

Integration experiences in forest fire prevention & protection: The Chilean experience & its international projection

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Abstract

In the 8th region called Bío Bío of Chile, is the highest concentration of forestry plantations. In 1991 a new method to manage the fire protection is created through the Protection Societies.

It is in this year that the companies Forestal Chile S.A. and Forestal Bío Bío S.A. decide to establish cooperative resources and integrate it's organizations for fire protection, with the purpose to reduce the cost of fire fighting and prevention, and increase the efficiency of fire defense mechanisms. On a later date Forestal Millalemu S.A. was incorporated and the organization was renamed Sociedad de Protección del Bío Bío.

The evaluation of this society was based on a strategic analysis of the strengths and weaknesses, and on scenarios of opportunities and threats on the project. On the other hand, criteria and rules were established respect of the financing, dispatch decisions, and calculation of the value of resources. Activities that were integrated included the following, prevention, operations center, detection, radio communications, combat resources, management information systems and development projects.

The success of the society, motivated the creation of organizations of the same type in other regions of the country (9th Region – Sociedad de Protección de la Araucanía, 10th Region – Sociedad de Protección de Los Lagos), where the forestry service of Chile (Corporación Nacional Forestal- CONAF) was incorporated. The involvement of the CONAF has been fundamental, because of the responsibility it carries in the protection of small and medium rural developers.

Today the role of these societies has been extended to the sale of services, incorporating the protection of other owners and developers whose capacity of protection is minimal or nonexistent or do not count on technical or economical expertise to self protect themselves.

Chile's experience has had an international projection. Such is the case of Portugal, where under the same concepts and methodology, the companies Aliança Florestal, from the Portucel-Soporcel group; Celbi from the StoraEnso group and Silvicaima from the Cofina group, created in 2002, a Agrupamiento Complementar de Empresas denominatd AFOCELCA, whose main objective is to control de protection of their forests in a integrated and cooperative effort.

In its first year of operation, AFOCELCA, had the support of a mission composed by 14 Chilean personnel (supervisors and firefighters) that worked to train the Portuguese firefighters. In this first stage, it was considered a priority to support the attack of fires on properties of the associated companies as well as private property under a close working relationship with related

institutions, such as the national service of firemen (Servicio Nacional de Bomberos), forestry management (Dirección General de Forestas), municipalities, universities, etc.

These experiences can be used as examples for many countries, regions, locations that irrelevant of the size of property, type of vegetation, ownership of land, it is possible to increase the control of fire protection of forests, without increasing costs, but actually lowering them.

Introduction

The forest fires constitute without a doubt a complex matter anywhere in the world to approach, due to the difficulty of their prognoses, the great variability of their behavior and particularly because they affect without distinction diverse types of vegetation and proprietors or administrators of forest territories or wild areas. In the present paper the experience of Chile in the matter of interchange of experiences, mechanisms of coordination is detailed and integration for the protection against forest fires, the way a group of forest companies of the private sector approached the subject and as this experience is being applied to a international level now, particularly by a group of forest companies in Portugal.

Background

Before starting, it would be proper to have a brief background on Chile and particularly on the protection against forest fires.

Location and Characteristics

Chile is located in the south-western part of South America, extending in the Antarctic Continent and reaching to Easter Island in Polynesia. Its population is approximately 15 million inhabitants who live mainly in large cities like Santiago, Valparaiso and Concepcion

It's geography is characterized by manifest contrast and diversity. While in the north the climate conditions the existence of the most barren desert of the world - Atacama -, in the center and the south of Chile there are multiple green valleys that feed with their fruits and vegetables the population and great international markets, to continue towards the south with great extensions of natural and artificial forests, the presence of Great Lakes and volcanoes, to finish in the South with zones of permanent ice, like the Campos de Hielo Sur and the Antarctic territory.

45% of the Chilean territory corresponds to grounds of preferably forest aptitude, where the forests cover a surface of 15.6 million hectares, which represents 20.7% of the surface of the national territory. In the rest, the deserts predominate (naked areas), with 32.7% and the prairies and scrubs, with 27,1%. The native forests cover in Chile an approximated surface of 13.4 million hectares, which represents 17.8% of the surface of the national territory. In as much, the forest plantations, mainly of Radiata Pine and species of Eucalyptus, include a surface close to the 2.1 million hectares equivalent to 2.8% of the surface of the national territory.

The growth of the forest sector plays a fundamental role in the economy of the country, participating with 2.7% of the gross internal product, being the second most important economic

activity of Chile, after mining. At the moment, forestry exports reach US\$ 2,000 million, which represents 11% of the exported total. To this resource an important industrial patrimony conformed by cellulose plants is associated to, sawmills, plants of boards, parts and pieces of furniture, among others. The occupation in the forest sector approximately reaches to 130,000 direct and 200,000 indirect ones.

The Protection Against Fires in Chile

Vulnerable area to fires

In Chile, there is a surface considered in 40 million hectares susceptible of being affected by forest fires, what corresponds to 53 % of the national surface, of which 35 million are private properties being the rest fiscal properties, national parks and protected wild areas.

General statistics

Annually 6000 fires take place, these affect a average surface of 50,000 Ha. of which 19 % are Plantations, 47 % Prairies and Scrub, 25 % Native forest and 9 % other lands, causing a damage considered to be 50 million dollars. Also they have summoned up the life of 37 people between firefighters, pilots and rural residents.

In relation to the causes of fires, practically 99% of the occurrence are by human causes, emphasizing negligence with an intentional 32% with a 38% and the fire use with 10 %.

The annual cost in protection ascends to the 20 million dollars, of which 14 are contributed by the private sector through the main forest companies and the other 6 million dollars are contributed by the state, specially through the National Forest Corporation (CONAF).

Brief history of the protection against Fires in Chile

At the beginning of the 60's, the subject of forest fires was attacked by different state organisms in charge of control of forest fires. An important technical landmark was constituted by the formulation of the first National Plan of Protection against Forest Fires in 1967 that allowed during the decade of the 70's a national program of Forest fire control that was very effective and well implemented.

Nevertheless, the creation of National Forest Corporation CONAF in 1972 is very important since it established between it's main functions to protect against forest fires and organize the Program of Protection, that later and until nowadays is called Fire Management Program. In years 1972-73 an important impulse through the implementation of brigades was registered and soon the transcendental decision to professionalize the brigades of protection against fires was taken.

By the end of the 70's some located forestry companies in the VIII region of the country, began to develop their own programs of protection mainly, motivated by the explosive expansion of the surface of plantations created under the shelter of the Decree Law 701 on promotion of the forest

plantations and because he conception that the responsibility of the protection was inherent to the property.

This situation changed nevertheless, as of 1979 with the CONAF decided to transfer definitively to the private sector, the protection of its own forest resources and maintaining for themselves only a subsidiary roll respect to the forest proprietors without economic or technical capacity to make the forest protection. Of course it maintained the responsibility to protect fiscal lands, the protected wild areas, and the national parks.

From this point, many companies were in the necessity to improve and to implement their own programs of protection and they began to establish the first agreements of collaboration and coordination between private companies and the National Forest Corporation (CONAF).

Later, as of the decade of the 80, the development of the programs of protection of private companies with the allocation of physical and economical resources that surpassed with amplitude those assigned by the state to the National Forest Corporation (CONAF).

Finally, in the 90's, and because of the significant increase of protection costs that began to hit strongly on the profit of the forest business, and in consideration that forest fires do not respect limits of property, causing great enormous economic losses, some deprived forest companies, decide to integrate their programs of protection with the intention of reducing the protection costs and of increasing effectiveness to themselves in prevention, detection and control of forest fires, giving origin to the Societies of Protection.

At the moment the protection against fires is of two agents; the state through the National Forest Corporation (CONAF), and on the other hand the great agent of Protection constitutes the private sector, mainly the forest companies.

Experiences of Association Worthy to Mention

It is important and advisable to make a brief reference about the experiences of well-known integration and reciprocal cooperation, because they can be useful to understand the foundations of the strategic decision taken by the companies in the occasion of the creation of the Societies of Protection in Chile

Agreements of Protection

As has been reviewed in the history of the protection of Chile, there were three types of protection agreements established:

- a) Agreements of Coordination: in that fundamentally an exchange of information.
- b) Agreements of Collaboration: through these mechanisms and conditions are settled to interchange resources
- c) Joint Programs: this is an agreement modality that constituted the maximum expression of reciprocal collaboration.

Experiences of Other Countries

The experience of the U.S.A. with the Interagency cooperation and especially the Canadian Experience with the Societies of Conservation in the province of Quebec provided the most interesting experiences used by the Chilean private companies

Association for the Protection in Chile

In Chile, in the VIII Region of Bío Bío where the main private companies of forest plantations of the country are concentrated, in 1991 a new modality to manage the protection of the forests against the forest fires was begun, that surpassed the economic barrier that the companies in the different scopes of the forest business maintained.

There were many regional resources at that time, which from the global perspective, represented a great irrationality and evident inefficiencies, since there was the presence of brigades or towers in very close areas that overlapped each other.

It must be indicated also that in that opportunity, a strong pressure on the part of the shareholders of the companies was demonstrated, to reduce the costs of protection. The protection cost is also argued that, in fact constitutes a cost that does not contribute to the increase of the value of the forest and, that therefore the greater interest of the managers is that this amount tends to diminish substantially.

It is in this complex scene where the companies Forestal Chile S.A.(Arauco group) and Forestal Bío Bío S.A. show their intention to establish cooperative resources and to integrate their organizations of protection against forest fires; Later Forestal Millalemu S.A. was incorporated and the organization was denominated "Society of Protection of the Bío Bío" due to that its area of action corresponded to the Region of Bío Bío.

Creation of the Society of the Bío Bío

Objectives: The creation of this society had the objectives to Reduce the costs of protection and Increase the efficiency of management

Activities to integrate: Previous to the analysis of these integration activities and to have perfect clarity of what it was possible to do in this matter, without the companies losing their identity, or had the sensation of loss (normal behavior between people) there were defined different degrees of integration:

Coordination: was defined as that degree of participation in which any company or organization made in independent form, from a technical and economic point of view, any activity and it only informed to the other companies on his intentions.

Combined-forces operation: It was defined by those activities that each company could make according to a common technical criterion, but with independent financial resources according to its own necessity or interest and would allow him a different degree of intensity in their actions.

Integrated operation: This was defined as the greatest degree of integration than could be reached and after which the activities to be conducted in a common territory technically would be decided between the parts, and established a common financing.

Next a listing of all the activities that each one of the companies internally executed in their respective programs of protection and soon these activities were defined technically with the purpose of establishing similarities and/or differences between each other.

These activities were grouped according to the essential elements that compose a classic program of protection, concluding that except for small exceptions the activities were the same ones therefore all of them could be led in a integrated form.

This led to activities like fire detection, control centers, radio communications, the combat, information systems and schemes of development education and diffusion for the prevention of fires were activities perfectly possible to combine in a integrated manner financed from a common budget.

Strategic analysis: The strategic analysis was based on evaluation of strengths, weaknesses, risks and opportunities of the project, according to the following points:

Strengths: The fact that the location of a important proportion of the plantations of the three companies was located in common territories; Companies, their executives and directors had a common set of criteria to face the subject of forest fires, and the similar contribution of specialized professionals with experience in the matter.

Weaknesses: Lack of previous experience in the matter of total integration; The existence of some plantations in non common zones; The difference of styles and types of general organization of the companies, and that says relation with the own administration, types of individual management, characteristics of its personnel, everything which affects diverse aspects of the operations; and Different criteria for forests valuation that could affect the protection priorities.

Opportunities: Increase of the capacity and cover of the resources available in a joint form; To have a greater back up to control fires; Reduce of individual costs of protection that for each of the companies in individual form; and All the previous one were translated into the real opportunity to diminish the costs of protection and of increasing the efficiency in management.

Risks: The permanent reality of simultaneous fire occurrence affecting properties of different companies; The previous translated in the risk of existing conflicts by different interests

Common essential criteria: Between the fundamental elements that sustain the Society, it is possible to emphasize to the criteria of financing, dispatch of resources and some concepts or premises that allow to support their correct operation.

Financing: In the first year of operation a criterion of proportional contributions was applied to the original budgets of the companies, that is to say if a company spent 400 thousand dollars and other 600 thousands, this corresponded respectively to a participation of 40 and 60%, proportions that were applied to the new joint budget that turned out to be 800 thousand dollars.

Later, and with the intention of making the participation equitable of each of the members of the society and, with the later inclusion of a third company, it was modified, using a modality that is used until nowadays and that is made up of three parts:

A fixed cost equivalent to 15% of the total cost of the program that is divided by the total number of companies that participate.

A component equivalent to 50% of the total cost to be divided in quotas by company in proportional form to the forest surface declared by each one of the participant companies that must be protected by the Society.

A variable component, equivalent to 35% of the total cost of the program that has been denominated "risk" and that is measured according to the proportion of use of resources for the combat. In this way, if a company uses more resources, it is understood that it has greater risk and therefore this condition would have to be reflected in the contributions.

Dispatch of resources: For the effects of dispatch of resources for the combat of fires, the criteria that have been accepted as essential for the operation of the society are the following ones:

Times of arrival: the units must arrive at the fire in the smallest possible time, independent of the type of unit or means used of mobilization

Massive initial attack or unique Blow: It consists of dispatching all the resources necessary to assure the control and total extinction of fires in the first attack and when these still are incipient.

Simultaneous fires: Because of the possibility of simultaneous fire occurrence that could affect one or more members of the society the criterion of protection priorities agreed to by calculating the potential danger or probabilities of propagation, and the expressed potential damage through the economic value of the resource, values all calculated previously and available in the information systems of the operations dispatch centers

The criteria times of arrival and massive initial attack manage to solve most the problems that appear, since often the resources that are being used in a fire are dispatched to control a incipient fire and after controlling it return to the original fire.

Fundamental Concepts: Finally, and like one of the three pillars that sustain the society, the companies consider important to reinforce the following concepts:

Conviction: in order to work together the partners must believe and be convinced of it, in the sense that this option can satisfy better its requirements.

Trust: without a doubt that this one is basic element which sustains any associate action. The trust must be reciprocal and is a value that allows the continuity of the organization.

Decision: the actions that must be undertaken whatever their nature, require to be assumed with decision, courage and resolve, in a opportune form and with the corresponding argumentation.

Participation: all the partners, independent in their size or its financial contribution, must participate in identical conditions of responsibility, since the success or the failure of the society, depends on all.

Motivation: the interest of the associate to fulfill the objectives of the society is another aspect fundamental to ensure the success the organization.

Solidarity: this one is a value that can be subjective, nevertheless has been considered important to establish like fundamental, to reiterate that the success or failure in the physical results for some of the partners in individual is also the success or failure of the society as a whole.

Operative organization: The operative organization of the society is established in three levels:

A level called command. Which is conformed by the technical representatives of the three companies associated that in this case correspond to the Heads of Protection of each company.

A second level, dependant of the command level, which corresponds to the functions of technical secretariat and that supervises the activities of the command center

Finally, a third level represented by all the external services that constitute the units that execute the basic operations of the program.

All the activities are executed through outsourcing services, using specialized services such as combat services, airships, detection, transport and services of feeding and radio communications.

Obtained results

As far as the results related to the objectives of the society, the effective reduction of the costs of protection in a proportion of near 20% respect to the individually obtained original costs by each company.

In terms of the physical results or increase of the efficiency, that corresponds to the second objective of the society, they managed to improve the standards of time of arrival to fires and

obtained an optimization of the detection system and improvement in the information systems available for the decision making, allowing access to technologies that in individual form the companies could not accede due to their high cost. All this is translated finally in a smaller surface affected by fires.

National projection of the experience

The success of this new organization, motivated the creation of organizations of the same type in other regions of the country where the state of Chile was involved, through the National Forest Corporation CONAF, and were born the Societies of Protection of the Araucanía and the Society of Protection of the Lakes in regions IX and X respectively, where with similar analyses but with different types of integration they have associated the state with small, medium and big companies and forest owners.

At the moment the Societies of the Bío Bío protects a surface of plantations of 151.700 há. of the Araucanía with a surface under protection of 326.500 há., principally wild land areas , and of the Lakes with an area under protection of 125.700 há. , of plantation.

All these societies, not only protect the plantations and forests of companies or associated members, but that also through the sale of services, have extended their management incorporating the protection of and small companies or private proprietors whose capacity of management is little or do not have the economic or technical means to protect their forests.

All these organizations, which already are consolidated from the technical and operational point of view, need to advance to the following step that is the legal consolidation and constitute thus in right societies that allow them to have greater independence, to accede to governmental funds that allow for research end development.

Projection the International of the Chilean experience.

The experience of Chile has had an international projection in Europe, particularly in Portugal, country which has an important extension of forests and enormous damages caused by forest fires.

In this country, the companies Aliança Florestal S.A. of the group Portucel-Soporcel, Celbi S.A., of the group StoraEnso, y Silvicaima S.A. of the Caima group, decided to establish a group to complement themselves. This “Agrupamiento Complementar de Empresas” is a type of association, where groups of physical or legal people join themselves to improve their financial results and to obtain benefits of their economic activities. These associations are constituted like an independent society, by means of public deed and are very frequent in Portugal.

In this case, the “Agrupamiento Complementar de Empresas” is called AFOCELCA, and its objective is to manage the protection of its forests in an associate or integrated form and its high priority mission it is the prevention, detection and it also the combat s of fires in the properties of the grouped companies and in the neighboring properties in narrow collaboration and coordination with the Firemen, who have the legal responsibility to fight forest fires in Portugal.

For the establishment of this association, concepts and methods of analyses that were used in Chile were taken into account, that is to say, an analysis of strengths, weaknesses, opportunities and risks; On the other hand the technical criteria of performance based on the reduction of the time of arrival to fires, the massive initial attack and the priorities of protection based on danger of propagation and the potential damage (economic value).

The statutes of operation of the indicate: General dispositions likes Objectives and Participation of the companies; Rights and Obligations: likes Contributions and Responsibilities; Structure of the Members of the Agrupamento: General Assembly and Deliberations; Administration and Control: Board of Administration?, and Final Dispositions

The scope of AFOCELCA, in his first stage is: To plan the campaigns of prevention, monitoring, alerts, fights and extinction of forest fires; To lead the hiring of resources and materials and to control the operations; To promote the conception and development of suitable information systems; and To develop and to promote cooperation with institutions related to the subject (Bombeiros, Counties, regional Main directorate of Florestal, Direcciones of Agriculture, Universities, etc.).

Respect to the organization, AFOCELCA, has a board of administration conformed by the 3 administrators or directors of the grouped companies and whose function is to define the general policies. A external board member is in charge of the administration of resources and command and control, and a Technical Board conformed by the technical representatives of the companies and whose function is to technically support the work of the Executive Director.

All the services of personnel, brigades, radio communications, airships and others are contracted through the modality of external services or outsourcing

In its first year of operation AFOCELCA, counted on the support of a mission composed by 14 Chilean technicians between supervisors and combatants who worked in the formation and qualification of Portuguese firefighters, work that will be continued of the same form during campaign 2003.

Conclusions

These experiences can serve as example for many countries, regions or localities where independent of the size of the properties, type of vegetation and regime of ownership of the land, the management of protection of the forests can be improved, without increasing the costs and even of obtaining a diminution of such.