

Forest Fire Prevention In Urban-Rural Interface In Central Zone Of Chile - Valparaiso Region

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Abstract

INTRODUCTION

In the cities of the Valparaíso Region, especially in Valparaíso, Viña del Mar, Quilpué and Villa Alemana, there is no intermediate area between the cities and the forest zone, as in the case of the agricultural lands to avoid people to pass through freely from the cities to the forest zone and to prevent forest fires advancing to the periphery of the cities.

Therefore forest fires generate three main problems:

Forestry: when forest fire starts and only affects the forest resources.

Social: when not-controlled forest fires affect houses, health and people's life.

Public Order: when the forest fire, invade population area affecting the normal operation of cities.

The Chilean Forestry Service (CONAF) designed the Forest Fire Integral Prevention Program for the Interface Area, with the following actions:

Education:

In their formal conception, adapting the environmental and forest topics to the Chilean General Basic Education Programme.

In their informal conception, involving the teacher's work and incorporating the pupil's family.

Fuel Management:

Basically, eliminating fuel near to houses and other belongings.

Police Control:

There is a population's segment represented by delinquents and drug addicts that are not conscious with the previous activities and they must be controlled with coercive or punitive actions by Police.

A. FORMAL EDUCATION

FOREST ENVIRONMENTAL EDUCATION

It is recognized that Formal Education is the best alternative that could help to form people's behaviours making them more conservative and protective. Naturally, this is not easy, we have so much to say, and demonstrate, to change the behaviour of the human beings.

To do this, it is used the best agent of efficient change, THE CHILD. To communicate with him, we necessarily have to make it through their TEACHER, at school.

Our proposal is to impart Forest Environmental Education to all Chilean General Basic Education Schools of the region.

The Forest Environmental Education Project prepared jointly by the Regional Secretary of the Ministry of Education and the Chilean Forestry Service has been experimentally applied during 1983 and 1984 in 25 schools.

This initiative was reformulated in 1997 and it is applying currently since 1998.

Contents

Systematic education.
Outdoors Education.
Education to Parents and the Community.

Monitoring and Evaluation

Educational staff and Forestry Specialists supervise and carry out the monitoring of the teacher's work.

Training

Since 1998, each year teachers are trained as monitors and coordinators for the application of the project at school. The qualified teachers obtain the recognition of the C.P.E.I.P. (Educational Improvement and Pedagogic Investigations Center of the Ministry of Education).

Implementation

The Teacher's training consists in 120 chronological hours, 48 present hours and 72 in the project development; it considers handbooks for the teachers and ludic books for students of the basic level.

POLICE CONTROL

The work is carried out by the Police in urban-rural interface area, in the control of young and adults with problems of delinquency and drug addiction.

DEVELOPMENT, BUDGET AND RESULTS

This topics will be treated in the conference.

FOREST FIRES PREVENTION IN URBAN-RURAL INTERFACE IN CENTRAL ZONE OF CHILE - VALPARAISO REGION

I Introduction

In the Region of Valparaíso, Central Chile, forest fires represent the most important effect on the loss of the renewable natural resources and the main factor causing desertification processes. These fires are caused accidentally or intentionally by humans and they have become a routine in the daily life especially in summer time.

All kind of initiatives focused on conservation and protection of these essential resources should be an output of jointed efforts of public, private and community organizations, and these institutions should be the principal entities in formulating and executing the work tending to prevent the occurrence of the most harmful agent in the nature: the FOREST FIRE.

Also, it is important to emphasize that in the cities of the Valparaíso Region, especially Valparaíso, Viña del Mar, Quilpué and Villa Alemana cities, there is no intermediate or “buffer” area between the cities and towns and forest lands like in the case of agricultural sector, which could prevent people to traffic freely from one side to another, and serve as a barrier to the advance of forest fires into the periphery of population centers.

Due to this situation forest fires provoke three great problems:

- Forest problem : a forest fire affecting only to forest resources
- Social problem : when forest fires have an effect on goods, health and welfare of human beings.
- Public Order problem: the fire invades population areas affecting normal operations of cities and towns.

At as the end off 1997, la Corporación Nacional Forestal-CONAF, the Chilean Forest Service has designed the Forest Fire Integral Prevention Program for the interface zone of urban – rural sector with the following actions:

- Education, both formal and informal
- Fuel management
- Police surveillance

II Description of Projects

A. Formal education

1. Introduction

“The firebreaks that will stop the forest fires finally will have to build it in the mind of each one of the inhabitants of this earth.” Gifford Pinchot. This American conservationist’s famous sentence is so good that we cannot forget it at the moment of introducing our proposal to reduce forest fires’ problems, and through this statement we pretend to create awareness for people to know exactly what is the meaning of this problem and how it affects us, no matter the place where we live, whether if we are owners of forest lands or not, and how its consequences will damage future generations.

That is the reason of our responsibility: to teach to the children and young people very clear concepts about “renewable natural resources”, and its importance of wise management and use, for those next generations of human beings be able to adopt attitudes and desirable behaviours for the conservation, protection and respect of these important resources for the LIFE.

This is not an easy task of course, there is so much to say and show to change an adverse conduct of people towards renewable natural resources and of the forest ones in particular. This is a hard work and it is not free of difficulties, but not impossible to achieve if we used the more efficient agent of change: THE CHILD. But for a communication with the children and for this purpose, we have to do this necessarily with their Teacher at school, the place where the process of child’s integral formation begins.

Therefore it is recognized Formal Education as the best tool to help us to form behaviours in the children, desirable for the conservation and protection of forest resources, diminishing consequently the occurrence and damage of forest fires.

So the proposal consists on imparting FOREST ENVIRONMENTAL EDUCATION in almost all the Elementary Schools in the Region of Valparaíso, as it is proposed in the Project prepared by CONAF and the Regional Secretary of Education. This Project has restarted from 1998.

2. Background

Education is indubitably the discipline through which society promotes its values, interests and objectives with more strength and fixation; it is the most appropriate tool because it presents particular characteristics comparing with other systems of diffusion and information, as for this seems to be the only one that is universal, systematic and mandatory in great number of its degrees.

Also, education has logical and psychological connotations that make it more appropriate for the communication of habits and affective links, that is to say, mainly formative.

These characteristics make it to be the best system to achieve changes of conduct in the population and as a consequence, a desirable behaviour according to the objectives of conservation of the environment and prevention of forest fires that the State of Chile has among its aims through the CONAF.

3. Participants

3.1. Regional Secretary of Education

- 3.2. CONAF
- 3.3. Municipalities

4. Description

Formal Education provides methods and educational techniques applied in the Pilot Plan and its re-adaptation processes to the transversal objectives of Plans and Programs for Elementary Education. It includes the design of a Forest Environmental Education Project to be applied in each school focusing the attention on the more interesting topics according to the reality of the environment surrounding the schools.

4.1. Guidelines of Action

a) Systematic education

This is the education delivered in classrooms based on ludic activities (for 1st to 3rd grade) and on the development and application of learning units (for 4th at 8th grade).

b) Outdoors education

Practical application of the contents developed in classrooms.

c) Education to Parents and Representatives

During the meetings of Parents and Representatives information and talks about teaching that the children and/or pupils receive will be delivered.

5. Objectives

5.1. General

To contribute to the defence of the renewable natural resources, especially of the forest resources, from the destructive action of fire, achieving a change of the population's behaviour pointed towards their conservation and protection.

5.2 Specific

- a) To incorporate the student community of Elementary Education to an internalisation and understanding process of the forest resource, their benefits and people's compromise with it.
- b) To achieve through the education, a reduction of the occurrence and damage of forest fires.

6. Program

6.1 Systematic education 1st to 3rd Grade

- a) Graphic individual modules including the following activities: complete, paint, cut, identify, select, fold, assemble, games, etc.

All the graphic elements are represented by figures related with the renewable natural resources with emphasis on the forest resources.

6.1. Systematic education 4th to 8th Grade

- a) Air – Soil – Water – Plants
- b) Forest resources
- c) Forest fires

6.2. Outdoors Environmental Education

- Observations in the field about topics learned in classrooms.

6.4. Informative meetings for Parents and Representatives

- General information about the participation of the children in the Forest Environmental Education Project.
- Participation of the community in forest fires prevention works.
- Rules and regulations about fire use.

7. Project goals

- To incorporate Forest Environmental Education to 400 schools of the Elementary Education in a 10-year period.
- To apply the Forest Environmental Education Project from 1st to 8th grade
- To incorporate 40 schools per year.
- To qualify 40 teachers/year as coordinators of the Project in the school.

8. Implementation of the Project

8.1. Regional commission

Integrated by specialists on educational planning of the Regional Secretary of Education and CONAF, this latter having the responsibility of conducting its execution and carrying out the necessary adaptations as a consequence of the monitoring and evaluation.

8.2. Selecting Schools and Coordinating Teachers

The criteria to select schools are based on the dispersion of occurrence of forest fires. According to this the province is selected first, then the communes and finally the sector.

The School Headmaster designates the Teacher considering as a fundamental requirement the voluntary disposition and interest to work in the project. The Teacher has the responsibility of coordinating the execution of the project in the school.

8.3. Training Course

Every year a training course for coordinators of the Project of each selected school is carried out. This course -recognized by the Center of Training and Pedagogic Investigations of the Ministry of Education- has 120 hours duration, 48 of which are presence hours and 72 practical hours, comprising design and application of the project of the Educational Unit.

8.4. Project in the School

Each school will receive from CONAF the necessary didactic material for the application of the Project that each Teacher will design and apply:

- Handbook for the Teacher, for 4th to 8th Grade
- Ludic Book for 1st to 3rd Grade

These documents complemented with the information and teaching materials given to the Teachers during the presence course will allow them to design and apply the Forest Environmental Education Project for each School.

B. Informal education

1. Introduction

During the summertime children are not receiving formative instruction regularly, and this is a critical period because of the occurrence of forest fires. In that moment the informal education is of vital importance, since it basically represents a relevant task to face in order to choose the right time and place where forest fires originate.

Consequently the informal education will supplement and reinforce the concepts learned by the children in the classrooms, and the adults will take on an obligation for preventing forest fires.

2. Background

The occurrence of forest fires is concentrated for the most part on the periphery of the cities of the communes of Valparaíso, Viña del Mar, Quilpué and Villa Alemana, that is to say, Metropolitan Valparaíso.

The inhabitants of these sectors correspond to a low socio-economic stratum having a diffuse perception of forest fires problems, and they only perceive their functional space, such as their home, their work and the way from one place to another.

3. Participants

- CONAF
- Municipalities
- Communities
- The Family

4. Description

The Informal Education will be carried out preferably face to face organizing activities in the same place where the problem of forest fires occur: the periphery of cities and towns or URBAN – RURAL INTERFACE.

4.1. Target people: mainly children, incorporating necessarily young people and adults of peripheral sectors with great incidence in the occurrence of forest fires.

4.2. Media: contact person-to-person, radio broadcasting, newspapers, printed material, talks, etc.

4.3. Strategy of Communication: the communication strategy will be constituted by four (4) independent concepts linked in an iterative and systematic line:

4.3.1. Forest fire: fire that spreads freely and without control in forest lands.

4.3.2. Damage: destruction of vegetation and environment caused by a forest fire and affecting to the human life.

4.3.3. Prevention: set of activities in order to diminish the occurrence of forest fires trying to minimize the damage.

4.3.4. Participation: the active population's attitude to face the problem in the occurrence of forest fires, understanding that directly threatened residents should be the first in developing activities to avoid them.

5. Objectives

5.1. General objective

To strengthen the conservation and protection concepts in the children and to achieve the direct participation of adults in protection actions against forest fires: change of attitude.

5.2. Specific objectives

- a) To achieve that adults have more control of free time of children
- b) To achieve an understanding of four basic concepts: forest fire, damage, prevention and participation.

6. Activities

6.1. Personalized prevention

Motorcyclists patrol defined sectors with the purpose of evaluating critical situations that could become an eventual damage, as much for the forest resource as for the domestic infrastructure.

6.2. Visits to Towns

Visits to some towns and villages considered as critical from the point of view of the occurrence of forest fires during November, December, January and February each year.

The visits will be done in the morning on Saturday and Sunday, and they will be previously advised, getting in contact with the leaders of the community organizations (Neighbours Organizations, Sport Clubs, Youth Clubs, etc.) and encouraging them in order to achieve collaboration to prepare the appropriate environment and concurrence.

Printed material to be delivered in the visits with the preventive legends and the corporative image (Forestín symbol) is:

Posters, leaflets, calendars, books for colouring, notebooks, key rings, pins, pencils, others.

A technician, a Fire Crew and Forestín symbol will accomplish the visits.

6.3. Broadcasting

The broadcasting station of higher rating in the respective areas will be used to announce the population about the visit that CONAF will carry out with Forestín symbol the next weekend.

7. Goals

During each season of forest fires in the period November – February 15.000 people will be directly contacted.

C. Fuel Management Project

1. Introduction

Forest fires have caused direct damage to the population, especially to those located in peri – urban areas containing important vegetation covers very close to the housings. The inadequate localization of the population settlements and the lack of transition areas that minimizes these contacts represent a very vulnerable infrastructure for the propagation of forest fires.

All the situations in which the population was impacted with disasters of considerable losses and the death of people had a constant feature: “THE LACK OF PREPARATION TO FACE FOREST FIRES WITH APROPIATE PREVENTION MEASURES”, such as fuel management.

2. Background

The forest fire is expressed in intensity and magnitude, which involves the participation in more or less degree of factors that determine its behaviour, such as topography, weather conditions and fuels.

The essential activity is the fuel management, and this aspect should be carried out with a lot of anticipation, and finally it will be expressed in a preparatory action before the impact of an event that could be catastrophic.

3. Participant institutions

- CONAF (Technical Advisor)
- Municipalities (Execution of the construction and maintenance of firebreaks)
- Community organizations

4. Description

It deals with the management of fuels as a measure of prevention and reduction of the impact of forest fires, that is to say, to control the danger or susceptibility of the vegetation to the ignition and propagation of fire, through the reorganizing and reduction or interruption of the continuity of forest fuels that are close to the housings.

This work is made preferably in Metropolitan Valparaíso in peri – urban areas where the population has been located in hillsides and adjacent to ravines.

Firebreaks are basically used in all the preset areas and they are supplemented in some cases, -when the slope is very deep or the vegetation is very dense and high-, with fuel breaks to assure the efficiency of firebreaks.

5. Objectives

5.1. General objective

To offer protection to the peripheral population in contact with vegetation covers, in the face of an occurrence of forest fires.

5.2. Specific objectives

To diminish the danger of forest fires in high-priority areas for the protection of the housings and other infrastructures.

6. Activities

6.1. Field trips

The purpose is to evaluate in the field the necessity for managing fuels as preventive measures in the urban – rural periphery giving as a result a requirements report which is sent to the Municipalities. August.

6.2. Fuel management

This work is performed by the municipalities using techniques of firebreaks and fuel breaks basically. September – October – November.

6.3. Evaluation

CONAF is the institution commissioned to evaluate the extent of execution of the Municipalities' work of managing fuels.

7. Goals

150-meter firebreaks

D. Police surveillance

Through the Regular Education Plans, formal education will give critical elements to the children, which allow them to develop a DESIRABLE BEHAVIOR when they are in front of renewable natural resources. On the other hand, the informal education will spread to strengthen the consciousness acquired by the children in the school and it will instruct the adults regarding the necessary cares (to a domestic scale) to accomplish to avoid forest fires.

However, if a forest fire takes place threatening housings or another important infrastructure, fuel management techniques will give the necessary protection to the population, like the construction of firebreaks in the urban periphery.

In spite of all the efforts of previous actions, it is necessary to recognize that an especial population's segment exists and it is represented by criminals, drug addicts and young people without any instruction level who will not be able to sensitize through the education. This social stratum is located geographically in areas of high occurrence of forest fires contributing to a large extent to make worse the problem, since beginning a fire is an expression of their social maladaptation.

Police surveillance is certainly one of the best alternatives to control the attitudes of that segment of socially excluded people in order to diminishing the interference in the expected results, that is to say, to have a good control degree in the occurrence of the intentional fires.

III Costs

Table 1

Cost schedule by project, Formal and Informal Education

Year	Project		TOTAL COSTS US\$
	FORMAL EDUCATION US\$	INFORMAL EDUCATION US\$	
1998	60,000	24,000	84,000
1999	56,604	22,641	79,245
2000	52,356	20,942	73,298
2001	37,220	16,854	54,074
2002	25,442	10,120	35,562
2003	35,551	12,000	47,551
Total	267,173	106,557	373,730

IV Advance

At this moment 214 Elementary Schools have been incorporated to the Forest Environmental Education Project and 264 coordinating Teachers have been trained.

VI Bibliography

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