part of a document. It provides the description of the information flow in BPMN.</p>		<ul style="list-style-type: none"> <li>• ID_source</li> <li>• Name</li> <li>• Description</li> <li>• ID_process</li> <li>• Observations</li> </ul>
Connectors	<p>Connectors establish the link between activities, with these events, decisions and information sources. There are 3 types of connectors:</p> <ul style="list-style-type: none"> <li>• Sequence: represents the order in which activities are performed</li> <li>• Message: message represents flows between processes.</li> <li>• Association: used to associate an artefact or text of an activity.</li> </ul>		N/A

Basic rules for modelling of the process design:

1. The name of the activities must begin with a verb in the infinitive (e.g. *Create* a scenario) and the processes with a noun (e.g. *Management Scenarios*);
2. An information source is any document or archive required to perform an activity (e.g. sheet description of the client; management plan);
3. The name of the activities should not refer to the information source (e.g. should confirm the client's name and not refer to client's index card);
4. All symbols have to remain unique, or those that are the same symbol, even if it appears in various representations; these should always have the same content. Consequently, all symbols used in the diagrams should be previously defined in a dictionary. When using the tool, copy the definition of the object from dictionaries to the other diagrams;
5. All information flows represented in the context diagram must match the sources of information; and
6. The description of the processes should be initiated by the flow chart, which is built with the stakeholders. At a later stage, the flowchart is sent back to the stakeholders for them to revise and validate the processes. This flow chart should be thought of as a summary of the processes and an updated version of the dictionaries should be included alongside it.

## **4. Preliminary results**

In order to ensure that all information is collected from the stakeholder consultations, the following levels of forest management planning are required.

Please note, a glossary of the terms and acronyms employed are available in section 8 of this document.

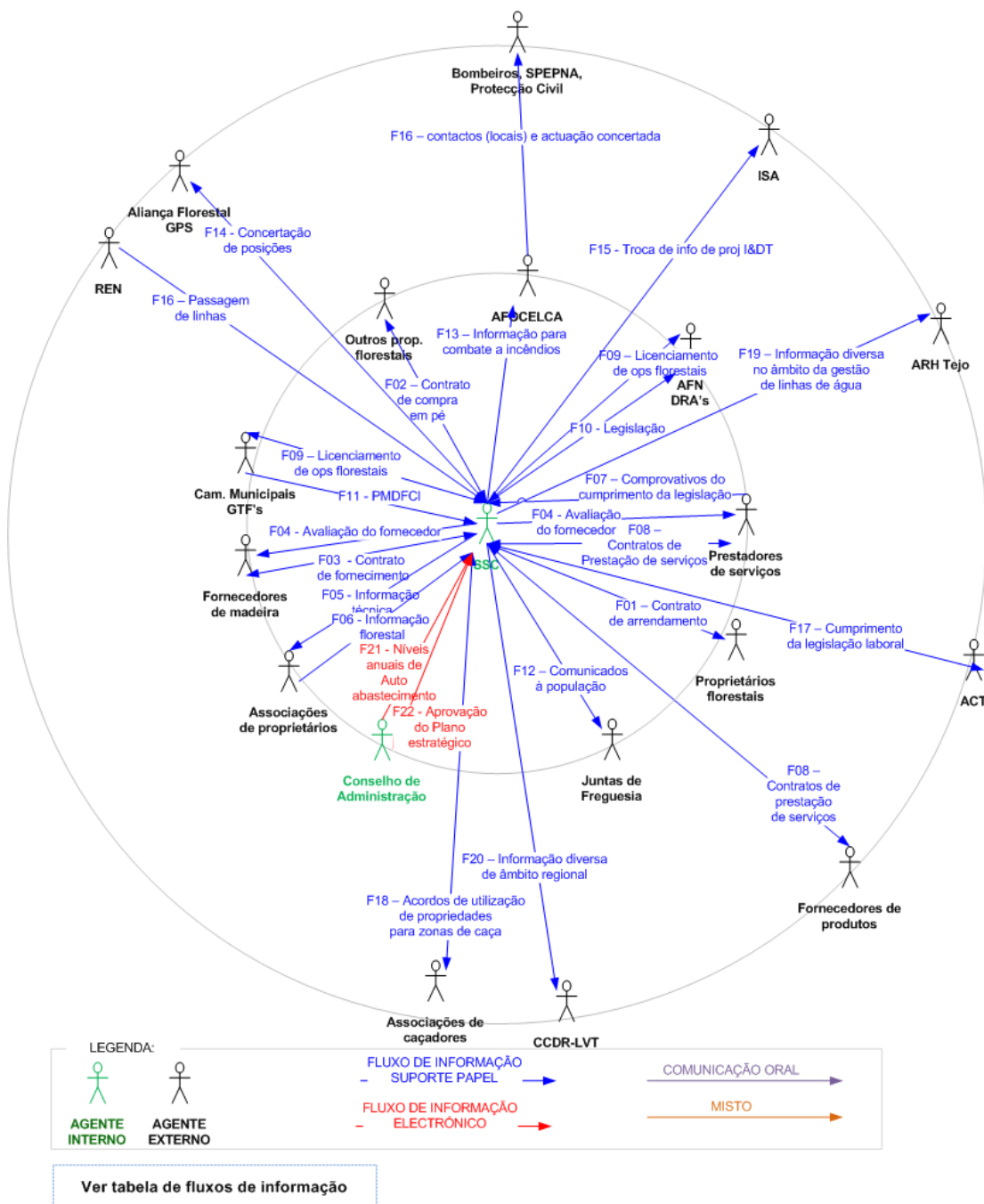
### **4.1 Silvicultura**

#### **4.1.1 Stakeholder Context diagram**

From the context diagram, Figure 5, we can conclude that there is directly or indirectly interaction with nearly all entities related to forestry. This is due to their influence over owners or managers of large forests, but also for its proactive stance in support of the forestry sector. They intervene on issues related to:

- legislation and forest certification;
- research and development; and
- forest fires.

They have the most frequent contact with forest services and regulatory authorities or local authorities in the forestry sector (for licensing issues). Interaction with forest owners and Afocelca has less immediate impact on their business management, but critical to the success of the company. To maintain good policy practices, they maintain contact with forestry associations and parish councils.



**Figure 5. Silvicaïma stakeholder context diagram****4.1.2. Business Process****Table 3. The business processes derived from the context diagram for Silvicaïma**

Name of process	Name of sub-process	Brief description
P1. Management of production		Sectors of the company responsible for manufacturing
P2. Supply of industrial wood	P2.1 Establish contact with wood suppliers	Obtaining a market for timber to meet the needs of the manufacturing sector that are not met by own production
	P2.2 Performance of wood suppliers	Evaluation of wood suppliers in the contract development
P5. Manufacturing		Control of the flow of raw material in the various manufacturing units
P3. Provision of services		Analysis of information from the audits performed for each of the service providers
P7 Property management	P7.1 Registration of forest areas	Description of forest land either owned or leased. This includes: maps, inventory data, management plans and the forest models to be used, historical costs of operations and their application.
	P7.2 Forest area inventory	Quantify and characterise the forest stands and collect information that allows the use of models to assess existence in future.
	P7.3 Forest certification	
	P7.4 Management of conservation area	
P4 Management of forestry operations	P4.1 Strategic plan	Growth models and economic enhancements made to generate scenarios of timber production in the long run, in accordance with a set of parameters, constraints and historical costs.
	P4.2 Operation plans	The operation plan for the coming year and its budget, which is based on the harvesting and plantations activities established in the strategic planning and part of the activities identified that are essential to the maintenance of properties.
	P4.3 Contracts awarded	The inputs refer to the operational level, which defines the level of zones and budgets for the various service providers, can be validated at a higher

Name of process	Name of sub-process	Brief description
		level.
	P4.4 Operational follow up	Following the delivery of an order, the service providers agree on the work, and training is given to workers. The activities are monitored, and surveys are carried out according to the existing procedures. The information will then be integrated into the evaluation of service providers.
	P4.5 Silvicultural activities of owners	Field visits to assess the state of forestry properties. The aims are to: identify forestry operations performed; assess the health and safety status, assess the risk of fire, and assess the maintenance of infrastructure (roads and fire breaks). Includes afforestation plans and maintenance plans.
P8 Increasing properties and standing timber		Increasing the number of properties for lease, typically for a period of 24 years, and increase the number of stands for harvesting by cutting takes (2/3 years).
P6 Administration management	P6.1 Control of payments to suppliers	Process support for the maintenance of the Silvicaima structure. Includes the sub-processes for charging of the services provided

#### 4.1.2.1 Business process - flow of information

In terms of the flow of information, as shown in Table 4, they need to maintain rigorous control of communication due to their activities related to certification. As a result, written communication is the most common (i.e. on paper). However, first contact can be done in a more informal manner, by email or oral communication.

**Table 4. Information flows within the Silvicaima**

ID_flow	Name	Description	ID_process	Obs.
F01	Contract for information exchange	Documentation of the information exchange with the aim of concluding a lease, usually for a 24 year period.	P8.	-
F02	Contract for purchasing standing timber	Documentation on the information exchange with the aim of concluding a contract for the purchase of standing timber, immediate or delayed harvesting.	P8.	-
F03	Supply contract	-	P2.1.	-
F04	Supplier assessment	Assessment of the supplier service provider	P2.2., P3.	-

ID_flow	Name	Description	ID_process	Obs.
		in the realisation of contracts.		
F05	Technical information	Technical information on the establishment of ZIFs: documentation of the basic description of properties (range, occupation, roads, etc...), silvicultural models, etc	-	-
F06	Forestry information	Forestry information sent to the associations and their associated members	-	-
F07	Evidence of compliance	Sent by the service providers as evidence for the compliance with social obligations and employment.	P3.	-
F08	Contracts for services	Exchange of information to establish the contracts for services other than those for afforestation and forest maintenance	P4.3.	-
F09	Licensing	Exchange of documentation in connection with applications of permits for forest operations, afforestation projects, exploration projects, etc...	P4.4	-
F10	Legislation	Participation in the analysis and discussion of legislation in the sector	-	-
F11	PMDFCI	Information exchange in planning and implementation of PMDFCI: location of properties, roads, water points, planned actions, etc...	-	-
F12	Communication with the public	Information provided by the Silvicaima to the population on various activities that may influence their daily lives: working operations, use of roads by heavy vehicles, etc...	P4.4	-
F13	Information for fighting fire	Sending relevant information for planning forest fire fighting, including mapping and fire risks	-	-
F14	Coordination of positions	-	-	-
F15	Exchange of information for project R&D	Exchange information on projects and applications for R&D in partnership with universities	-	-
F16	Crossing lines	Trading related to crossing lines of power transmissions between properties managed by Silvicaima	-	-
F16	Contacts (locals) and concerted action	Provision of contacts and actions related to fire fighting.	-	-
F17	Compliance with labour laws	Silvicaima sends compliance documents proving the legal obligations in relation to its employees	-	-
F18	User agreements for between the properties in the hunting zones	-	-	-
F19	Diverse information	-	-	-

ID_flow	Name	Description	ID_process	Obs.
	in the management of water lines			
F20	Diverse regional information	-	-	-
F21	Yearly levels of self-sufficiency	Annual volumes of wood from their own forests to supply the plant.	-	-
F22	Strategic plan approval	The strategic plan is the result of a strategic scenario optimized, which is approved by the Board.	-	-

-

#### 4.1.3 Description of processes – ID of processes

##### 4.1.3.1 Process P4.1. Strategic planning

Identification of Process	
Id_process	P4.1.
Category	<i>Business</i>
Name	Strategic planning
Objectives	Develop macro scenarios for relatively long periods (30 years)
Location	-
Frequency	Annually
Current process?	TRUE

Responsibility	
Responsible	Central Forestry Administration (Responsible for the strategic planning
Mediating Agents	Central Forestry Administration, Administration Council

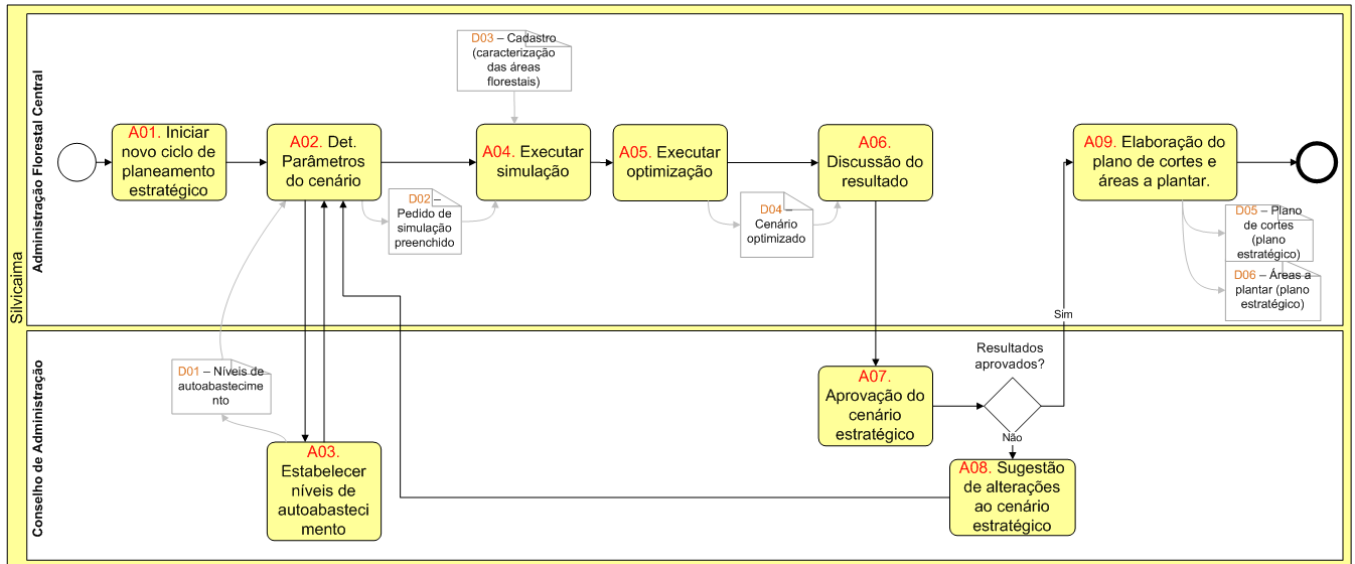
Description of Process	
Description	Growth models and economic enhancements are done according to a set of parameters, constraints, and historic costs, which generate scenarios for timber production in the long term, and are designed to meet the levels of self-sufficiency for the manufacturing Groups.
List of activities	A01, A02, A03, A04, A05, A06, A07, A08, A09

Information sources of input and output processes	
Input information	D01, D02, D03, D04



Output information	D05, D06
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Flow chart of the process



4.1.3.2 Process P4.2. Operational planning

Identification of Process	
Id_process	P4.2.
Category	Business
Name	Operational planning
Objectives	Development of an operational plan, exploration units and the budget for the following year, applied at a regional level
Location	Regions
Frequency	Annual
Current process?	TRUE

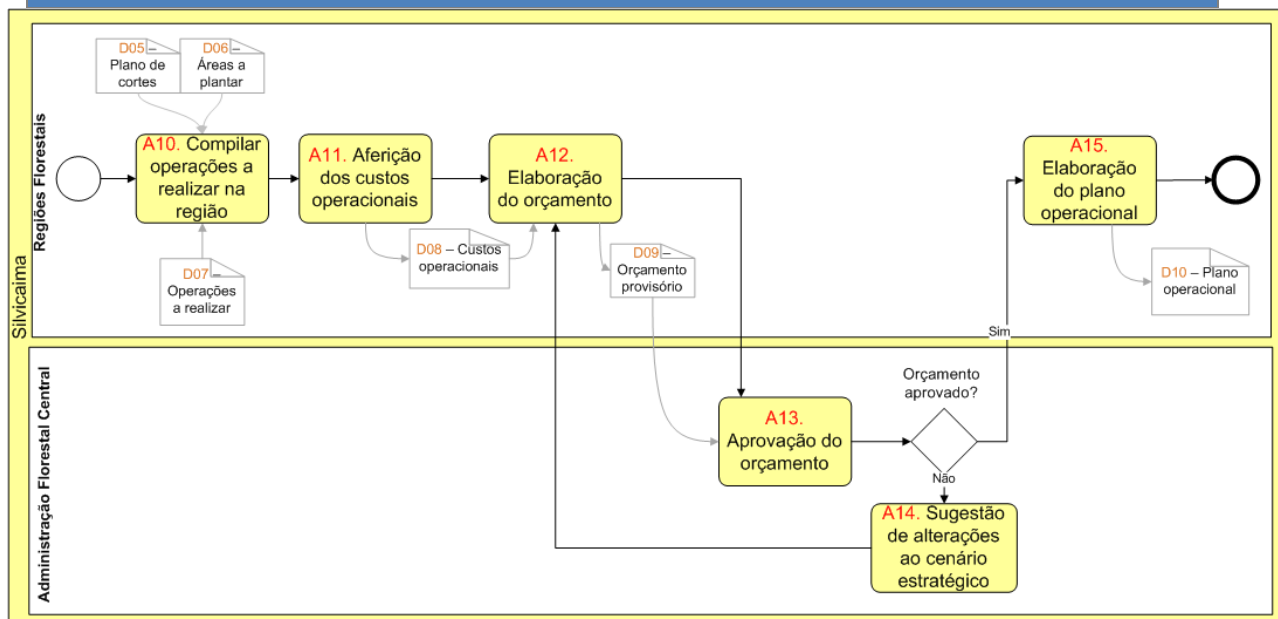
Responsibility	
Responsible	Forestry Regions (Heads of the region)
Mediating agents	Forestry Regions (Heads of the region), Central Forestry Administration

Description of Process	
Description	The operational plan and the budget for the coming year is based on the harvesting and plantations established during the strategic planning stage

	and in identifying activities that are essential to the maintenance of settlements.
List of activities	A10, A11, A12, A13, A14, A15

Information sources of input and output processes	
Input information	D05, D06, D07, D08, D09
Output information	D08, D09, D10

Flow chart of the process



4.1.3.3 Process P4.3. Contracts awarded

Identification of Process	
Id_process	P4.3.
Category	Business
Name	Contracts awarded
Objectives	Contracts with service providers that comply with the operational planning
Location	Silvicaima
Frequency	Annual
Current process?	TRUE

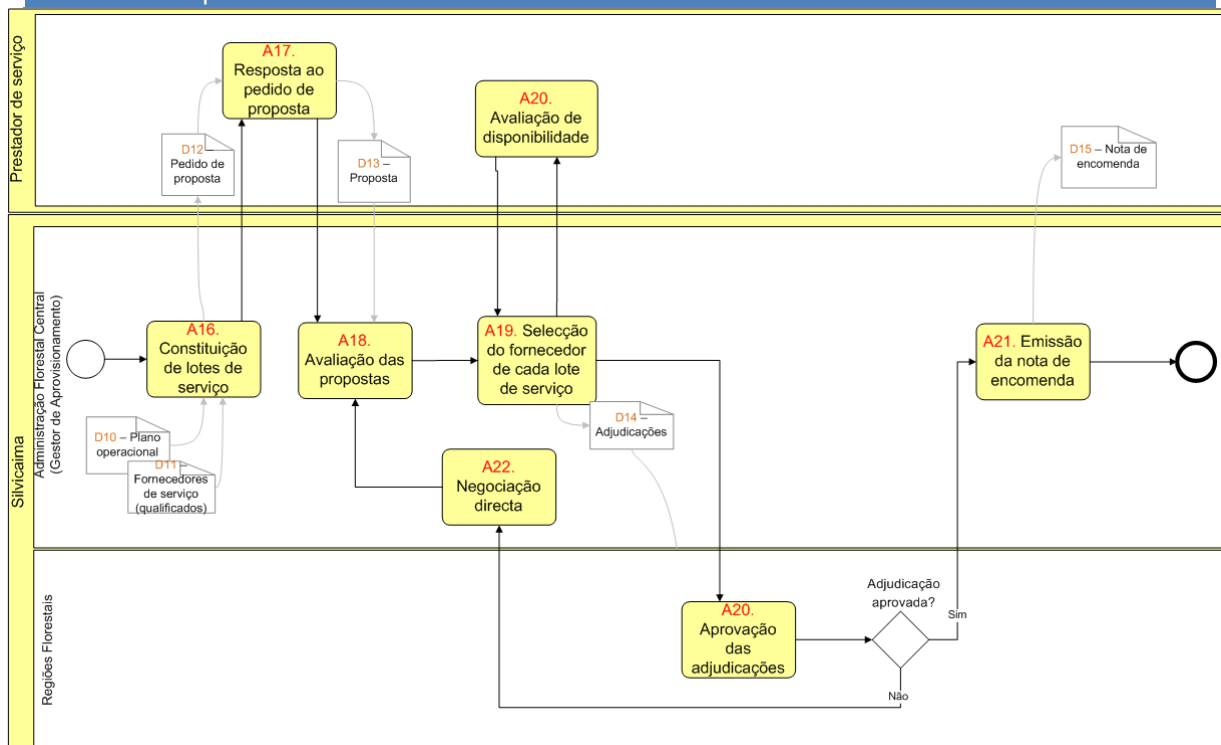
Responsibility

Responsible	Central Forestry Administration (Supply manager)
Mediating agent	Central Forestry Administration (Supply manager), Forestry Regions, Service provider

Description of Process	
Description	The inputs for the operational plan are: to set the areas of where the work should be carried out, and to establish budgets for the various service providers, which will then be validated at a higher level.
List of activities	A16, A17, A18, A20, A21, A22

Information sources of input and output processes	
Input information	D10, D11, D12, D13, D14
Output information	D12, D13, D14, D15

Flow chart of processes



4.1.3.4 Process P4.4. Operational plan

Identification of Process	
Id_process	P4.4.
Category	Business

Name	<i>Operational plan</i>
Objectives	To accompany operations that are realised on a yearly basis and evaluate the performance of service providers
Location	Properties
Frequency	Annually
Current process?	TRUE

#### Responsibility

Responsible	Forestry managers
Mediating agent	Forestry managers, service providers

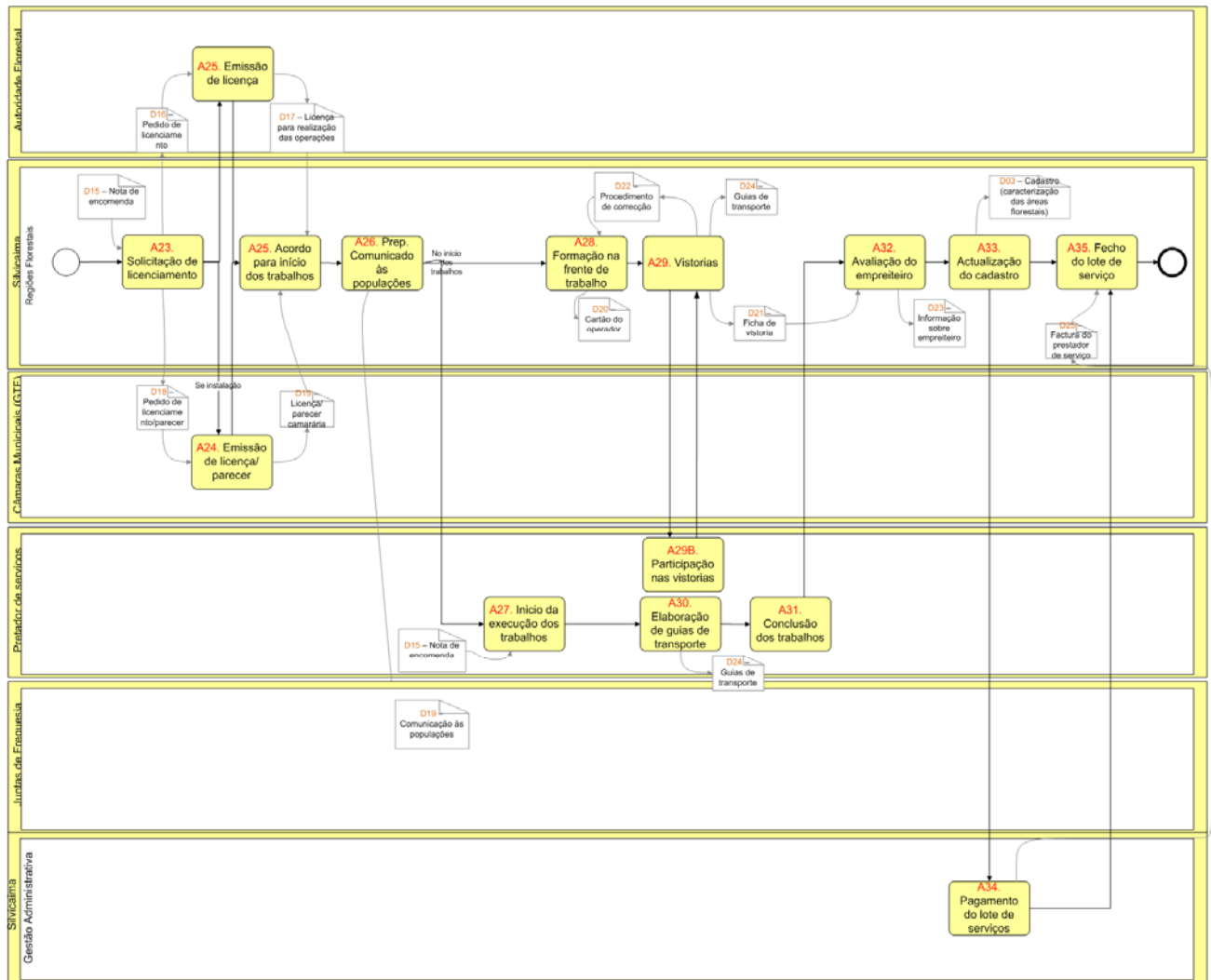
#### Description of Process

Description	After an order has been issued, the service providers are contacted to agree on the work, and to see whether any training can be provided to workers. Their activities are monitored, and surveys are carried out according to existing procedure. This information will be integrated into the evaluation of service providers.
List of activities	A23, A24, A25, A26, A27, A28, A29, A30, A31, A32, A33, A34, A35

#### Information sources of input and output processes

Input information	D03, D15, D16, D17, D18, D18B, D21, D22, D25
Output information	D16, D17, D18, D18B, D19, D20, D21, D22, D23, D24

#### Flowchart of processes



**4.1.3.5 Process P4.5. Silviculture of properties**

Identification of Process	
Id_process	P4.5.
Category	Business
Name	Silviculture of properties
Objectives	Field visits to assess the silvicultural state of the property. Aimed at: identifying silvicultural operations to perform; evaluate the health condition; evaluate the risk of fire; and maintenance of infrastructure (roads and firebreaks).
Location	Proprieties
Frequency	Occasionally
Current process?	TRUE

Responsibility

Responsible	Forestry managers
Mediating agent	Forestry managers, service providers

#### Description of Process

Description	Includes plans of afforestation and maintenance plans
List of activities	

#### Information sources of input and output processes

Input information	
Output information	

#### Flow chart of the process

N.B.: The flow chart of this process was not yet been established. Once drawn it will indicate where the decisions are made on the various options for the management of properties. In principle, the operations are defined in a previously established forestry model, the dates and the operations remaining are left to the discretion of the local property manager.

4.1.3 Business model

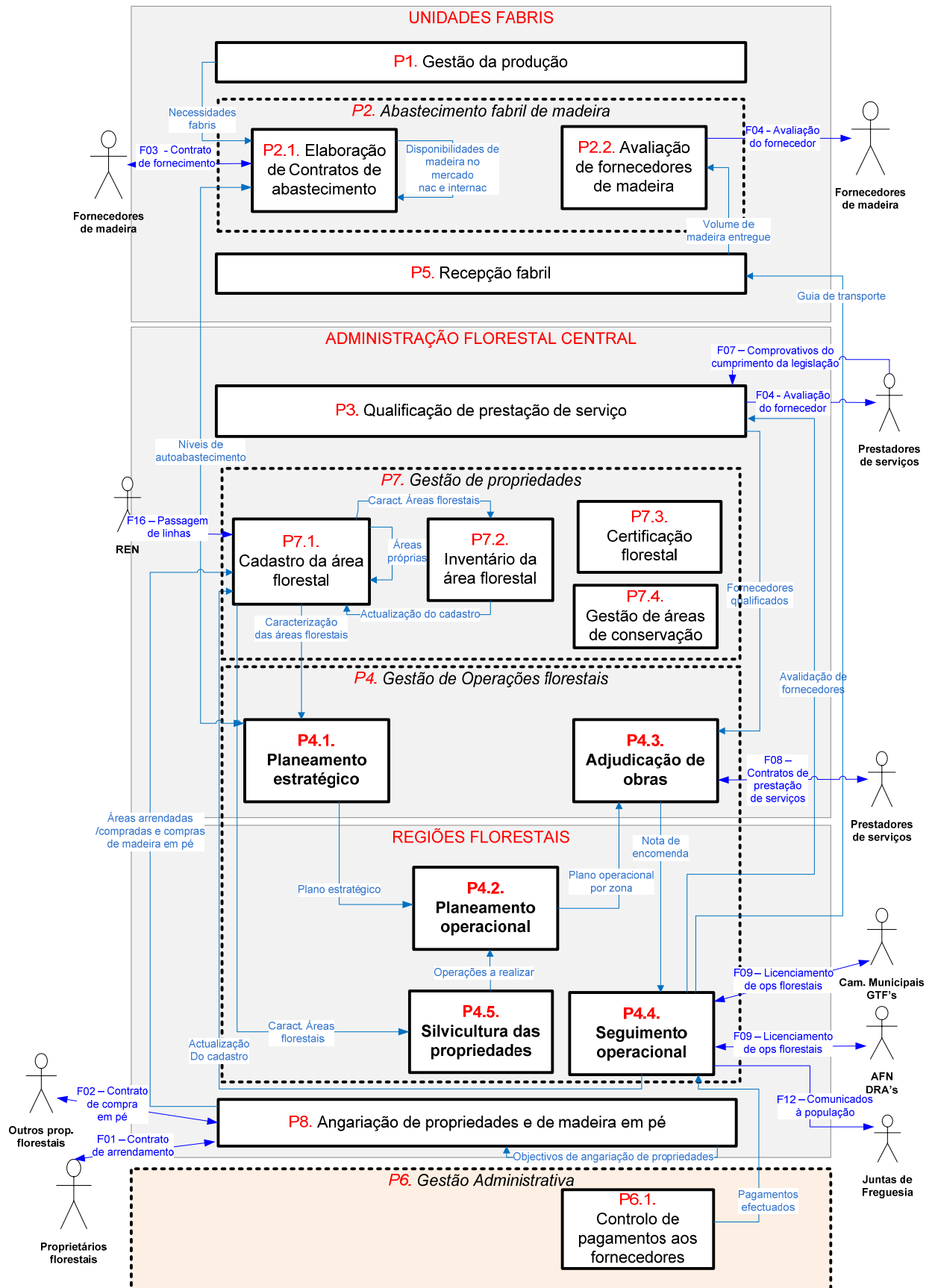


Figure 6. The business model for Silvicaima

**Table 5. A summary of the business model for Silvicaima**

Business processes	Interaction with other agents	Information flows
<p><i>Production units</i></p> <p>P1 Management of production</p> <p>P2 Supply of industrial wood</p> <p>P2.1 Establish contact with wood suppliers</p> <p>P2.2 Performance of wood suppliers</p> <p>P5 Manufacturing</p>	<p>Wood suppliers</p> <p>Transportation</p>	<p><i>Internal information flows:</i></p> <p>Manufacturing needs</p> <p>Availability of wood in national and international markets</p> <p>Volume of wood delivered</p> <p>Transport guide</p> <p><i>To and from external parties:</i></p> <p>F03. Manufacturing contract</p> <p>F04. Evaluation of manufacturer</p>
<p><i>Central forestry administration</i></p> <p>P3 Provision of services</p> <p>P7 Property management</p> <p>P7.1 Registration of forest areas</p> <p>P7.2 Forest area inventory</p> <p>P7.3 Forest certification</p> <p>P7.4 Conservation area management</p> <p>P4 Management of forestry operations</p> <p>P4.1 Strategic plan</p> <p>P4.3 Contracts awarded</p>	<p>Service providers</p> <p>REN</p>	<p><i>Internal information flows:</i></p> <ul style="list-style-type: none"> <li>- Evidence of compliance</li> <li>- Supplier appraisal</li> <li>- Levels of self-establishment</li> <li>- Description their forest areas</li> <li>- Registration of own forest areas</li> <li>- Updating the register</li> <li>- Finding qualified suppliers for the contracts awarded</li> <li>- Assessment of suppliers</li> </ul> <p><i>To and from external parties:</i></p> <ul style="list-style-type: none"> <li>- Contracts of service providers</li> </ul> <p>F16. Crossing lines</p> <p>F04. Evaluation of manufacturer</p> <p>F07. Evidence of compliance</p>
<p><i>Forestry regions</i></p> <p>P4.2 Operation plans</p> <p>P4.4 Operational follow up</p> <p>P4.5 Silvicultural activities of owners</p> <p>P8 Increasing properties and standing timber</p>	<p>Forest owners,</p> <p>DRA, AFN</p> <p>Parish councils,</p> <p>Service providers</p>	<p><i>Internal information flows:</i></p> <ul style="list-style-type: none"> <li>-Strategic plan</li> <li>-Operational plan for the area</li> <li>-Purchase Order</li> <li>-Operations to undertake</li> <li>-Description of forest areas</li> <li>-Updating the register</li> <li>-Objectives of acquiring properties</li> </ul> <p><i>To and from external parties:</i></p> <p>F09. Licensing of forest operations</p> <p>F08. Contract purchasing stands</p> <p>Lease</p> <p>F12. Communication with the public</p> <p>F02. Contract of purchase of stands</p> <p>F01. Property contract</p>
<p><i>Administration</i></p> <p>P6 Administration management</p> <p>P6.1 Control of payments to suppliers</p>		<p><i>Internal information flows:</i></p> <p>Payments made</p>



#### 4.1.5 Description of processes - dictionaries

##### 4.1.5.1 Dictionary of Profiles

ID_profile	Typology	Name	Membership Organisation	Area of intervention	Description
Pe_01	Internal	Silvicaima	-	Country level	Organisation responsible for the management of the forest heritage of the Altri group.
Pe_02	External	Forest owners	-	Their forest properties	Collective or individual forest properties
Pe_03	External	Other forest owners	-	Their forest properties	Collective or individual forest properties
Pe_04	External	Wood suppliers	N/A	Country level	Entities, individual or collectives, wood suppliers
Pe_05	External	Name of propriety owner	N/A	Country level	Association of those property owners responsible for the management of forestry areas
Pe_06	External	Service providers	-	Country level	Entities of forestry service provider, management and forestry research
Pe_07	External	AFN, DRA	Ministry of Agriculture	National Territory	Public organisations with expertise in forest management. The AFN regulates the forestry sector. The DRAs are regional organisations of the Ministry of Agriculture in the Region.
Pe_08	External	Local authority	-	-	Local authorities and in particular their GTFs.
Pe_09	External	Parish Councils	-	-	-
Pe_10	External	Afocelca	-	Country level	Company created by the producers of pulp for coordinating the fight against forest fires
Pe_11	External	National Grid	-	Country level	Entity responsible for the distribution of national electricity
Pe_12	External	Portucel Soporcel Group	-	-	Main industry of pulp paper and paperboard in Portugal
Pe_13	External	CCDR-LVT	-	-	-
Pe_14	External	Fire-fighters, SPEPNA, Civil Protection	Ministry of Internal Administration	National Territory	Public bodies involved in the management of forest fires protection

Pe_15	External	Authority for the working conditions	-	Country level	-
Pe_16	External	Hunting associations	N/A	Municipal level	-
Pe_17	External	Production suppliers	National		
Pe_18	External	ARH Tejo	-	-	-
Pe_19	External	Universities	-	-	Public and private bodies collaborating with Silvicaima in forest research

#### 4.1.5.2 Dictionary of Activities

ID_activ	Name	Description	Observations	ID_proc
A01.	Start new cycle of strategic planning	The end of each year begins with the creation of the strategic scenario for the next year, to determine the level of harvesting necessary to meet the levels of self-sufficient areas, and plan afforestation	-	P4.1
A02.	Determine the parameters of the scenario	Definition stage for the simulation, indicating the parameters to be used: period, interest rate, historical costs, age, minimum and maximum number of trees for planting area	-	P4.1
A03	Establish levels of self-establishment	Identify the annual volume of timber from the forests to be supplied to the plant	-	P4.1
A04.	Proceed with simulation	Depending on the scenario set, the simulation is done to optimise the financial result for the period specified	-	P4.1
A04.	Proceed with optimisation	Depending on the projections / requirements defined, the system performs an economic optimization	-	P4.1
A06.	Discussion of the results	Analysis of results and suggestions for improvements	-	P4.1
A07.	Proceed with simulation	Depending on the scenario set, the simulation is done to optimise the financial result for the period specified.	-	P4.1
A07.	Visit properties	Visit properties in September in order to identify the maintenance required and develop the operational plan of the following year and its budget.	Not necessarily all the properties, since it is visited several times a year.	P4.2.
A08.	Suggested amendments	Suggested corrections to be made to the initial scenario	-	P4.1

ID_activ	Name	Description	Observations	ID_proc
A09.	Establish which are the areas for harvesting and which are for planting	Development of the strategic plan, including its sub-components: plan of cuts and plan to plant areas	-	P4.1
A10.	Recording of operations in the region	Identify areas for harvesting and planting	-	P4.2.
A11.	Verification of the operational	Definition of operating costs for each operation and the specific situation of the region	-	P4.2.
A12.	Budgeting	Develop a first version of the operating budget, based on the identified operations, operating costs and activities defined by the strategic plan	-	P4.2.
A13.	Approval of the budget	Discussion on the proposed operating budget available and its approval	-	P4.2.
A14.	Suggested amendments	Suggested corrections to be made to the initial scenario	-	P4.1
A15.	Preparation of the operation	Preparation of the operational plan, setting out the operational units and their timing, in accordance with the approved budget	-	P4.2.
A16.	Establishment of service	Establishment of several groups of properties with similar types of operation, in order to simultaneously award them with the same service provider	-	P4.3.
A17.	Response to request	Proposal of cost, equipment and duration of work on the batch of proposed services.	-	P4.3.
A18.	Evaluation of Proposals	Evaluation of service providers in relation to the services requested. The assessment is based on the price and historical information on the evaluation of the service provider.	-	P4.3.
A19.	Selection of the supplier for every service	List from SIGO of the types of work and their attributes for each of the selected service providers	-	P4.3.
A20.	Average rating	Available if the service provider is able to perform more than just one job	-	P4.3.
A20.	Approval of procurement contracts	Approval of procurement contracts awarded for work which is intended in the operational	-	P4.3.
A21.	Issue of purchase order	Issue of the order being sent to the service provider and regions	-	P4.3.
A22.	Direct negotiation	Direct negotiation for the best price	-	P4.3.
A23.	Request license	Request authorization from the licensing of forest operations provided	-	P4.4.

ID_activ	Name	Description	Observations	ID_proc
A24.	Issue of permit/ license	Issue of opinion for eucalyptus plantations	-	P4.4.
A24B.	Issue of license	Issue of license for the agricultural or planting operations	-	P4.4.
A25.	Agreement for commencement of work	Contact the service provider to agree the start date of work	-	P4.4.
A26.	Preparation of public communication	Preparation of statement to the population on forest operations to achieve	-	P4.4.
A27.	Start of the work	Training given at the start of work, with the specifications of operations and legal and environmental aspects that the company is obliged	-	P4.4.
A28.	Training in front of job	Training given at the start of work, with the specifications of operations and legal and environmental aspects that the company is obliged	-	P4.4.
A29.	Surveys	Conducting surveys in accordance with procedure	-	P4.4.
A29B.	Participation in the surveys	Provide information on the ongoing work within surveys	-	P4.4.
A30.	Preparation of necessary transportation	Preparation of necessary transport and loading of goods at each operating unit	-	P4.4.
A31.	Completion of work	Completion of all work on the ground regarding the lot of service	-	P4.4.
A32.	Evaluation of the service provider	Assessment of the service provider based on the work done and records of survey	-	P4.4.
A33.	Updating the register	Update trading records in the property and the characterization of forest stand	-	P4.4.
A34.	Payments for services	-	-	P4.4.
A35.	Finished work of service providers	-	-	P4.4.

#### 4.1.5.3 Dictionary of Information sources

ID_source	Name	Description	Typology	ID_proc	Obs.
D01	Levels of self establishment	Annual volumes of wood to the mill, from the forests	-	P4.1._I, P2.1._O	Performed in the form of strategic planning
D02	Request for	Document filled with the	-	P4.1._I/O	-

ID_source	Name	Description	Typology	ID_proc	Obs.
	simulation	parameters and constraints for carrying out a simulation			
D03	Register (characterization of forest areas)	Information on the forest areas managed by Silvicultura data for population (forest inventory) and for the rent (rent, dates, etc.)	-	P4.1._I, P7.1._O; P4.4._I	-
D03	Register (characterization of forest areas)	Information on the forest areas managed by Silvicultura data for population (forest inventory) and for the rent (rent, dates, etc.)	-	P4.1._I, P7.1._O; P4.4._I	-
D04	Optimisation scenario	Results of the optimised scenario simulation and optimisation	-	P4.1._I/O	-
D05	Harvesting plan (Strategic Plan)	Stands due for harvesting, according to the approved strategic program	-	P4.1._O, P4.2._I	-
D06	Planting areas (Strategic Plan)	Total area to be planted annually, as new areas such as reforestation, according to the plan approved damage	-	P4.1._O, P4.2._I	-
D07	Operations to perform	Listing of planned maintenance for the following year	-	P4.2._I, P4.5._O	-
D08	Operating costs	Average cost of operations, adjusted for each zone and specific conditions.	-	P4.2._I/O	-
D09	Provisional budget	Budget prepared in accordance with the necessities identified by the regional and the operations defined at the strategic planning	-	P4.2._I/O	-
D10	Operational plan of the region	Final operational plan, detailing the operations to perform monthly and annual budget approved for the region.	-	P4.2._O, P4.3._I	-
D11	Service Providers	Listing of service providers	-	P4.3._I; P3._O	-
D12	Request for proposal	Request for Proposal for service providers to implement lots of forest services (operation, installation)	-	P4.3._I/O	A template exists for this request
D14	Proposal	Proposals submitted by service providers with prices per transaction	-	P4.3._I/O	-
D15	Purchase	Note to award a lot of	-	P4.3._O,	-

ID_source	Name	Description	Typology	ID_proc	Obs.
	Order	services from a supplier		P4.4._I	
D16	Permit applications	Form provided to the operator to assist the service provider Silvicaima	-	P4.4._O	-
D17	License for the transactions	-	-	P4.4._I	
D18	Permit applications	Form provided to the operator to assist the service provider Silvicaima	-	P4.4._O	-
D18B	License / opinion city council for the installation of stands	-	-	P4.4._I	-
D19	Communication with the public	communication of the work involved and the possible nuisance to the public	-	P4.4.	-
D20	Form of the operator	Form provided to the operator, which assists the service provider as the Silvicaima	-	P4.4._O	-
D21	Survey form	Survey form to record the compliance or not, detected on the day of work	-	P4.4._I/O	Registration made directly to an electronic book
D22	Recommended amendments	Procedures be adopted to correct the nonconformities	-	P4.4._I/O	-
D23	Information on service provider	Results and analysis of a survey carried out to if there is any non-compliance	-	P4.4._O/ P3_I	This information will contribute to the classification process of service providers.
D24	Transport guides	Transportation guides for timber	-	P4.4._O; P5_I	-
D25	Invoice to the service provider	Invoice service provider of the service provider on the lot of services running	-	P4.4._O; P5_I	-

#### 4.1.6 Preliminary summary of results for Silvicaima

The following are some of the preliminary summary from the consultation process with Silvicaima:

- they use a strategic forestry plan as a source for optimisation tools, in order to help identify cutting age;
- information on management is produced for internal use and for historical records, for example, keeping records of costs;
- an operational plan is drafted for their zones of forestry activity after the first year of the strategic plan, and includes the processes and the best practices commonly used throughout the whole company; and
- all decisions for conducting forestry operations were done once a field visit was performed and according to the budget available in each region. The silvicultural model is only proposal.

Some possible suggestions of information and tools which could be useful to Silvicaima:

- management system for the historical costs and previous operational costs;
- optimisation of forestry logistics; and
- clear information on forest product markets.

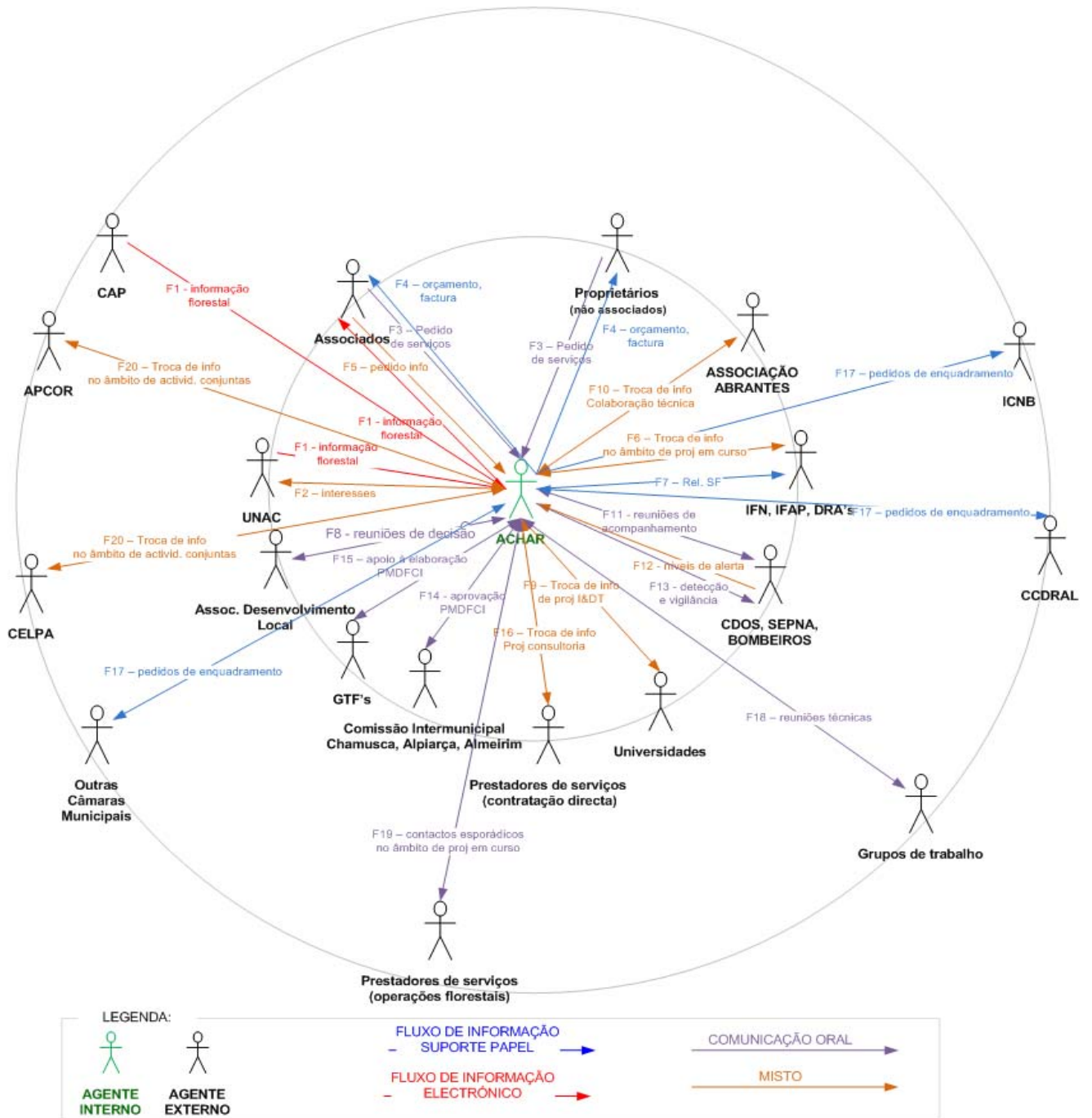
## **4.2 ACHAR**

### **4.2.1 Stakeholder Context diagram**

From the context diagram, Figure 7, we can conclude that they intervene on issues related to:

- forest owners;
- municipalities;
- universities; and
- associations of industrial organisations and agencies (centralised and local).

Forest owners are not entities with whom they exchange information with regularly. This is due to the fact forest owners require more technical information on forests.



Ver tabela de fluxos de informação

Figure 7. ACHAR stakeholder context diagram



#### 4.2.2 Business process

**Table 6. The business processes derived from the context diagram for ACHAR**

Name of process	Name of sub-process	Brief description
P1. Services provided to forest owners		Includes several sub-processes related to services provided by ACHAR managers / owners forest
	P1.1 Elaborate the forest management plan	The process is triggered by a forest manager / owner relies on ACHAR to develop a forest management plan. ACHAR prepares a budget for the service. In case the budget is accepted, it develops all the necessary activities for the production of a simple or more complicated forest management plan.
	P1.2. Development of the forest inventory	The process is triggered by a forest manager / owner and consists of the planning, implementation and organisation of data collected in forest inventory.
	P1.3. Mapping of production	Consists of gathering the basic information and produce a thematic map.
	P1.4 Accompany the forest operations	It consists of following the field operations of on-going projects in order to benefit afforestation in forests under the management of ACHAR.
	P1.5. Evaluation of the quality of cork	The process is initiated by the forest manager / owner. Sampling of trees, followed by laboratory analysis, helps determine the quality of cork. This is performed in accordance to a common protocol for all UNAC associations.
	P1.6. Management of pests and diseases	Performed by the manager / land owner. It consists in doing a forest inventory of pests and diseases, followed by the monitoring and implementation of control measures, and finally monitoring the evolution of pests and diseases in order to assess the effectiveness of treatment.
	P1.7 Prepare the candidacy for projects (benefits and afforestation)	Is consists of the preparing the administrative and financial aspects of project applications and afforestation plans as well as the project follow-up.
P2. Forestry knowledge transfer		Gathering of relevant information on forests, such as legislation, news and events and making them available to all members.
P3. Representation of interests and defence of associate members		Includes an account of the needs and the positions of members, which is then transmitted to UNAC and CAP, who are directly involved in national forest policy. It

Name of process	Name of sub-process	Brief description
		also includes taking part in meetings and decision-making on issues of interest to the sector, such as forest certification.
P4. Support of marketability of forest products		Contributes to a better valuation of the associates' forest products. Includes management and ZIFs, and Forest Certification support.
	P4.1. Management of ZIFs	Includes all management activities of ZIFs, in order to improve the structure of defence against forest fires, the action plans for managing forest pests and diseases and for the management of information forest areas of the ZIFs.
	P4.2. Support in forest certification	Includes initiatives that promote the certification of forest products for associate members.
P5. Research and development		Developing applications and implementing community forestry research, with or without the partnership of universities and research centres.
P6. Fire risk protection		Plan, implement and monitor the DFCI measures, particularly with regard to the detection and monitoring of fires.
P7. Cooperation and development at local level		Participation in ACHAR meetings and decision-making initiatives aimed at promoting the region's economic development.
P8. Administration (fire-fighters)		Support process for the maintenance of the ACHAR structure. Includes the management of its human resources, particularly of forest fire-fighters, and the sub-processes of invoices for services rendered.
	P8.1. Management of forest fire-fighter support team	Control of the teams and the work performed by ACHAR's fire-fighter support team.

#### 4.2.2.1 Business process – flow of information

In terms of the flow of information, as shown in Table 7, they proceed informally, usually via email. The information, which they send to other organisations such as UNAP and CAP, can consist of legislations, news and events. In general, information flow within ACHAR does not have a set structure; these include reunion discussions, verbal communication with technicians. There is no information system for numbering, documenting or storing the information that circulates within the organisation.

**Table 7. Information flows within the ACHAR**

ID_flow	Name	Description	ID_proc	Observation
F01	Forestry information	Information collected by or available to the UNAP or CAP and its members, which in turn are reaching the forest owners. Includes: laws, news, events	-	Distributed via email. Also available on the intranet for Members of ACHAR.
F02	Interests	Disclosure of interests, positions and needs of forest owners, their associates -	-	Notified via email or at meetings with technicians
F03	Request Service	Request Service to ACHAR	-	Oral communication at ACHAR with the technician who is responsible for follow-up.
F04	Budget, billing	Documents invoice sent to the forest owner in connection with services provided by ACHAR	-	Paper documents not numbered. The detail of the service will be recorded internally in a worksheet (paper and Access)
F05	Request for information	Request for information on forests to ACHAR for an associated member	-	Notified via email, on-site or at meetings of members
F06	Info about projects	Exchange information on projects in progress, under the management of ACHAR	-	Email, letter, fax, etc...
F07	Report on Sapper Forest	Quarterly Report on the activities of the Sapper Forest Service ACHAR	-	Paper format
F08	Meetings	Sharing of information at meetings to decide on local development. Participation in the strategy and program, the local action.	-	Participation in meetings of decision
F09	Exchange of R&D information	Information exchange on projects and applications R & D in partnership with Universities	-	Email, letter, fax, etc...
F10	Information exchange technical collaboration	Information exchange under the technical collaboration between these associations. ACHAR provides support in forestry and receives Association of Abrantes that require support in agriculture.	-	Email, letter, fax, etc...

ID_flow	Name	Description	ID_proc	Observation
F11	Follow-up meetings	Weekly sharing of information on the monitoring of forest fires during critical period.	-	Participation in follow-up meetings.
F12	Warning levels of warning about the risk of forest fire	Levels of warning about the risk of forest fire. They are used by ACHAR to plan the activities of Sapper Forest	-	Distributed via e-mail, fax, and SMS
F13	Detection and Monitoring	Radio communication of the result of actions to detect and monitor forest fires, carried out by Sapper Forest ACHAR.	-	Distributed via e-mail, fax, and SMS
F14	Approval of PMDFCI	Participation in meetings of approval of PMDFCI	-	Participation in decision meetings
F15	Technical support for the preparation of GTF PMDFCI	Technical support for the GTF preparation of the Municipal Defence Against Forest Fires	-	Participation in decision meetings
F16	Exchange of information for consultation project	Exchange information on projects for consultancy services provided to ACHAR as well as partnerships with consulting firms and technical support forest	-	Email, letter, fax, etc...
F17	Requests for orders	Orders made under the ACHAR framework by third parties in the context of forest management plan	-	Requests and replies on paper
F18	Technical Meetings	Sharing of information for the weekly monitoring of forest fires during the critical period, during regular technical meetings with other representatives of the forestry sector. Ex: CT145 technical meetings	-	Participation in meetings
F19	Sporadic contacts for the ongoing project	Sporadic contacts for the ongoing reforestation project or improving the current owner of a associate ACHAR	-	Oral communication
F20	Exchange of information for joint projects	Exchange of information between ACHAR and the companies representing the manufacturing, cork and eucalyptus suppliers, involved in joint activities such as fairs, exhibitions, debates, etc...	-	Email, letter, fax, etc...

### 4.2.3 Description of processes – ID of processes

#### 4.2.3.1. Process P1.1. Development of a Forest Management Plan

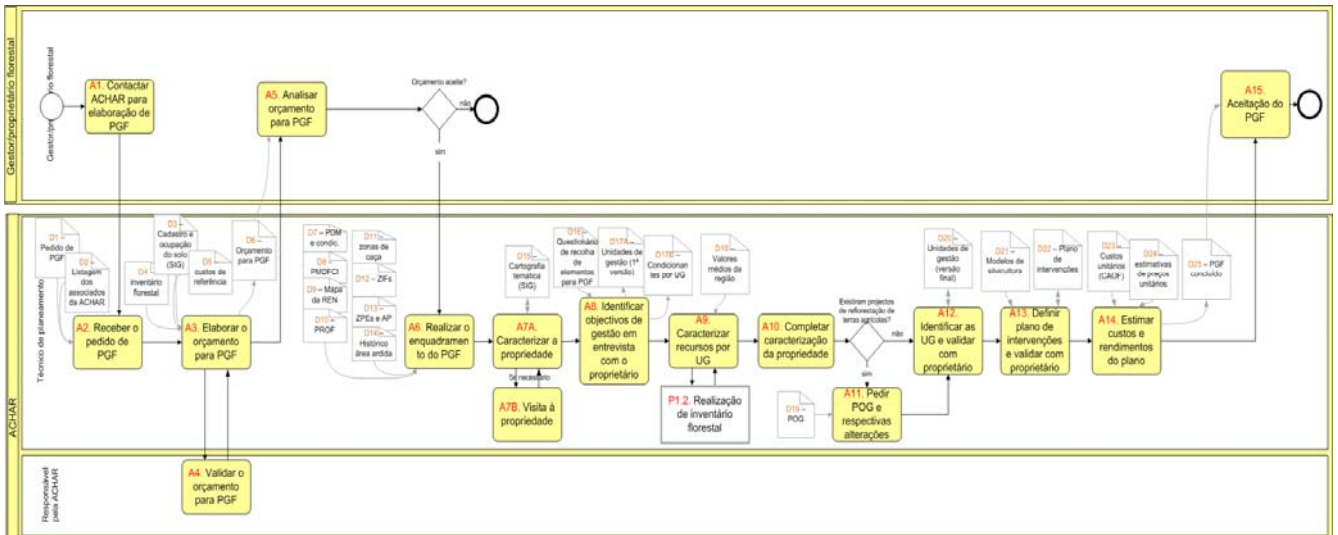
Identification of Process	
ID_process	P1.1.
Category	<i>Business</i>
Name	Development of a Forest Management Plan
Objectives	Develop simple or complicated forest management plans depending on the forest manager/owner.
Location	ACHAR office
Frequency	Occasionally
Current process?	TRUE

Responsibility	
Responsible	ACHAR's planning technician
Mediating agent	Associate members, non-affiliated property owners, ACHAR (planning technician and the Head of ACHAR), organisations consulted in the development of the forest management plan (AFN, GTFs, Municipal Councils, ICNB, CCDRAL)

Description of Process	
Description	The process is triggered by a manager / land owner who uses the ACHAR to develop a forest management plan. ACHAR prepares a budget for the service and if it is accepted develops all activities necessary for the production of simple or complicated forest management plan
List of activities	<To be completed after the flowchart is validated>

Information sources of input and output processes	
Input information	<To be completed after the flowchart is validated>
Output information	<To be completed after the flowchart is validated>

#### Flow chart of the process



**4.2.3.2 Process P1.4. Accompaniment to the forestry operations**

Identification of Process	
ID_process	P1.4.
Category	Business
Name	Accompaniment to the forestry operations
Objectives	Accompaniment of the forestry fieldwork operations in the context of the beneficial and afforestation management projects of ACHAR
Location	Forest properties
Frequency	Occasionally
Current process?	TRUE

Responsibility	
Responsible	ACHAR planning technician
Mediating agent	ACHAR planning technician, forest manager/owner, service providers (forestry operations)

Description of Process	
Description	Consists in current forestry fieldwork operation in the context of the beneficial and afforestation management projects of ACHAR
List of activities	<To be completed after the flowchart is validated>

Information sources of input and output processes

Input information	<To be completed after the flowchart is validated>
Output information	<To be completed after the flowchart is validated>

#### Flow chart of the process

< Process flowchart to be inserted>

#### 4.2.3.3. Process P1.7. Improvements or afforestation project proposals

Identification of Process	
ID_process	P1.7.
Category	<i>Business</i>
Name	Improvements or afforestation project proposals
Objectives	Prepare project proposals for associate members
Location	ACHAR office
Frequency	Occasionally
Current process?	TRUE

Responsibility	
Responsible	ACHAR's planning technician
Mediating agent	ACHAR's planning technician, forest manager/owner, IFAP

Description of Process	
Description	Consists in preparing the proposals for projects, how they are to be executed from an administrative and financial perspective
List of activities	<To be completed after the flowchart is validated>

Information sources of input and output processes	
Input information	<To be completed after the flowchart is validated>
Output information	<To be completed after the flowchart is validated>

Flow chart of the process

< Process flowchart to be inserted >

4.2.4 Business model

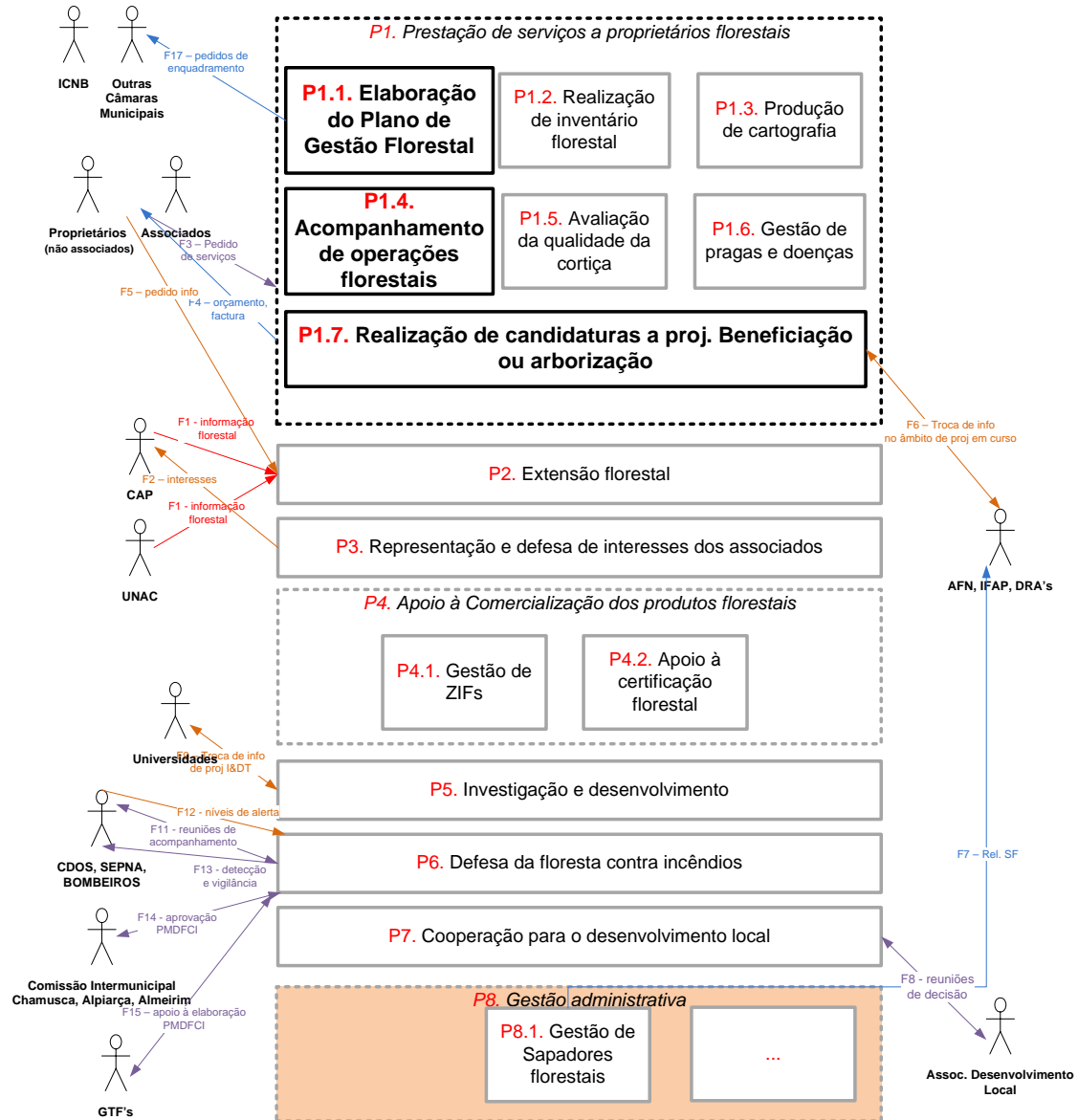


Figure 8. The business model for ACHAR



**Table 8. A summary of the business model for ACHAR**

Business processes	Interaction with other agents	Information flows
P1. Services provided to forest owners P1.1 Elaborate the forest management plan P1.2 Development of forest inventory P1.3 Mapping of production P1.4 Accompany the forest operations P1.5 Evaluation of the quality of cork P1.6 Management of pests and diseases P1.7 Realise candidacy for projects (benefits and afforestation)	ICNB  Other municipalities  Non-affiliated forest owners  Affiliated forest owners  AFN, IFAP, DRAs	<i>To and from external parties:</i> F17. Applications framework F3. Provision of services F5. Provision of information F4. Budget, billing F.6 Exchange of information in the framework of the ongoing project
P2. Forestry knowledge transfer P3. Representation of the interest and defending ACHAR's associates	CAP  UNAC	<i>To and from external parties:</i> F1. Forestry information F2. Interests
P4. Support marketability of forest products P4.1 Management of ZIFs P4.2 Support in forest certification		-
P5. Research and development		<i>To and from external parties:</i> Exchange of project information and I&DT
P.6 Fire risk protection	CDOS, SEPNA, Fire-fighters  Inter-Municipal Commission incl. Chamusca, Apliedra, Almeirim  GTF  Local Development Association	<i>To and from external parties:</i> F12. Warning levels F11. Monitoring F13. Detection and surveillance  F14. PMDFCI approval  F15. Support and development PMDFCI  F8. Decision meetings
P.8 Administration P.8.1 Fire-fighter support team	AFN, IFAP, DRAs	F7. Report on Sapper Forest

## 4.2.5 Description of processes – dictionaries

### 4.2.5.1 Dictionary of profiles

ID_profile	Name	Interview?	Use of the AFM tool box	Importance/ grade of influence	Observations_stakeholder
Pe_01	ACHAR:	TRUE	direct user	high	An association that provides technical support to forest owners on their forest management. Summarises needs and positions of their owners and make them available to the UNAC defending those interests with the AFN.
Pe_02	UNAC	TRUE	indirect user	medium	Not directly involved in forest management made by the owners, but adds requirements and defends the interests of its member organisations, with the AFN
Pe_03	Affiliated members	TRUE	direct user	high	Directly involved in the management of their forest areas
Pe_04	Owners (not affiliated)	FALSE	direct user	medium	Assumed in this project that have a behaviour towards forest management similar to those associated ACHAR
Pe_05	Association of Abrantes	FALSE	indirect user	reduced	Forest owners of the Association of Abrantes are supported indirectly by ACHAR.
Pe_06	AFN, IFAP, DRAs	TRUE	interested user	medium	The AFN is interviewed during the course of this project
Pe_07	CDOS, SEPNA, Fire-fighters	FALSE	passive user	reduced	The management of DFCI recommends actions included in the forest management plan, but its operational structure not directly involved in forest management.
Pe_08	Universities	FALSE	interested user	high	-
Pe_09	Association of Local Development	FALSE	passive user	reduced	-
Pe_10	Inter-municipal council of Chamusca, Alpiarça e Almeirim	FALSE	passive user	reduced	-

ID_profile	Name	Interview?	Use of the AFM tool box	Importance/ grade of influence	Observations_stakeholder
Pe_11	GTFs	FALSE	passive user	medium	-
Pe_12	Service providers (directly contracted)	FALSE	interested user	reduced	-
Pe_13	Other Municipal councils	FALSE	passive user	reduced	-
Pe_14	CCDRAL	FALSE	passive user	reduced	-
Pe_15	ICNB	FALSE	passive user	reduced	-
Pe_16	CAP	FALSE	passive user	reduced	-

#### 4.2.5.2 Dictionary of activities

ID_activ	Name	Description	Observations	ID_proc
A01	Contact ACHAR for the forest management plan	The forest manager or owner meets with the association expressing interest in making a forest management plan for their property, performed at the ACHAR headquarters	Can meet with any of the technicians	P1.1.
A02	Receive request for forest management plan	Surveyor meets with the owner and explains his doubts on the forest management plan. Checks whether or not it is associated with ACHAR and obtains necessary information to achieve the budget	-	P1.1.
A03	Prepare budget for forest management plan	Consists in identifying the property, calculating the area covered and determine the need for implementation of forest inventory. A forest inventory may be necessary. It is necessary to consult the existing forest inventory and decide on the need to decide whether or not a new forest inventory. If so, it is necessary to estimate the number of parcels to include in the inventory. Once completed, the budget is sent to the owner.	-	P1.1.
A04	Validate the budget for the forest management plan	The budget has to be done formally validated by an official of ACHAR before being sent to the owner.	-	P1.1.
A05	Analyse the budget for the forest management plan	The manager/owner reviews the budget for forest management plan and decides whether to accept it	-	P1.1.

ID_activ	Name	Description	Observations	ID_proc
A06	Implementing the framework of forest management plan	The framework is an integral component of the forest management plan. It integrates: a) the framework for Management Plan to quantify areas classified as REN, RAN, or cork oak on the property, as well as identifying other constraints to the management (e.g. sites of architectural interest), b) framework in PMDFCI to identify the areas included the bands primary fuel management and identify constraints in terms of surveillance and fire hazard; c) allocation of REN d) compliance with relevant PROF to identify homogeneous sub-regions where it is incorporated and what the objectives proposed for these, e) framework in hunting areas, f) framework in place, and ZIFs, g) placement in Special Protection Areas and Protected Areas, and h) history of the area burned in the region.	Requires the compilation of a lot of descriptive information in different formats and repositories independent. If the information is not available / current, requires contacts with the authorities.	P1.1.
A07	Characterises the property,	Includes: physiology and slopes, hydrology, climate and soil lithology and characterization of the entire forest area included in the property	-	P1.1.
A08	Identify management objectives in an interview with the owner	The management objectives for each spot of land use patterns are defined by the manager in conjunction with the technical ACHAR. Management units derived from the division of spots intended occupation. In general, are only considered here the objectives of mono-(wood, bark or fruit). Features other facilities associated with the property (ecotourism, hunting, fishing, resin, beekeeping, grazing, herbs, mushrooms, other)	The interview with the owner can help collect additional information about the property, useful for forest management plan.	P1.1.
A08	Visit to properties	In the case of a little known property by ACHAR's technician, a visit to the property is required to collect information on the site, including: density, type of natural regeneration, understory, age, quality of trees.	Performed by ACHAR's technician. Can be accompanied by the forest manager	P1.1.
A09	Characterise the resources for each Management Unit	The following is a description of resources (cork, eucalyptus, pine) present in each zone of occupation. This description is done using the inventory or the average values of the region.	-	P1.1.
A10	Complete the description of the property	Complete description of the property, including the identification of risks (erosion, pests and diseases, etc.) and infrastructure	-	P1.1.

ID_activ	Name	Description	Observations	ID_proc
		(roads, firebreaks, water points) per Management Units		
A11	Request for a POG and respective alterations	Request from the owner registered in the Intervention Plan for a POG, the transactions contemplated by POG and amendments thereto.	-	P1.1.
A12	Identify Management Units and validated by the owner	After recording the description of property, the technician will make a definitive identification of Management Units. This activity consists of Management Units subdivisions, according to differences in density or age class. The final statement on the Management Units has to be validated by the owner.	-	P1.1.
A13	Define the intervention plan and validated by the owner	Scheduling of the forestry operations and management units, to be carried out on a yearly basis, according to the forestry models adopted	-	P1.1.
A14	Estimate the costs of the plan	Unit costs (€/ha/operation) are estimated based on the matrix CAOFA. Yields are calculated only for the complex forest management plan. In this case, the revenue per unit (€/@ or €/m <sup>3</sup> ) are removed from the UNAC table or provided by the owner, and the production is estimated from the survey or the average values of the region.	The costs are indications. Not based on information from forest contractors.	P1.1.

#### 4.2.5.3 Dictionary of information sources

ID_source	Name	Description	Typology	ID_proc	Observations
-D01	Request the forest management plan	Request for the development of a forest management plan, created by forest owner or one of ACHAR's technicians	other	P1.1._I	Verbal request during the start up meeting
D02	List of associate members of ACHAR	Identify associate members of ACHAR	mixed	P1.1._I	Exists various ways of recoding associate members (e.g. excel, database, paper); difficult to bring up to date
D03	Land cover map (GIS)	Shape files with the area and land use maps of conducted	Computerised document	P1.1._I	GIS

ID_source	Name	Description	Typology	ID_proc	Observations
		by ACHAR using remote sensing			
D04	Forestry inventory	Existing forest inventory in ACHAR prepared as part of research projects with the ISA	Computerised document	P1.1._I	Access Database
D05	Reference costs	Reference costs (€/ha) for the implementation of forest management plan. Costs vary depending on the need for a forest inventory or not. Cost also increases if the owner is not an affiliated member.	Computerised document	P1.1._I	Excel
D06	Budget for forest management plan	Total cost for the realisation of the forest management plan by ACHAR	Computerised document	P1.1._O	Archived Word document in the ACHAR server. Paper copy given to the owner
D07	Municipal Director's Plan and the regions' conditions	Municipal Director's Plan and the regions' conditions Document of the occupation of space at the county level. Provided by the respective City Council. The forest management plan is considered to be the framework for the property in the RAN, REN and cork oak as sites of archaeological or social interest, and other constraints.	Computerised document	P1.1._I	GIS; provided by the GTF in the region or other Management Units from City Hall.
D08	PMDFCI	Municipal Plan for the Defence of Forest Fire, provided by the GTF of its Municipality. For the purposes of	Computerised document	P1.1._I	GIS; provided by the Inter-municipal Council

ID_source	Name	Description	Typology	ID_proc	Observations
		forest management plan interested in identifying restrictions on management in terms of fuel management, monitoring, risk and danger of fire.			
D09	Map of REN	Map of the REN to identify the areas designated for electrical installations.	Computerised document	P1.1._I	GIS; provided by the GTF in the region
D10	PROF	Regional Plan for the region of the property. The forest management plan should consider the homogeneous sub-regions of the property	Computerised document	P1.1._I	Management plan
D11	Hunting zones	Map of location of hunting areas in the region. Provided by the GTF in the region	Computerised document	P1.1._I	GIS
D12	ZIFs	Maps of location of existing Zips for the region of the property	Computerised document	P1.1._I	GIS; applications available for ACHAR and management of the ZIF
D13	Special Protection Zones (ZPE) and Protection Areas	Location maps of ZPEs and Protected Areas. Provided by ICNB.	Computerised document	P1.1._I	GIS
D14	History of the burnt area	Maps of the historical evolution of the burnt area, in order to update the land map of the region	Computerised document	P1.1._I	GIS, provided by the AFN
D15	Thematic map	As part of the description of the property, several thematic maps are produced, which include: physiology and slopes,	Computerised document	P1.1._I; P1.1._O	GIS

ID_source	Name	Description	Typology	ID_proc	Observations
		hydrology, lithology, soil and climate			
D16	Questionnaire on the necessary elements of a forest management plan	Questionnaire completed by the forest manager or the ACHAR technician responsible for the forest management plan. Includes: 1) Description of the manager, 2) description of the properties, 3) description of the operation, 4) description of resources (cork, eucalyptus, pine, other associated resources), 5) Requirements; 6) Presence of natural risk, 7) Infrastructure; 8) History of management; 9) Plan of action	Paper document	P1.1._I	Will be used as a base to characterise the exploration and definition of management units and objectives
D17A	Management units (1 <sup>st</sup> version)	First approach to the management units. MU are the result of the division of forest in order to comply with the main objectives of the owner	Paper document	P1.1._O	Will be reviewed when operations are given a date and time
D17B	Conditions for Management Unit	Identification of main constraints in each Management Unit. Includes: pipelines, social areas, sites of archaeological interest, RPU, Agro-environmental	Paper document	P1.1._O	-
D18	Average values of the region	If forest inventory not available, the description of	Other	P1.1._I	General knowledge of the association



ID_source	Name	Description	Typology	ID_proc	Observations
		resources is done using the average productivity of the region applied to the cork, eucalyptus, and pine.			
D19	POG	Management Orientation Plan defined in projects of reforestation of agricultural areas	Paper document	P1.1._I	Provided by owner
D20	Management Units (final version)	Version of management units that constitute the property	Computerised document	P1.1._I, P1.1._O	GIS
D21	Silvicultural models	Timing of forest operations to be implemented over the life of the settlement, according to the types of species and uses	Paper document	P1.1._O	Models of silviculture are stated in the PROF and following recommendations of the AFN publications
D22	Intervention plan	Joint forestry operations planned for the property. Includes: type of intervention, management unit, species and area (for the first 5 year)	Paper document	P1.1._I, P1.1._O	It merely provides the operations, not the features. It includes operations necessary to meet the complementary goals of management. The constraints are described in Management Units and are mentioned with regard to good forestry practices.
D23	Units Costs (CAOF)	Reference tables of unit costs (€/ha) for major forest operations compiled by CAOFA	Paper document	P1.1._I	Most updated estimates from 2007
D24	Estimates of unit prices	Unit prices for cork (€/@), wood (€/m3) and fruit (€/ton) established with the UNAC or provided by the owner	Paper document	P1.1._I	-

-

#### **4.2.6 Preliminary summary of results for ACHAR**

To summarise, ACHAR do not manage forests. They provide technical services to forest owners, associates and non-associate members when required. The forest management plans need background information from various sources; however, some background information, such as maps, may be difficult to access, which then delays the planning process. Additionally, they do not perform follow up operations. The forest owners are responsible for the implementation of the forest management plan, and they decide the type of maintenance operations required. As a result, ACHAR is not aware of any operations or their costs.

4.3 GTF

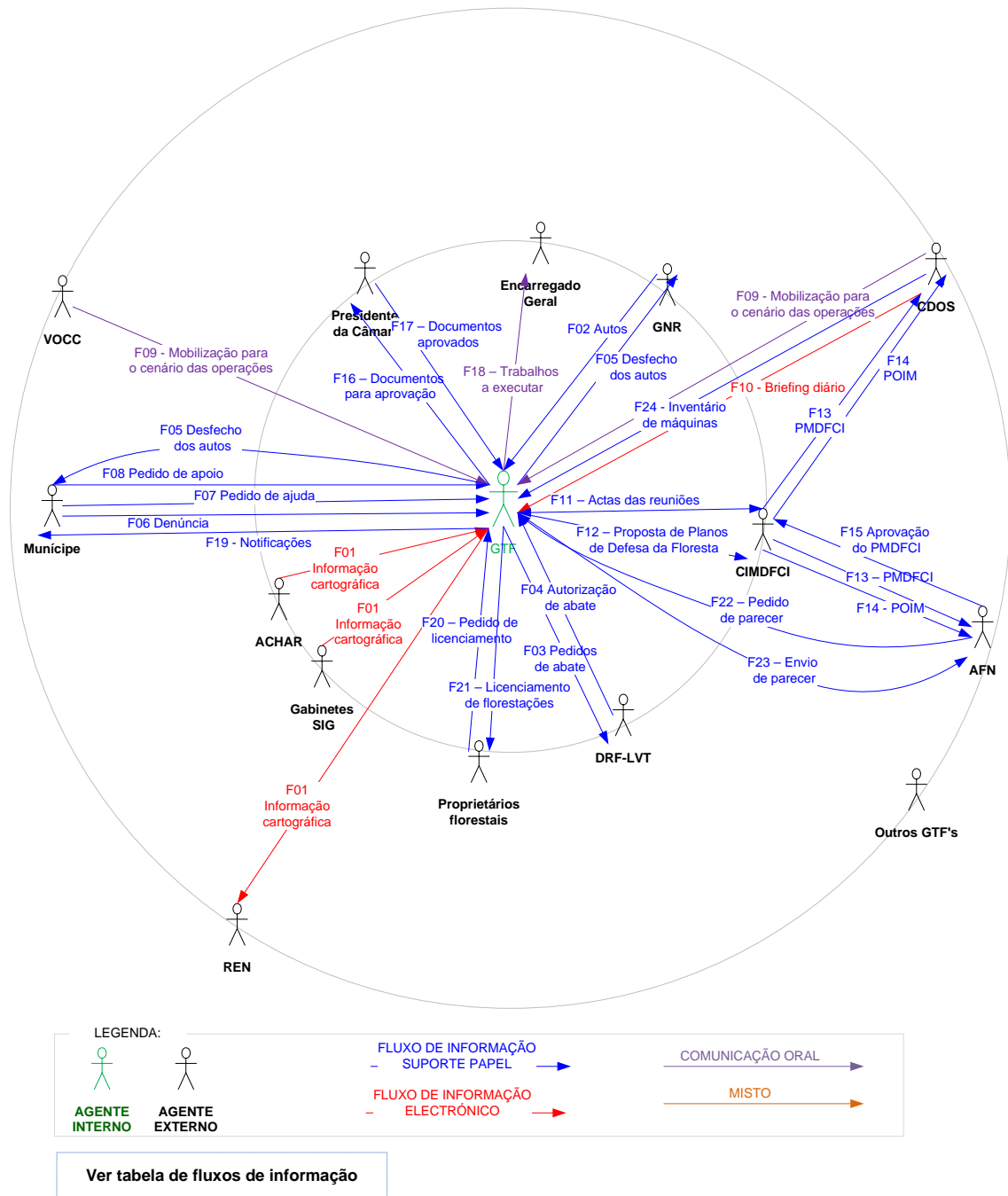


Figure 9. GTF stakeholder context diagram

The context diagram in Figure 9 provides the global overview of the GTF interactions with their stakeholders. To summarise, we can conclude that they intervene on issues related to:

- citizens;
- forest owners and associations;

- authorities or regulators in charge of planning processes;
- Municipal Plan of Defence Against Forest Fires (PMDFCI), and the Inter-Municipal Operation Plan (POIM);
- management of the process of control for the irregularities or non-compliance to legislations; and
- all communication processes involving external parties (approved by the Chairman of the Board of the GTF central headquarters).

#### 4.2.3 Business process

**Table 9. A summary of business processes derived from the context diagram for GTF**

Business processes	Interaction with other agents	Brief description	Information flows
P1. Analysis of requests for afforestation	Forest owners AFN Mayor	In a given project, the GTF connects with the PDM or other legal constraints, in order to record the decisions made at the city council session.	
P2. Management and record of problems in forest areas.	Municipality GNR	Analysis of complaints and records relating to atypical situations, gathering of additional information and preparing a report to submit to the Mayor	
P3. Prepare a PMDFCI	ACHAR GIS Office CDOS CIMDFCI AFN	Prepare a PMDFCI for subsequent approval at the CIMDFCI level.	

##### 4.3.2.1 Business process – flow of information

In terms of the flow of information, as shown in Table 10, nearly all communication processes are done on paper, even when it's informal situation. These include, letters of approval for the

PMDFCI, approval documentation, inventories, complaint reports, and help requests. Some exceptions to the paper format of the information flow are for digitalised information (e.g. maps) or those that arise in emergency situations (e.g. fire) in which case, it is based on oral communication.

**Table 10. Information flows within the GTF**

ID_flow	Name	Description	ID_proc	Observations
F01	Mapping information	Essential mapping information for elaborating the PMDFCI for: urban districts, fuel management tracking, water points, roads and paths, soils, ZIFs, etc...	P03	-
F02	Condition	Conditions put forward by the GNR on prohibited or dangerous actions, such as fires.	P02	-
F03	Request for harvesting	Harvesting requests in areas under the Municipality's management responsibility.	-	-
F04	Authorisation of harvests	Responding to requests to harvest	-	-
F05	Outcomes	Communication of the outcome of the documents submitted by the GNR.	P02	-
F06	Complaints	Complaints made by the Municipality related to the GTF activities: the need to clear the woods, fires, etc...	P02	-
F07	Help request	Requests for help from local authorities for performing the fire prevention operations essential to the proper management of their forests.	-	-
F08	Request for technical support	Request for technical support, including the preparation required for removing cork.	-	Support is only provided in the preparation of applications, which is submitted to the DRF-LVT.
F09	Mobilisation to the scenario of operations	In critical situations, the elements of the GTF are mobilized to the scene of operations	-	By phone
F10	Briefing diary	Daily information sent during the critical period of current situations. It indicates the predicted values of various parameters directly related to the risk of fire and other data relating to operation management	-	-
F11	Minutes of the meetings	The GTF is responsible for drafting the minutes of meetings, which are then circulated to all stakeholders to ensure	-	-

ID_flow	Name	Description	ID_proc	Observations
		their agreement, after which, they are sent to the Mayor for his signature and for general distribution.		
F12	Proposed plans for forest protection	GTF prepares the PMDFCI and POIM (Inter-Municipal Operational Plan) to present to CIMDFCI for discussion	P03.	-
F13	PMDFCI	Municipalities' plan of action and strategies after the sounding the fire alarm.	P03.	The PMDFCI is sent to the AFN for approval, after which it is sent to the CDOS.
F14	POIM	Plan prepared every year, reporting of real situations to help assist with the more general provisions in PMDFCI	P03.	The POIM is an approved level of the CDOS and CIMDFCI using knowledge from the AFN
F15	Approval of the PMDFCI	Approval of the PMDFCI sent by the AFN to CIMDFCI	P03.	-
F16	Documents for approval	All documents created for the GTF and which involve communication with third parties must be approved by the Mayor.	P01., P02.	-
F17	Approved documents	Notice with the approval of documents so that the process involved can be followed up	P01., P02.	-
F18	Work to do	Let the Municipal Board know the work that will be performed	-	Usually oral communication, but can be accompanied by a piece of work or justification (opinion, notification, etc...)
F19	Notifications	Notifications issued or complaints reported to the Municipal Board	P02.	-
F20	Permit applications	Permit applications for afforestation using official forms.	P01.	The form only consists of a suggestion for cases where forest lands of 50ha.
F21	Forestry permits	Issuing permits for afforestation only to land areas greater than 50ha.	P01.	-
F22	Afforestation permits	Requests for afforestation permits for an area of 50ha.	P01.	-
F23	Sending	Sending of afforestation request, as a	P01.	-

ID_flow	Name	Description	ID_proc	Observations
	afforestation	certified copy of the minutes of the meeting of the Municipality		
F24	Machinery inventory	Inventory of machinery available for use in incidences of forest fire fighting, to be integrated in the PMDFCI	P03.	-

### 4.3.3 Description of processes – ID of processes

The representation of decision-making has a hierarchical structure, with level 0 as the business model. The process of level 1 is represented by a flowchart, showing the respective activities and information sources.

#### 4.3.3.1 Process P01. Analysis of forestry requests

Identification of Process	
ID_process	P01.
Category	<i>Business</i>
Name	Analysis of forestry requests
Objectives	Create a statement to authorise afforestation, in function of the dimension of the project (more or less 50ha)
Location	Councils of Chamusca, Alpiarça e Almeirim
Frequency	Annually
Current process?	TRUE

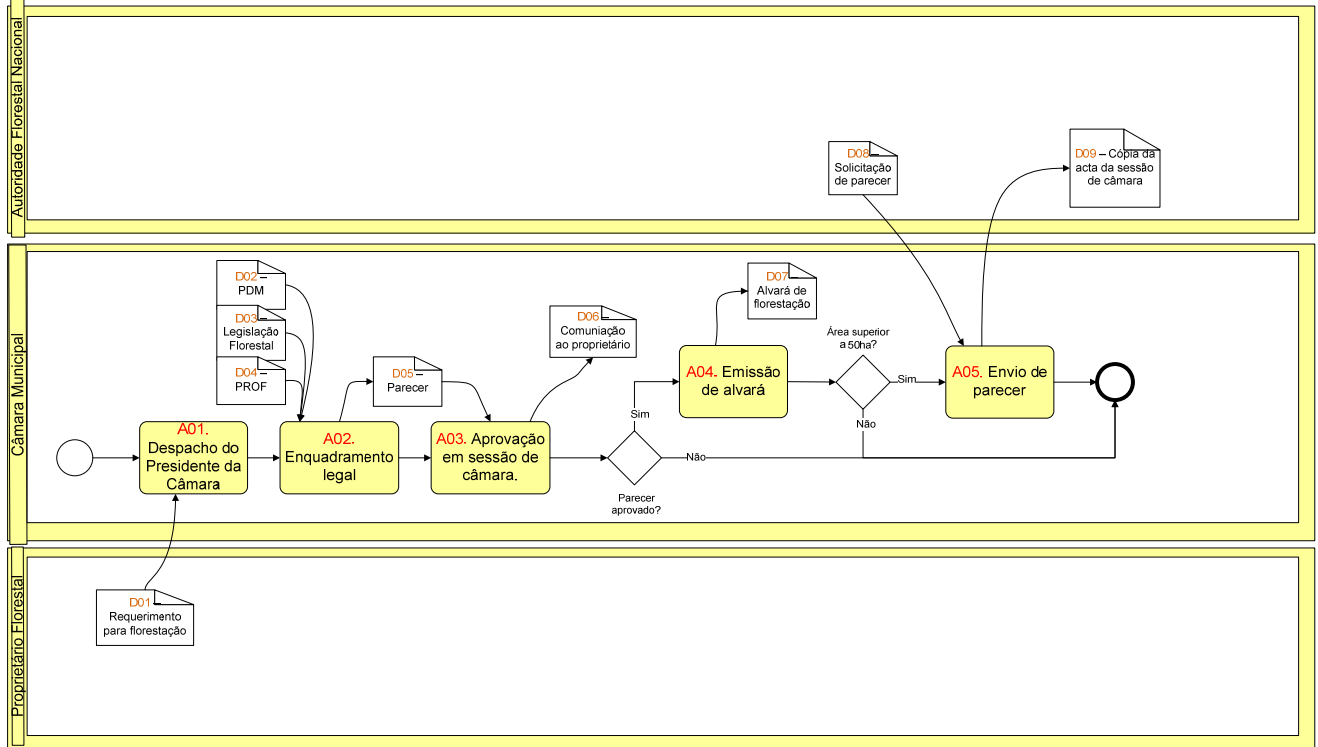
Responsibility	
Responsible	GTF
Mediating agent	Technicians of GTF

Description of Process	
Description	Faced with a given project, the GTF connects the management plan with any possible legal constraints, and issues a statement that is put on record during the council session.
List of activities	A01, A02, A03, A04, A05

Information sources of input and output processes	
Input information	D01, D02, D03, D04, D05, D08

Output information	D05, D06, D07, D09
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Flow chart of the process



**4.3.3.2. Process P02 – Management of conditions and claims in the forestry areas**

Identification of Process	
ID_process	P02..
Category	Business
Name	Management of conditions and claims in the forestry areas.
Objectives	Provide an answer to unusual situations on the risks reported to the municipalities and their authorities
Location	Councils of Chamusca, Alpiarça and Almeirim
Frequency	Annually
Current process?	TRUE

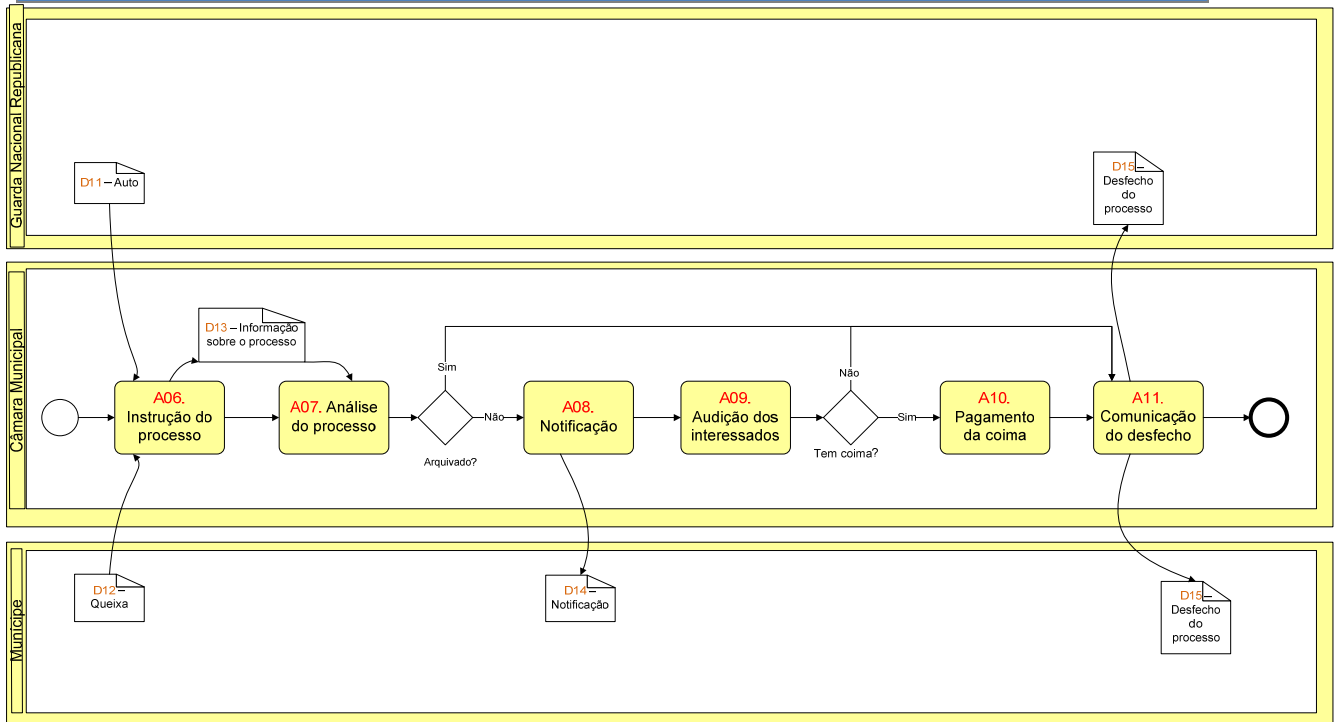
Responsibility	
Responsible	
Mediating agent	GTF, GNR, Chairman of the Municipal Board



Description of Process	
Description	Analysis of the complaints and the conditions related to the unusual situations, collection of complimentary information to be sent to the Chairman of the Municipal Board.
List of activities	A06, A07, A08, A09, A10, A11

Information sources of input and output processes	
Input information	D11, D12, D13
Output information	D14, D15

### Flow chart of the process



#### 4.3.3.3. Process P03. – Development of a PMDFCI – Municipal Plan of Defence Against Forest Fires

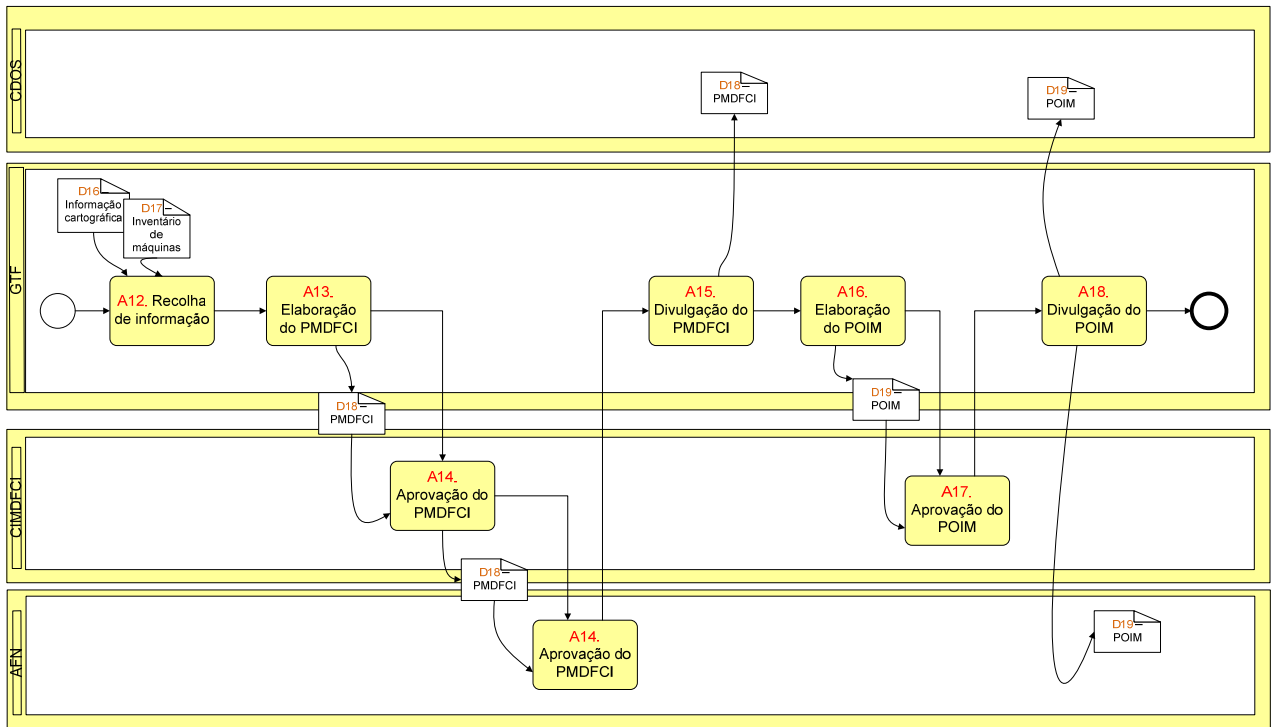
Identification of Process	
Id_process	P03..
Category	<i>Business</i>
Name	<i>Development of a PMDFCI – Municipal Plan of Defence Against Forest Fires</i>
Objectives	Contracts between service providers that will help accomplish the operational plan
Location	Councils of Chamusca, Alpiarça and Almeirim
Frequency	Annually
Current process?	TRUE

Responsibility	
Responsible	GTF
Mediating agent	GTF

Description of Process	
Description	Development of the PMDFCI to be approved at the CIMDFCI level
List of activities	A12, A13, A14, A15, A16, A17, A18

Information sources of input and output processes	
Input information	D16, D17, D18, D19
Output information	D18, D19

Flow chart of the process



### 4.3.4 Business model

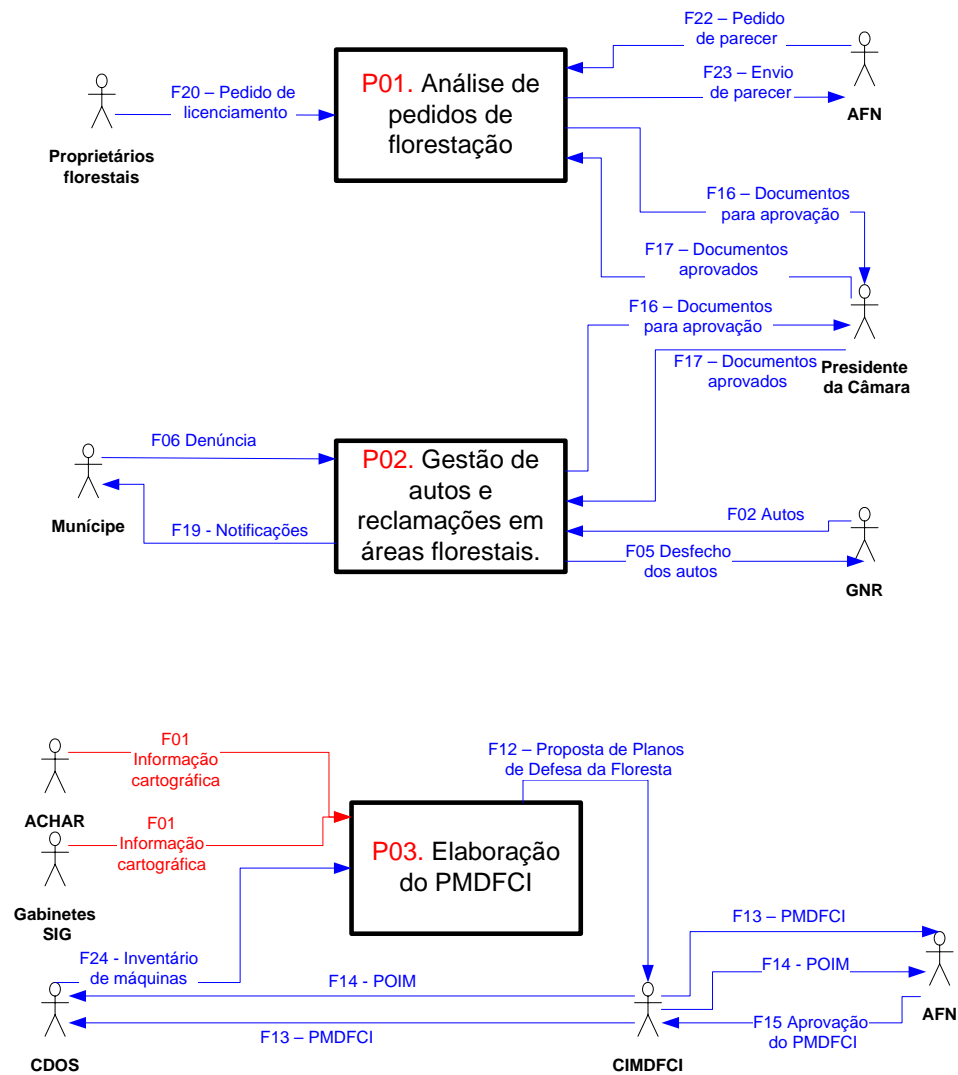


Figure 10. The business model for GTF

Table 11. A summary of the business model for GTF

Business processes	Interaction with other agents	Information flows
P1 Analysis of requests for afforestation	AFN Forest owners Chairman of the Municipality	<i>Information inputs from third parties:</i> F20 Licensing requests  <i>Outputs to third parties:</i> F22 Requests for afforestation F23 Sending opinions  F16 Documents for approval F17 Documents approved

Business processes	Interaction with other agents	Information flows
P2 Management and record of problems in forest areas.	Chairman of the Municipality GNR Municipality	<i>Information inputs from third parties:</i> F06 Complaints F17 Documents approved F02 Authorisation  <i>Outputs to third parties:</i> F16 Documents for approval F19 Notifications F05 Outcome of authorisation
P3 Prepare a PMDFCI	ACHAR GIS Offices CDOS CIMDFCI AFN	<i>Information inputs from third parties:</i> F01 Mapping information F24 Machinery inventory  <i>Outputs to third parties:</i> F12 Proposals for forest defence plans F13 PMDFCI F14 POIM F15 Approval of PMDFCI

#### 4.3.5 Description process - dictionaries

##### 4.3.5.1 Dictionary of profiles

ID_profile	Typology	Name	Organisation it belongs to	Intervention region	Description
Pe_01	Internal	Inter-Municipal GTF	Municipal councils of Chamusca, Almeirim e Alpiarça	At municipal level	Municipal council department responsible for all the activities related to afforestation.
Pe_02	External	ACHAR	N/A	Almeirim, Alpiarça, Chamusca and neighbouring areas, occupying close to 100 000 ha of national territories	Established in 1989, the aim was to promote the development of agro-forestry and pastureland of the Heath, and defend the farmers' interests and represent them regionally. The result is a general increase in rural development, environmental protection, rational management of natural resources and in particular the continuation of interests of its members through joint management of forest areas.
Pe_03	External	National Grid	-	Country wide level	Responsible for distributing energy on a national level

Pe_04	External	Forest owner	-	Their forest properties	Individual or collective forest property owners
Pe_05	External	President			
The Council	Municipal council	-	-		
Pe_06	external	Cabinets			
GIS	Municipal council	Municipal councils of Chamusca, Alpiarça and Almeirim	Council department responsible for the creation or actualisation of maps for their municipalities		
Pe_07	External	VOCC	-	At district level	Vehicles used for operations, maintaining contact with various entities, and responding to relief calls when needed.
Pe_08	External	CDOS	National Authority for Civil Protection	District of Santarém	Centre of operations and communications support, and coordination of relief operations in the district.
Pe_09	External	CIMDFCI – Inter-municipal commission for the Defence of Forest Fires	-	Councils of Chamusca, Almeirim and Alpiarça	Entity responsible for preparing the PMDFCI and the POIM, as well as depicting the various additional agencies for the Councils: ACHAR, CDOS, fire-fighters, AFN, GNR, Afocelca, etc...
Pe_10	External	AFN	Ministry of Agriculture	National Territory	Public bodies with expertise in forest management. The AFN is the National Forest Authority that regulates the forestry sector.
Pe_11	external	DRF-LVT Regional Direction of Forests in Lisbon and the Tejo Valley	AFN	Country level	Public organisations for the management of forests.
Pe_12	external	General Clerk of the Council	Chamusca Municipal Council	Council level	Council responsible for doing the work
Pe_13	external	GNR	Ministry of Internal	-	Their Forest Protection Teams (EPF) provide

			Administration		surveillance of risks that may be potentially dangerous to forests (e.g. fires)
Pe_14	external	Municipality	-	-	-
Pe_15	external	Other GTFs	Municipal Council	Municipal level	The Council department responsible for all activities to forest county level.

#### 4.3.5.2 Dictionary of activities

ID_activ	Name	Description	Observations	Process
A01	Office of the Chairman of the Council	The application is addressed to the Chairman, who dispatches the process for the GTF.	-	P01.
A02	Legal framework	The GTF provides a background for the project, and verifies the information with the PDM (RAN, REN, etc...), as well as with other legal bodies (forestry legislation, PROF, etc...). It provides a statement that is then taken to the Council session.	-	P01.
A03	Approval in the council session	Discussion and approval of the Council's statement	-	P01.
A04	Permit issue	Department of fees and licenses at the councils that issues permits and receipt of fees	-	P01.
A05	Forwarding of statement	Preparation and submission of the AFN's statement, which consist of a certified copy of the Council's meeting minutes.	-	P01.
A06	Instructions of process	The GTF provides a survey of the situation, and goes to the site to confirm processes and provide additional documentation.	-	P02.
A07	Analysis of processes	The Mayor reviews the case and decides whether a follow up is needed.	-	P02.
A08	Notification	A notification is sent to citizens in order for them to testify to the Department of Taxes and Licences.	-	P02.
A09	Hearings of the decisions	Hearing of the decision and follow-up to the process		P02.
A10	Payment of COIMA	-	-	P02.
A11	Communication of the outcome	The outcome of a process is always communicated back to the parties	-	P02.

ID_activ	Name	Description	Observations	Process
		involved: GNR, citizens.		
A12	Information collection	Information collection essential for the development of a PMDFCI.	-	P03.
A13	Development of PMDFCI	-	-	P03.
A14	Approval of PMDFCI	-	The approval is carried out primarily at the CIMDFCI and confirmed by the AFN	P03.
A15	Rejection of PMDFCI	-	-	P03.
A16	Development of a POIM	Development of a POIM	-	P03.
A17	Approval of POIM	-	-	P03.
A18	Rejection of POIM	-	-	P03.

#### 4.3.5.3 Dictionary of information sources

ID_source	Name	Description	Typology	ID_pro c	Observation
D01	Application for afforestation	Application for afforestation plans, application is done using an official form. The application contains the name of the applicant, an identification of the property and its location, the total area and the species to plant.	-	P01	Often this request comes through ACHAR, or Silvicaima Forest Alliance.
D02	PDM – Plan of the Municipal Director	-	-	P01	-
D03	Forest legislation	-	-	P01	-
D04	PROF – Regional Forest Ordinance Plan	-	-	P01	-
D05	Statement	Opinion of the GTF on an afforestation request	-	P01	-
D06	Communication with	Communication with the owner on the decision of the Council.	-	P01	-



ID_source	Name	Description	Typology	ID_pro c	Observation
	owner	If it is approved, they must request a waiver and payment in the Department of Fees and Licenses.			
D07	Afforestation permit	-	-	P01.	-
D08	Statement request	Request for a statement by the AFN for the forest area, which must be larger than 50ha.	-	P01.	-
D09	Copy of the Council Sessions act	Certified copy of the minutes of the Council sessions, with the outcome of the evaluation report commissioned by the GTF.	-	P01.	-
D11	Authorisation	Authorisation raised by the GNR on unusual situations, including un-planned fires during critical periods. The authorisation is sent to as a letter to the Municipal Council- the document is on paper with photographs attached.	-	P02.	In Torres Novas, authorisation is sent once consented by the person responsible for the planning permission.
D12	Complaint	Complaints by a local about the idea of burning land or areas that needs to be cleared.	-	P02.	-
D13	Information on a process	Internal information sent to the chairman with all the relevant data of a process	-	P02.	-
D14	Notifications	Notification of the Municipality to testify to a process	-	P02.	-
D15	Outcome of a process	Outcome of the processes involving : GNR, citizens	-	P02.	-
D16	Mapping information	Mapping information and updated description: Land use, ZIFs, access, water points, etc...	-	P03.	-
D17	Machinery inventory	Inventory of machinery available at various locations in the case of need for forest fires interventions.	-	P03.	-
D18	PMDFCI	Municipal Plan for the Defence Against Forest Fires	-	P03.	-
D19	POIM	Inter-Municipal Operational Plan	-	P03.	-

#### **4.3.6 Preliminary results for GTF**

To summarise, the GTF has:

- direct influence on forest management;
- indirect influence, acting through its opinions and / or licensing of projects of afforestation; and
- their activities are predominantly related to the problem of forest fires, through the development and PMDFCI and POIM.

### **5. Discussion**

#### **5.1 Comparison between the Delphi Survey and Enterprise Architecture methods for conducting stakeholder consultation**

Without knowing at this stage the full impact, or effectiveness, the Enterprise Architecture approach to consultation has brought to forest-based research, it seems necessary to evaluate the positive and negative aspects of this approach by comparing it to another type of consultation method that was recently applied to forest-based research at a European scale for the EFORWOOD project ([www.eforwood.com](http://www.eforwood.com)). A review of existing techniques is useful to form an idea of which might fit best to the needs of the investigation in question.

##### **5.1.1 Delphi method**

The main use of the Delphi method is to provide a reliable exploration of ideas or produce suitable information for decision making. The Delphi method was developed from technological forecasting studies. Its primary function at the time was to assist the US Air Force to forecast potential technologies in the 1950s. The Delphi method has since spread to generate forecasts in fields such as technology (e.g. potential inventions, and the socio-economic impacts of technological change), industry, government and academia (Cornish 1977, Adler and Ziglio 1996 cited in <http://www.iit.edu/~it/delphi.html>).

The Delphi method was developed to make discussion between experts possible without resulting to interactive behaviour. It was believed that group discussions sometimes suffer biases, with a “follow the leader” tendencies, or reluctance to abandon generic opinions (<http://www.iit.edu/~it/delphi.html>). It recognizes human intuition, based on learned

experiences or practices, as useful inputs to general forecasting. According to Baldwin (1975 cited in <http://www.iit.edu/~it/delphi.html>), if there is any lack of full scientific knowledge, decision makers have to rely on expert opinion or their own judgement. Forecasting potential new development is derived in the Delphi method through the synthesis of expert judgement (Gordon 1994).

Delphi is an exercise of group communication with a pre-selected panel of experts geographically displaced. It is a structured process based on a questionnaire, the results of which are then aggregated to form part of the answer. Subsequently, experts are asked to provide feedback on the confidence of the overall results. The questionnaire is formulated so that the answers can be processed quantitatively. Every consultation is called a round, and rounds continue until a stable response is achieved amongst experts. The results in subsequent rounds are gathered and presented to the groups in such a way to maintain anonymity between experts. Fowles (1978 cited in <http://www.iit.edu/~it/delphi.html>) underlines the characteristics of the Delphi as anonymity, controlled feedback and statistical response.

The outcome of the Delphi method is highly dependent on the panel of experts, and their opinion. Therefore, careful selection of experts is of utmost importance. A Gordon (1994) states that the number of experts should reflect the fact that acceptance rate is likely to be between 35-70%. For statistical viability, the typical size of a panel is approximately 8-15 experts (Marzano and Edwards, 2009).

The structure of the Delphi is based on the following steps (<http://www.iit.edu/~it/delphi.html> ; Marzano and Edwards, 2009):

1. Prepare a literature review around the subject. This is to help provide current knowledge and become aware of information gaps, as well as potentially identify experts;
2. Decide whether Delphi is the best approach for the investigation by comparing it to other forms of group communication;
3. Select experts in the area to be investigated;
4. Develop the Delphi questionnaire for the first round;
5. Assemble a team of monitors to undertake the Delphi in a given field of research;
6. Perform a trial run of the questionnaire, to clear any ambiguities;
7. Contact the panel of experts and send the first questionnaire by mail;

8. Analyse round one;
9. Prepare a second round of questionnaire (the questions can be the same as the first round), possible testing if necessary;
10. Redistribute the questionnaire by mail to the panel of experts for round two;
11. Analyse the second round of responses (steps 9 to 11 are re-iterated as long as necessary to achieve stable results); and
12. Present the results and the analysis in a report prepared by the monitors.

### **5.1.2. Comparison of the Enterprise Architecture method with the Delphi method**

From the described consultation methods, Enterprise Architecture and Delphi, there are number of strengths and weakness to both. The overarching aim of EA and Delphi is to fill in knowledge gaps for the discipline it describes. They share a common link in that they are both based on integrating human judgement into scientific processes. While the EA is based on collecting and recording qualitative information, the Delphi gathers quantitative information.

The Enterprise Architecture and the Delphi method both treat their respective stakeholders, or experts, independently. Where, the Delphi requires several rounds to confirm the quality of the data, the Enterprise Architecture may require a series of meetings with each stakeholder. The respective stakeholders in both methods must validate the responses collected during consultation.

Data is collected in a standardised way, in accordance to the Enterprise Architecture, where data is processed into an automated information system; or the Delphi method, where the information is recorded by the expert in the questionnaire. The latter method has the advantage that the information is automatically synthesized in a questionnaire format. While on the other hand, the Enterprise Architecture, the information from the interviews must be synthesized separately, and can prove to be a time consuming task.

Both methods invited the stakeholders, or the experts, to participate in the consultation. The Delphi did this by sending out an invitation letter, which included an outline of the project including the aims. The Enterprise Architecture invited all the stakeholders to a kick-off meeting, at which point a presentation was given with the outline of the investigation as well as the methodological approach. If stakeholders were not present at the kick-off meeting, a similar presentation was given at the start of the consultation meeting.

Particular attention was given to the selection of the experts used in consultation for the Delphi method, as the results of the survey are only as good as the opinions given. If the experts prove to be ineffective, the problem lies in the selection of stakeholders rather than the validity of the activity itself. In the case study of Chamusca, this does not apply, as data collection is focused on the stakeholders' decision making processes, rather than their opinions. All forestry-related holders were approached, which included public administration stakeholders (central and local) and representatives of other types of stakeholders.

The end result of each exercise is highly dependent on the objectives of the investigation. For example, the Enterprise Architecture is not just a process consisting merely of technical descriptions in tables and diagrams to be inserted into models; it provides a holistic view on a situation otherwise unavailable. The Delphi method translates experts' opinions and insights from a specified field into a more quantitative format (i.e. scores). In prior applications, Enterprise Architecture and Delphi results have provided technologists with better understanding of the common needs, using a pragmatic description of a business or activity. A summary of the main successes and drawbacks of the Enterprise Architecture and the Delphi method is provided in Table 12.

Some of the most important successes of the Enterprise Architecture include: the large volume of information gathered on the structure and processes of a business; the high level of transparency at which this information is then recorded; and the development of a relationship between monitors and stakeholders. The level of human interaction allows for an amicable relationship between monitors and stakeholders, which is an unlikely possibility with the use of a questionnaire. This kind of activity could also provide useful to strengthen the ties for future partnerships.

Furthermore, the Enterprise Architecture has the ability to dilute the scientific information when presenting the activity to stakeholders. This is because group discussions provide more flexibility in the delivery method, and can be suited to the needs or level of the stakeholder. The interview approach adopted for the Chamusca case study was performed as an informal talk based on the forest management decision levels for each stakeholder.

However, group discussions are not without their drawbacks (EPA 2001). For instance, the first meeting with the panel of stakeholders may result in distrust and open criticisms. They may not understand the necessities of the exercise; i.e. they may need to know what is in it for them, why has this work not been done before, why waste time with something they don't understand will help them when they could be getting on with their work. Monitors must be

effective at defending their work and prevent the perception of stakeholders from devaluing the activity.

It must be duly noted that the outcome of the research using EA is highly dependent on the monitors' interpersonal skills or engagement; any deficiencies in their approach will be highlighted in the results (EPA, 2001). This is unlikely to be a drawback for the Delphi method, since every step of the Delphi process is discussed internally. Careful selection is given to the wording used, the way of addressing the participants, and the exact questions presented to the experts.

**Table 12. A summary of the successes and the drawbacks from the Enterprise Architecture and Delphi methods**

Enterprise Architecture	Delphi method
<b>Successes</b>	
<p>Based on integrating human judgement into scientific processes</p> <p>Responses are collected in a standardised way.</p> <p>All the data gathered during consultation is validated by the respective stakeholder.</p> <p>The EA provides a holistic view on a situation. It provides a format for recording information that would otherwise be unavailable.</p> <p>Provides a unique opportunity to record information with high levels of transparency. It pools together a large volume of information on the structure and processes of a business.</p> <p>The EA has the ability to dilute the scientific information when presenting the activity to stakeholders. This is because group discussions provide more flexibility in the delivery method, and can be suited to the needs or level of the stakeholder (OECD 2004).</p> <p>No assumptions made about the activities, processes and types of information applied by the stakeholder.</p> <p>Stakeholders feel involved in the research, and helps ensure ownership of the new management tools. Thus, actually increases the chance of the tools developed actually being used in real situations (Baran and Jantunen 2004). Stakeholders also become partners in the development of solutions (OECD 2005)</p> <p>The data is processed into an automated information system as opposed to traditional manual or informal systems. This</p>	<p>Based on integrating human judgement into scientific processes</p> <p>Responses are collected in a standardised way.</p> <p>All the data gathered during consultation is validated by the experts.</p> <p>Delphi method provides an objective way to explore issues that require some form of expert judgement (Gordon 1994).</p> <p>The Delphi method can obtain reliable group opinion and can easily identify where the similarities and the differences occur (Gordon 1994)</p> <p>Delphi method facilitates group communication among a panel of geographically dispersed experts (<a href="http://www.iit.edu/~it/delphi.html">http://www.iit.edu/~it/delphi.html</a>).</p> <p>The purpose of the stakeholder consultation is clearly stated at the start of the questionnaire (Bryson 2004).</p> <p>Careful selection is given to the wording used, the way of addressing the participants, and the exact questions presented to the experts.</p> <p>The information is automatically synthesized in a questionnaire format.</p>

<p>helps describe complex situations for a decision support system (Ribeiro et al. 2004).</p> <p>The EA method can help stakeholders and policy makers foresee the consequences of their decisions, and help take into account any possible conflicts of interest (Baran and Jantunen 2004)</p> <p>Opens up an opportunity to strengthen ties for future partnerships between monitors and stakeholders.</p>	<p>The Delphi method uses questionnaires sent by mail, which can deliver results relatively quickly and cheaply.</p> <p>Anonymity is encouraged to avoid individual biases that may arise in group discussions (<a href="http://www.iit.edu/~it/delphi.html">http://www.iit.edu/~it/delphi.html</a>)</p>
<p>Drawbacks</p>	
<p>The outcome of the research using EA is highly dependent on the monitors' interpersonal skills or engagement; any deficiencies in their approach will be highlighted in the results (EPA 2001)</p> <p>There are problems associated with group discussions (EPA 2001). For instance, the first meeting with the panel of stakeholders may result in distrust and open criticisms. They may not understand the necessities of the exercise; i.e. they may need to know what is in it for them, why has this work not been done before, why waste time with something they don't understand will help them when they could be getting on with their work. Monitors must be effective at defending their work and prevent the perception of stakeholders from devaluing the activity.</p> <p>The EA is time consuming. Monitors need to travel to each meeting (unless agreed otherwise), and the data collection may require more than one meeting. Interviews can generate large amounts of data that can take a lot of time to analyse and process.</p>	<p>The monitors must be careful in selecting their stakeholders. If they prove to be ineffective, the problem then lies in the selection of stakeholders rather than the validity of the activity itself.</p> <p>The Delphi has been criticised as being 'unscientific' and based only on opinion. The results of the Delphi process are only as valid as the opinions of the experts who made up the panel (<a href="http://www.iit.edu/~it/delphi.html">http://www.iit.edu/~it/delphi.html</a>)</p> <p>Questionnaires must be standardised and have to be carefully scripted to avoid missing vital information. Participants may misinterpret questions (Gordon 1994).</p> <p>A Delphi process can take three to four months including analysis and preparation. Some participants will drop out during the process (Gordon 1994)</p> <p>The Delphi results can be manipulated by the people running the study (Landeta 2006)</p>



## 5.2 Concluding remarks

Historically, the fields of science have always continually readdressed their approaches and their queries in accordance with the new technologies or tools available to address pending issues, such as climate change. The complexity of Mediterranean ecosystem management presents a challenge to experts on a variety of disciplines ranging from natural resources inventory to management planning and policy making (Ribeiro et al. 2005). The need to develop much more sophisticated approaches to help understand human behaviour and human input in resource management is of utmost importance for safeguarding natural resources. The proposed framework of the Enterprise Architecture may be used to help confront this challenge.

The Enterprise Architecture method provides a unique opportunity for data acquisition on the different types of decision making and translates it to computer information systems. The development of an automated information system, as opposed to traditional manual system or an informal system, is seen as a necessity both for efficiency and for effectiveness of data processing, information production and knowledge generation (Ribeiro et al. 2005).

As shown in Table 12, there are both positive and negative aspects to consultation processes. The ones highlighted for the Enterprise Architecture should be carefully considered during its application and in the analysis of results. Each consultation method should be carefully adapted to the needs of the investigation in question. For the purpose of this investigation, the Enterprise Architecture framework is seen to be very adept at integrating a complex situation into decisions support models.

To the author's knowledge, this is the first data quality framework of its kind proposed for ecosystem management plan. Hopefully, it will provide a basis for further studies on incorporating stakeholder expertise data and contribute to increase the fitness of data for better-decision making.

## 6. Future Collaboration with host institution

This document presents the first stage of a partnership between EFIMED and ISA for modelling forest management and enhancing decision support systems in the Mediterranean under the framework of the MOTIVE project.

## 6. Acknowledgements

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## 8. Glossary of terms

<b>ACHAR</b>	Associação de Agricultores de Charneca (Farmers' Association of Charneca)
<b>AFN</b>	National Forest Authority
<b>Altri group.</b>	A European level business focused on producing pulp from Eucalypt and forest management planning.
<b>AP</b>	Area Protegida (Protection Area)
<b>ARH Tejo</b>	Administração de Região Hidrográfica do Tejo (Administration of the Hydrological Region of Tejo)
<b>BETA</b>	Forest Service Provider
<b>CAOFA</b>	Cooperativa de Ahorro y Créditos de los Oficiales de las Fuerzas Armadas (Saving and Credit Cooperative of the Armed Forces)
<b>CAP</b>	Confederação dos Agricultores de Portugal (Confederation of Farmers in Portugal)
<b>CCDRAL</b>	Comissão de coordenação e desenvolvimento regional do Alentejo (Coordination and development regional Commission for Alentejo)

<b>CCDR-LVT</b>	Comissão de coordenação e desenvolvimento regional de Lisboa e Vale do Tejo (Coordination and development regional Commission for Lisbon and the Tejo Valley)
<b>CDOS</b>	Centro Distrital de Operações de Socorro (Central District for Emergency Operations)
<b>CIMDFCI</b>	Comissão Inter Municipal de Defesa Floresta Inter-Municipal Commission for Forest Defense)
<b>DFCI</b>	Defesa da Florestal Contra Incêndios (Defense Against Forest Fires)
<b>DRA</b>	Direcções Regionais de Agricultura
<b>EA</b>	Enterprise Architecture
<b>EPF</b>	Forest Protection Team
<b>Forum</b>	Federal structure of Forestry in Portugal
<b>GIS</b>	Geographical Information System
<b>GNR</b>	Guarda Nacional Republicana (National Republican Guard)
<b>GTF</b>	Gabinete Técnico Florestal (The Technical Forestry Cabinet)
<b>ICNB</b>	Instituto da Conservação da Natureza e da Biodiversidade (Institute for the Conservation of Nature and Biodiversity)
<b>IFAP</b>	Instituto Financiamento da Agricultura e Pescas (Financial Institute for Agriculture and Fisheries)
<b>PDM</b>	Plano Director Municipal (Municipal Director's Plan)
<b>PMDFCI</b>	Inter-Municipal Plan of Defence Against Forest Fires
<b>POIM</b>	Inter-Municipal Operation Plan
<b>POG</b>	Management Orientation Plan
<b>Portucel-Soporcel Group</b>	Pulp and Paper Industry
<b>PROF</b>	Planos Regionais de Ordenamento Florestal (Regional Plans for Forest Management)
<b>RAN</b>	Reserva Agrícola Nacional (National Agriculture Fund)
<b>REN</b>	Reserva Ecológica Nacional (National Ecology Fund)
<b>RPU</b>	Regiment De Pagamento Único (Single Payment Scheme)

<b>Silvicaima</b>	Forestry Society Caima
<b>SIGO</b>	GIS Office
<b>SEPNA</b>	Serviço de Protecção da Natureza e do Ambiente (Protection Service for Nature and the Environment)
<b>VOCC</b>	Operational Control and Communication Vehicle
<b>UNAC</b>	União da Floresta Mediterrânica (Mediterranean Forestry Union)
<b>WWF</b>	World Wildlife Fund
<b>ZIFs</b>	Forest Interest Zones
<b>ZPE</b>	Zone Protecção Especial (Special Protection Zones)