

WORKBOOK

*CONCEPTUAL AND METHODOLOGICAL
CONTRIBUTIONS*

For the incorporation of Tsunami risk management in the formal
education of the Colombian Pacific Coast

PREPARE FOR A TSUNAMI

SEGUNDA EDICIÓN



Cruz Roja Colombiana

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Colombian Ocean Commission-CCO

Ministry of Interior

Ministry of Justice

**Ministry of National Education
Quality-Environmental Education Program
Address Coverage and Equity**

General Maritime Directorate-DIMAR

Geographic Institute Agustín Codazzi-IGAC

Colombian Institute of Geology and Mining, INGEOMINAS

National Planning Department-DNP

Colombian Red Cross

Seismological Observatory Corporation South West-OSSO

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Editor Second Edition

Comisión Colombiana de Océano

Photo front and back

Playas del Morro. Photo: Marine Biologist Camila Romero Chica

This document was constructed under the project "Adaptive Learning Mechanism for Tsunami Preparedness in Coastal Communities of Colombia, Ecuador, Peru and Chile" by UNESCO with funds from the Disaster Preparedness Program-DIPECHO, Directorate Humanitarian Aid European Commission DG-ECHO, with the permanent support of the Ministry of National Education (Directorate of Quality Promotion Sub-Program Competencies for Environmental Education. Department of Insurance and Equity-Permanence Branch). This document may be summoned at any time, reproduced, translated or adapted to local and regional needs, either in part or in its entirety.

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Aprendizaje
y adaptación frente
a Tsunamis en Ecuador,
Colombia, Perú y Chile

Organization of the United Nations Educational, Scientific and Cultural

Learning and adaptation to Tsunamis in Ecuador, Colombia, Peru and Chile

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Design and print:

Dígitos & Diseños Industria Gráfica Ltda.

Printed in Colombia

2012



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ACRONYMS

“Word formed by the set of initial letters of a complex expression,”
RAE Definition

CCO	Colombian Ocean Commission
CIDEA	Environmental Education Interagency Committee
CLOPAD	Local Committee for the Prevention and Relief
CRC	Colombian Red Cross
CREPAD	Regional Committee for the Prevention and Relief
CTNAT	National Technical Committee for Tsunami Warning
DANE	National Statistics Department
DIMAR	General Maritime Directorate
DIPECHO	Disaster Preparedness Programme EU Commission Humanitarian Office
DGR	Disaster Risk Direction
GdR	Disaster Risk Management
INGEOMINAS	Colombian Institute of Geology and Mining
INVEMAR	Institute of Marine and Coastal Research
MAVDT	Ministry of Environment, Housing and Territorial Development
MEN	Ministry of National Education
ONG	Non-Governmental
PEGR	School Plans Risk Management
PLEC	Local Plan and Emergency Contingency
PNGRT	Plan National Tsunami Risk Management
PNEA	National Environmental Education Policy
PRAE	School Environmental Project
PREDECAN	Support Project Disaster Prevention in the Andean Community
PEI	Institutional Educational Project
SIG	Geographic Information System
SINA	National Environmental System
SNPAD	National Disaster and Prevention System
UNESCO	United Nations Educational, Scientific and Cultural Organization



INTRODUCTION

This *workbook* comes within the framework of *the adaptive learning mechanisms Tsunami preparedness in coastal communities of Colombia, Ecuador, Peru and Chile*, as a contribution to the strengthening of the GdR issue in the educational sector in Colombia, especially in the issue of preparedness for the occurrence of a Tsunami.

The approach and contents presented herein are part of the policy guidelines as a country being consolidated from the SINA and SNPAD and from the incorporation of conceptual and technical approaches PNGRT and of the PNEA.

This workbook is the result of the joint commitment of the institutions of the CTNAT governing body on the subject, why this project is part of the actions undertaken Colombia to strengthen the response capacity of communities and institutions of the Colombian Pacific coast. Also, the book addresses the challenges arising from the PNEA to build a **CULTURE OF MANAGING RISK** in the context of environmental dynamics and environmental education, in the national, regional and local levels.

Based on the political and technical elements described above, the book has three main components: the first component located a series of reflections that allow understanding of the Tsunami phenomenon as the result of the interaction of natural areas, social and cultural are in the basis of territorial development processes, a second component correlates the initial reflections on the particular context of the *Pacific Coast of Colombia* (Tumaco case study) and a third component that raises possibilities of projection of the GdR, the dynamics of educational institutions.

The *workbook*, for the teacher seeks to provide a conceptual framework, contextual and GdR project and environmental education for the Tsunami-depth understanding of the phenomenon and its incorporation into the PEI as an integral process of development transverse to do schoolwork.



PRESENTATION

The CTNAT since its inception has been concerned to provide adequate technical information related to the Tsunami event also for preparing the various entities to address SNPAD a Tsunami on the *Pacific coast of Colombia*, is how in the year 2009 PNGRT consolidates, which determines the functions and actions to be undertaken by each of the members of the system. In 2010, Colombia participated in the development of a regional project on the issue of Tsunami, led by UNESCO with funding from the European Union (DIPECHO), thus strengthening the work that had been developed so far in the educational sector.

Likewise, the National Environmental Education as an instrument of MAVDT articulator and the MEN, as part of SINA seeks "... *strengthening participatory processes, the installation of technical skills and the consolidation of the institutionalization of the projection of environmental education, to build regional horizons and ethical and responsible culture in the sustainable management of the environment*"¹; what the country poses a challenge of interagency and intersectorial coordination to incorporate the environmental dimension in formal education, no formal and informal.

Consistent with this, is through the joint between SINA and SNPAD which aims to advance the incorporation of the GdR in the educational process, not through a lecture or training of isolated processes, but from coordinated actions in a planning process that becomes a transverse process of environmental education in the formation of the Colombian population. That is, the inclusion of the GdR in the educational sector entities to undertake technical and continuing strong support from the national, regional and local levels, updating concepts and implementation of related actions, and the Educational Sector development of methodologies and avenues for curricular integration, enabling a greater understanding of the GdR as an expression and part of the environmental management process for consolidation, generation and/or reconstruction of culture environment for the development of safer, healthier and sustainable.

It is in this context that the project Strengthening Local Capacity for Risk Management, Awareness and Adaptation to Climate Change in the Municipality of San Andrés de Tumaco² presents to teachers in the *Colombian Pacific Coast WORKBOOK CONCEPTUAL AND METHODOLOGY FOR INCORPORATION OF TSUNAMI RISK MANAGEMENT IN THE PROCESS OF FORMAL EDUCATION OF THE COLOMBIAN PACIFIC COAST*, so that it becomes a methodological tool for the management and/or understanding of actions in the environmental context, so that both teachers as students progress in understanding the Tsunami phenomenon from its complex dynamics. These, in response to approaches from the regional level are reflected in regional policy instruments for environmental³ education and GdR.

1. PNEA. General Objective. Page 21.

2. Made in the framework of the Adaptive Learning Mechanisms on Tsunami Preparedness in Coastal Communities of Colombia, Ecuador, Peru and Chile.

3. Ten-Year Plan for Environmental Education in Nariño. Departmental Policy on Environmental Education in the Valle del Cauca. Department of Environmental Education Plan of Cauca.



OBJECTIVES

1.1. General Objective

Provide conceptual, contextual and projection that will enable the different members of the Educational Institutions in the Pacific Region of Colombia, progress in understanding the Tsunami phenomenon since its complexity, to include a cross-cutting theme in the development process training.

1.2. Specific Objectives

- In understanding the phenomenon from its natural dynamics Tsunami, social and cultural, within the framework of territorial development processes, typical of the *Colombian Pacific Coast*.
- Provide methodological and conceptual tools that promote gambling contextualization of environmental education and management of risk within the local realities of the Colombian Pacific coast.
- Provide alternatives from which, for teachers to identify potential routes and scenarios, to ensure the projection of the Tsunami as GdR axis Educational Institutional dynamics.

In addition, the proposed objectives, this report aims to contribute in some way:

- Building a culture of participation, based on equitable principles and the particularities of the regions differentially according to diverse cultures and historical processes of the communities in contexts where these are located.
- Strengthening inter-institutional spaces and cross for the qualification of environmental education processes and GdRs, in the context of education policy, environmental, environmental education and *risk management* of the national, regional and local levels.



2

METHODOLOGY AND STRATEGIC PLANNING CONCEPT FOR WORK AND PROJECTION⁴

Proposals and/or environmental education projects for the incorporation of GdR by Tsunami are closely related to the methodological elements that streamline the interaction of teaching-learning principles, the critical research and community projection. This, to achieve the fundamental changes that are required from the perspective of school as an institution and from the recovery of other educational spaces for the permanent reconstruction of culture on ethical frameworks aimed at environmental sustainability.



The beauty of the mangrove of Tumaco.

Thus, methodological issues must be designed to facilitate understanding of the interactions between environmental components, to search for individuals, groups and communities to develop strategies for this and that lead to propose and participate in a qualified manner, in alternative solutions to particular environmental problems.

It is important to ask, that any system that is developed methodology for understanding the systemic view of the environment and from the design of comprehensive training, should incorporate both its conceptual planning projection, the participatory nature as this enables a permanent collective and can recognize not only everyday knowledge and / or traditional, etc. as necessary scientific knowledge for the analysis of particular issues, but the horizons of life and aspirations of the communities, leading to real gains in field of Environmental Education.

4. Apart taken from the text display Reflection and Action; Basic Dialogue for Environmental Education (p. 15-17, 2001), provided by the Ministry of National Education: Environmental Education Program, contextualized to the purposes of the Workbook.

Methodological system that incorporates participation as proposed here should enable:

- a. **With individual, group and community:** working in partnership to encourage understanding of the interdependence of individuals and their environment; appropriation of collective construction of reality and attitudes of appreciation and respect for the environment.
- b. **Socially:** to build and strengthen participatory processes, management, consultation and negotiation of conflicts, among others, for proper management of the environment. Processes wherein as claimed Atencia, J. (1996)⁵, participants believe decision-making mechanisms, guidance and control them and in the *process of creation*, become aware and develop a sense of belonging, both to their community as their location and/or region within universality scenario.
- c. **Culturally:** seek to transform audiences subjects, in subjects participatory processes of transformation of the environmental reality, promoters of the spaces and times of the communities (their culture), and agents of the environmental screening, in the various activities of social development from a sustainability vision that will lead the force and permanence, not only natural but also the diversity of cultural diversity.

Thus, through the modules presented in this book, stands as a key strategy for the development of methodological and conceptual projection of the proposal: The Workshop, considering that this can contribute to system building methodology, flexible and relevant the environmental and educational contexts in which they develop various environmental education activities.

The methodology of the workshop as a central axis to position the work of teaching a particular environmental issue, everyday, to develop on and around it, all types of event production, both critical reflection and projection into action, attending to their principles conceptual and operational, which have their greatest significance in the process view and production of concrete,



Life smiles on the shores of the Pacific Ocean.

5. Atencia, J. Towards the encounter in Environmental Education through participatory education, internal working document, Environmental Education Program, MEN, Bogotá, 1996.

which in the case are related to the qualifications of interactions: society, nature and culture, from building and training scenarios action. All these in the context of the search for meaning, and transformation of systems of reality of individuals and groups that are part of a local or regional community.

2.1. The Workshop: Event Production

The Workshop should be considered as a strategic tool for the development of training situations and/or environmental education. It should be understood as an ongoing process of knowledge construction for the interpretation and understanding of a particular environmental reality. Thus requiring permanent reading of context, since the scenarios in which there is a problem and for which individuals and groups are made of quality, in terms of training and outreach is concerned. This of course, from an ethical reflection that will benefit from a concept of *quality of life*, according to the needs of cultural diversity.

The exercise presents the possibility of going adjusting activities according to the needs of the dynamics of the proposals, allowing the systematic work process itself and the adequacy and/or arrangements in the interests of key players in the educational proposals. It also allows the incorporation of both permanent activities such as timely, flexible construction process and revealing moments, spaces and time required to scan the field and to obtain information for analysis herself and the projection of results in formulating explanations and implementation of intervention actions.



Workshop of the Colombian Red Cross, community and township officials of San Luis Robles.

The work of the Workshop is pivoted through a permanent exercised questions and seeking answers, which is now an enabler of construction, is a facilitator of processes and is ultimately the premier event of the confluence of knowledge and/or knowledge for the interpretation of reality and reflection about values and attitudinal changes are necessary in making responsible decisions regarding the resolution of environmental problems are concerned. In this context the development of a workshop involving key lines of action, among which can mention:

- a. Building a framework of work related to particular environmental problems, an object of the educational but also with the approach of education and teaching situations and the conceptual universe that is the basis for training activities, from the axiological and epistemology of environmental education and from the social and cultural contexts that serve as stage for the significance of knowledge and transformation of reality.
- b. The production of contextual reading instruments (natural-social-cultural) considering the interactions established between these three components and reflects the quality of an environmental situation, realizing their problems and their projections in the context of sustainability.
- c. The selection of items for the organization, interpretation and analysis of information, taking into account the pedagogical and didactic visions can contribute to the interdisciplinary work required to understand the environment as a projection system for actions, from the complexity of same in regard to the social dynamics and natural systems, which is building its own cultural framework.
- d. The preparation of spaces for discussion, synthesis and conclusions. Spaces are built from the continued enjoyment of the dialogue of knowledge and the *benefit of learning, knowledge and know-how to be*, placing as fundamental values of tolerance, *respect for differences, solidarity and consensus among the agencies and the community*, as essential foundations of autonomy and responsibility.
- e. The organization of field trips, to *the stage where the problem occurs*, or where it is evidence and/or verified. It can be understood as a socio-cultural event of significant knowledge, allowing a *critical reading* and reflective of the dynamics of local environmental contexts and/or regional. This implies recognition of the environmental space, framed by a quest for meaning, for understanding as dynamic and complex system.



Teachers invited by the Mayor of Tumaco and the Colombian Red Cross to train on the issue of Tsunami.

- f. Making systematic tools and socialization that involve all actors involved in the process of constructing meaningful knowledge from environmental education proposals, putting their individual interests and collective competencies and responsibilities, their ability to forecast and putting qualification to serve the educational process while the actions of intervention, from preparation conscious participation in decision making regarding environmental issues are concerned.

All the Workshop must be crossed by a work of interpretation and argument that may contribute to the mobilization of the representations that individuals and groups of their own environmental reality and half in the quality of their interactions. In addition, the Workshop proposals should be accompanied by projection of the GdR by Tsunami at the local, regional and national.



Construction sector of pile-dwelling in Tumaco.



RELATIONSHIP-TERRITORY-DEVELOPMENT-ENVIRONMENT, A FRAMEWORK FOR THE INTERPRETATION OF THE TSUNAMI


Tsunami understanding the phenomenon and the projection of this, in training processes to build a culture of GdR that effectively contribute to the reduction of the vulnerability of communities in the *Colombian Pacific Coast*, invites his gaze on the tip reflections related to a systemic approach to risk management, have been consolidated in the different scenarios, academics and politicians at national and international levels. Correlating the tenets of the Cultural Theory of Risk, that involves human actions, valuation of these, the risk as a creation of the human species, the consequences and the cultural effects with national policies (Douglas 1996).

These reflections are concerned as well, to advance on a thorough analysis of phenomena such as the Tsunami, from the reading of its origin as a product of the relationship-development environment and territory, as stated Lavell, when he says that risk management must be understood as "... *a component parameter and development management, environmental management and overall management of human security as a prerequisite for achieving sustainability ...*"⁶. According to the above, are: the environment, planning and development of the fundamentals that define the landscape of Tsunami interpretation of the phenomenon in the context of local environmental realities.

The systemic approach to which reference has been made, has fundamental implications on knowledge systems installed today, since it places the environment as a dynamic system defined by the interactions of physical, biological, social and cultural rights, perceived or otherwise, between the Humans and other living beings and all elements of the environment where they operate, are these elements of natural character, or transformed or created by man (PNEA, pg. 16).

In turn, this approach poses challenges of transforming the concepts of territory and region, requires a shift from merely conceiving geographic areas to be considered as products of cultural constructions carried out by organized communities, where language becomes the main instrument that construction.

6. Lavell et al. About Risk Management: Notes towards a definition, 2003.



Also, do not forget that in the same way as the diversity of the natural environment offers opportunities for different social and economic development that require more or less effort to achieve progress, cultural diversity raises the need for a differentiated treatment of the territory⁷, which respects the different cultural or ethnic groups that coexist in the space⁸.

The concepts discussed should be considered from the fundamental commitment to move towards "... *development models that incorporate a concept of sustainability is not only natural but also social, and locate our cultural diversity as strength, to move towards appropriate transformation of our environmental realities ...*" (PNEA, pg. 24).

In this context, understanding the phenomenon Tsunami in the *Colombian Pacific Coast*, from its complexity, forced to revisit the environmental situation in the region, and analyze in depth the role played by the permanent interaction between the Ocean and the consolidation of territorial development of local communities, because as stated by the CCO "... *from early times, the ocean has been an essential part of the historical development of Colombia, or as a means of communication, subsistence or final stage of events for independence and development ...*"⁹.

Today the Ocean continues to play a key role in national development and specifically for those communities that make up the *Colombian Pacific Coast*; the complexity of these interactions requires the different institutional actors and civil society, a deep knowledge of their natural dynamics, social and cultural rights.

Previous approaches in the particular context of this Workbook outline for the educational communities of the *Colombian Pacific Coast*, a series of challenges relating to:

- a. Understanding and ownership of the Tsunami phenomenon, from the systemic approach, and its projection in all the dynamics of educational institutions, especially in the training processes for risk management.
- b. The contextualization of the guidelines expressed herein in the context of particular realities of local contexts in which the school is involved.

7. In the particular case of this Workbook, it is important to emphasize that despite being regarded as a regional tool for the Colombian Pacific Coast, the projection of the approaches presented here require contextualization process is just "sense" in the reality of local communities.

8. Cabeza Massiris Angel. Land Construction and Regional Processes. Available in www.banrpcultural.org

9. Colombian Ocean Commission. The Ocean in the Natural and Social Sciences. Bogotá, December 2001. Available in www.cco.gov.co / Iciencias.htm.

3.1. Reflection

To deepen the appreciation of the history of the *Colombian Pacific Coast*, from the identification of relations from cultural practices, the company has established with its natural surroundings, to understand the vulnerability that currently exist to address the phenomenon Tsunami. In this sense, then, would be worthwhile for the reflections and dynamic teaching the subject at the institution, encourage students to think about:



Residents of Tumaco, doing craft work shellfish harvesting.

How was the process of occupation of the territory in the Colombian Pacific Coast? Especially in regard to the development of:

- a. Infrastructure (housing and equipment).
- b. The different means of transport used by residents.
- c. Cultural practices that have been developed for the use of natural resources.
- d. The forms of organization of its inhabitants, for the undertaking of local development processes.

3.2. Suggested Activities

1. With students and the working group involved in the management of risk in the institution, conduct an interview with an older guy who knows the history of the Municipality, an adult and a young man, trying to find the information three, the following:

- a. How do you see the Pacific Ocean?
- b. What does each of them the Tsunami phenomenon?
- c. What areas were located the first settlements of the municipality?
- d. What sectors are currently located?
- e. What is the distance from the Ocean, in both cases?
- f. What is the reason for this gap?
- g. What materials were the houses built 60 years ago?
- h. What materials are houses built today?
- i. What strategies used by people to make their decisions 60 years ago?
- j. What strategies used today?
- k. Since when, the territory where they live, was recognized as a municipality?
- l. What are the means used by settlers to move from one sector to another?
- m. What medium in use today?
- n. What were the main economic activities employing residents 60 years ago?
- o. Do you currently, what are the main economic activities?
- p. How has the power of the people for 60 years now?
- q. What is the influence of the Pacific Ocean in food production in the region?

2. From the information gathered in interviews with students and reflect the working group on the evolution of cultural practices installed in the municipality, and following the approach of this module, identifying:

- a. The impact of cultural practices in risk management by Tsunami..
- b. Social factors, natural and associated cultural vulnerability of the population, compared to the Tsunami phenomenon.

3. Discuss how the three individuals interviewed Tsunami irrigation conceived, trying to establish a relationship between this concept and the contexts described by these individuals.

4. Jointly build two maps that account for the data collected within the context of 60 years ago and today.

5. Place students along with old photographs and organize a photo museum, compare it with recent photographs and draw a timeline through the photographs, analyzed in relation to information supplied by the three individuals interviewed.



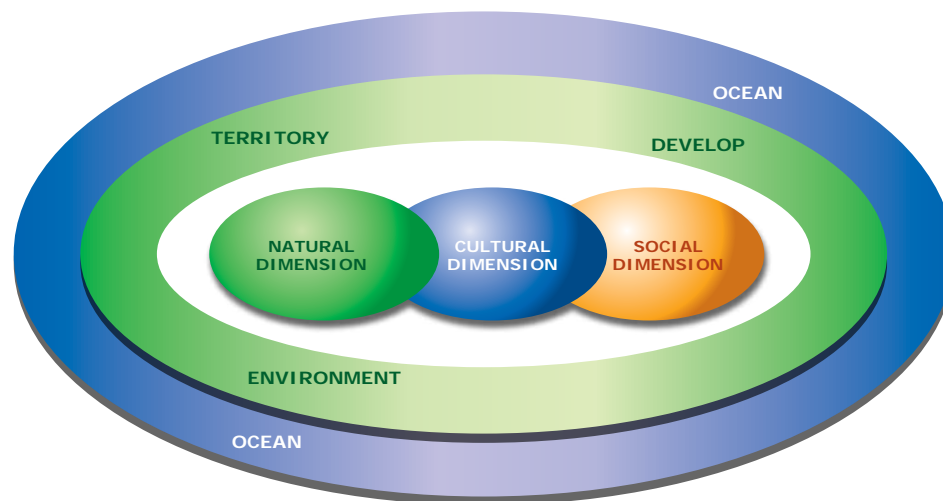
Educational institutions in Tumaco, actively participated in the drill 2010.

4 MODULE 2

COLOMBIAN PACIFIC COAST AND THE TSUNAMI

Understanding the Tsunami phenomenon in the context of the *relationship-development environment and territory*, requires analyzing the characteristics of the *Colombian Pacific Coast*, from the confluence of three interacting dimensions: a *Natural Dimension* that recreates the heart of Ocean Development Colombia's Pacific coast, from the geographical, wealth and providing opportunities for interaction of human beings with it and the Tsunami phenomenon as the natural consequence of an event, a *Social Dimension* refers to the process of organization and structure of agents that make a society and a *Cultural Dimension* that includes the imaginary that guide the practices from which to relate the three dimensions.

Graphic 1 Relationship Colombian Pacific Coast-Ocean

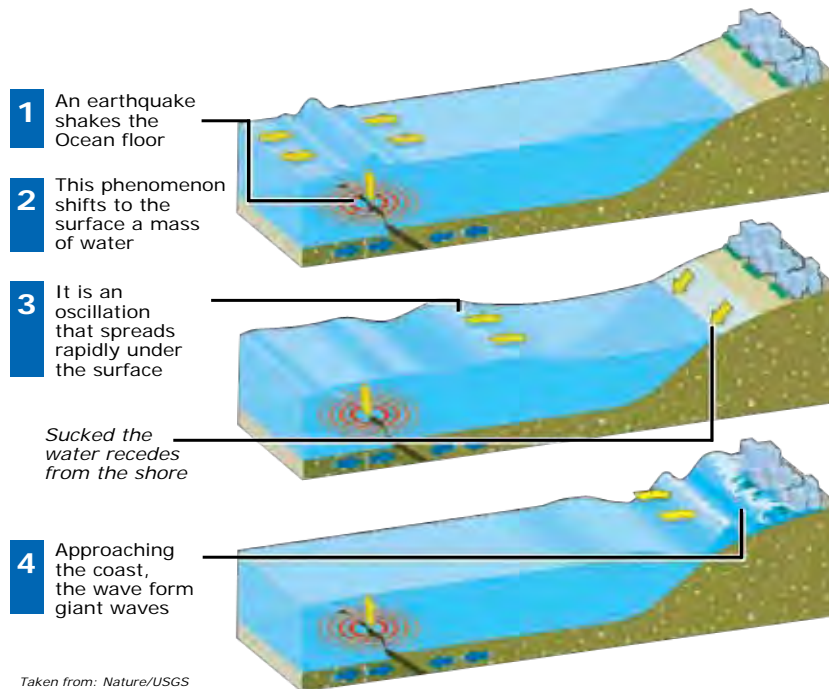


It should be noted that although the Workbook develops independently proposed dimensions, its analysis should consider not actually given first dimension than another, but the three interact permanently in the same space and time, consolidating and dynamics of simultaneity, which should come to be regarded as the basis of local development actions, and as a starting point for conducting training process on the issue GdRs.

4.1. Natural Dimension

The *Natural Dimension* in its purest conception refers to the biological, the natural beings, it also has other opinions such as that of the Greeks, who speak of it as the essence, the properties of something, so for this exercise, is determined to Natural Dimension phenomenon such as the characterization of the Tsunami and its relationship with the *Colombian Pacific Coast*, in order to place the teacher in the regional context.

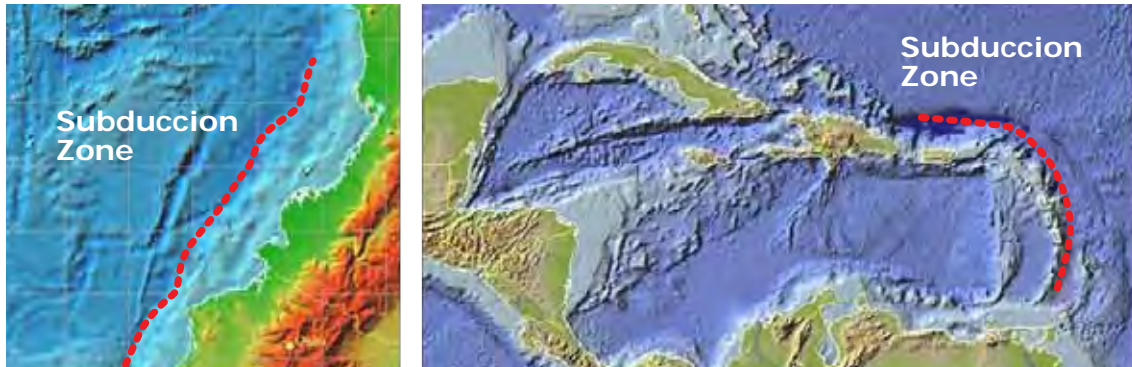
Figure 1 Formation of a Training Scheme Tsunami



Can determine that the Tsunami is a phenomenon associated with the dynamics of the ocean, the tsunami comes from the Japanese word meaning *Tsu port or harbor and nami meaning wave*. The phenomenon is described as a wave or a group of large sea waves, caused by a disturbance in the body of water. Such disturbance may be due to different events: an earthquake in the sea or on land near the coast, an underwater volcanic eruption or in the earth's surface, a mass removal of large quantities or a strong impact on the surface of the Ocean.

By generating the Tsunami, the first of several waves can reach the beach quickly, possibly before issuing an alert. It is important to note that there are different hazards for those who must prepare floods, water pollution, fires, broken pipes or tanks of gas, power cuts etc.

Figure 2 Zones of the Pacific Ocean and Caribbean Sea Basin



Taken from PNGRT. CTNAT 2010

In the case of Colombia, "... the two coasts that our country possesses, is the Pacific Ocean which is a higher degree of exposure to a natural phenomenon Tsunami (Figure 2), because near the coast is the Pacific Subduction Zone, where tectonic plates collide Nazca and South American, this area is part of the Pacific Ring of Fire is the most active seismic zone of the planet."¹⁰


For purposes of this Workbook is important to expand the natural characterization of the Pacific Ocean and its context, the *Colombian Pacific Coast*, highlighting in this context that the Pacific Ocean is the world's largest, occupying a third of the earth's surface . It contains a large number of islands (approx. 25,000), most of them located in the south of the equator.

It has communication with the Atlantic Ocean through the Panama Canal, the Strait of Magellan and Drake Passage. There are recorded temperature ranges from freezing to 30 degrees Celsius, where salinity also changes with latitude.

10. PNGRT. CTNAT.2010



Pacific beaches are lands of peace and beauty.



The Colombian Pacific Coast, is located west of the country, consists of the departments of Chocó, Valle, Cauca and Nariño, in the area known as the Chocó, this location allows you to interact on the north by the Republic of Panama, south by the Republic of Ecuador, east to the Western Cordillera and west by the Pacific Ocean.

"...Has one of the highest concentrations of species per area, fauna and flora. The regional flora contains between seven and eight thousand varieties of the total 45 000 plants in Colombia, the central rain forest is the point of maximum floristic diversity of tropical America. Its rich fauna is characterized by the presence of a large number of endemic species. In terms of birds, the region has 62 species of limited distribution, the highest in South America".¹¹

There developed the rainforest, abundant timber and the main forest ecosystems including the extensive mangroves, followed in importance by Guandal, terrace forests and hills. Generally in the Pacific region are not many high mountain areas, but has as the Baud foothills, the limits of Darien and the Cordillera Occidental.

In the rainforest of the Pacific region, there is a large variability from the climate that includes super-humid to semi-humid, a feature which together with its coastal location, determines the water resource as a definitive factor in the development of communities are located there. This resource is also represented the Pacific Ocean (salt water source), in a series of freshwater sources such as rivers Atrato, San Juan, Mira, Patia and Baudó, used as transport and power supply.

"...The Pacific coast can be said to be divided in two different physiographic regions: the northern area between Panama and Cabo Corrientes, composed of very rugged coastal cliffs, south of Cabo Corrientes to the border with Ecuador, the coast is low , alluvial flood plains covered with mangroves in small sections interrupted by cliffs."¹²

This has always been determined that the various human settlements develop all social dynamics around the coasts and riverbanks, highlighting major population centers such as Buenaventura, Pretoria, Tumaco, Bahía Solano and Guapi. INVEMAR in their annual reports has characterized the continental and insular Pacific region in areas such as: temperature of the surface of the sea surface salinity, ocean currents, waves, tides and warm Pacific phenomenon, which allows a view broader *Natural Dimension* of this Colombian region.

11. Available at: <http://www.colombiaaprende.edu.co/html/etnias/1604/article-82880.html> Afro Atlas of Cultures.

12. Status Report Environments and Coastal and Marine Resources in Colombia. INVEMAR. 2004.



Cueros y Chonta band, first place in the version 15 Music Festival Petronio Martinez .

4.2. Social Dimension

All the features described make the *Colombian Pacific Coast* a setting conducive to development and a resource that allows its people to generate their own dynamics of social organization, which makes it attractive to move or improve human settlements and its main population centers in other communities as recipients for administrative, health care, etc.

In order to locate the GdR in the context of territorial development dynamics, we can say that in this region the different members of society down to the Ocean and all the water mains associated risk-benefit ratios, ie because the sea is a major development potential, the locals take their coexistence in a context of ongoing risk, in order to receive benefits on development (cultural, natural and social) will provide the coast and the Ocean surrounding areas. A specific example of this is the location of most of these populations on the banks of rivers or on the beach, then located in a remote area incurs higher costs (mobilization, food, utilities).

It is noteworthy that the capacity of local government are limited in terms of social organization and cultural, and political agendas that¹³ of these communities are designed to meet basic and immediate needs, since they are small government are not a priority development of long-term projects, as required by environmental education and the GdR.

13. Based approach built on the experience of the Colombian Red Cross in the development of CRC-UNESCO-TUMACO Project and process diagnosis of the Atrato River communities of the Municipalities of Medio Atrato, Bojayá and Carmen del Darién.

Despite this, there are informal dynamics that have fostered the consolidation of the GdR pragmatic structures, each municipality works differently but despite this trend can discriminate how socially and politically organized administration, public, private and community.

It stands in relation to the above, a product of coordination between different institutions at local, regional, national and international progress has been made in organizing and strengthening local capacities, from the consolidation of inter-agency technical committees, both the issue of GdR (CREPAD-CLOPAD) and environmental education (CIDEA).

In terms of community building processes for the Tsunami issue, the DGR has advised the 16 CLOPAD *Pacific Coast*, the DIMAR has developed actions in some communities and educational institutions in Tumaco, the CRC has made a greater presence since 2009, in different communities and the schools sector training to 20 *community emergency equipment*, among others, by what is already an installed capacity in the municipality of Tumaco, but more than capacity, extensive experience in community building processes and preparation for risk from a Tsunami, here the importance of being able to multiply Tumaco experience to other municipalities of the Colombian Pacific.

In this sense, the institutions that accompany development efforts are subject to starring members (institutions, grassroots organizations or personalities) of the community, no matter who lead the processes associated with the GdR, so the daily actions has led to in some municipalities, or Municipal Government Secretaries of Planning, are those who assume the leadership of CLOPAD,



Construction sector of pile-dwelling in Tumaco.

which in turn work closely with CREPAD Coordinators, all under the direction of the DGR, this scheme organisms are added relief, technical agencies, autonomous corporations and other opinion leaders who are responsible for ensuring the good actions for the benefit of the municipality or Department, under the SNPAD.

As part of this can be recognized from the PNGRT that the ability of the Colombian Pacific area is as follows:

Institutional response capacity in Municipalities of the Colombian Pacific¹⁴

COUNTRY AREA	CIVIL DEFENSE	RED CROSS	NATIONAL FIRE SYSTEM
CHOCO DEPARTMENT	X	X	
Municipio de Jurado			
Municipio de Bahía Solano (Mutís)			
Municipio de Nuquí	X		
Municipio de Pizarro (Bajo Baudó)			X
Litoral de San Juan (Municipios)	X		
VALLE DEL CAUCA DEPARTMENT	X	X	
Municipio de Buenaventura	X	X	
CAUCA DEPARTMENT	X	X	
Municipio de López de Micay			
Municipio de Timbiquí			X
Municipio de Guapi	X	X	X
NARIÑO DEPARTMENT			
Municipio de Santa Bárbara			
Municipio de El Charco	X		
Municipio de La Tola			
Municipio de Olaya Herrera	X		
Municipio de Mosquera			
Municipio de Tumaco	X	X	
Municipio de Francisco Pizarro	X		

Finally in this complex social dynamic, it is important that teachers understand that their actions in training for the GdR permanently interacts with the other institutions that accompany the development of the subject in the local context, so that all processes of incorporation of the GdR in educational institutions should be embedded in policy and planning instruments associated with the theme: Municipal planning Department and Environmental Education, Municipal Plans of Territorial Management, Environmental Management Plans and Development Plans, etc.

14. Taken from PNGRT.



Everyday merges with the Ocean in Tumaco.

4.3. Cultural Dimension

The final dimension on which it is important to analyze the phenomenon of the Tsunami in the Pacific Coast is the *Cultural Dimension*, understood as the perspective that considers the imaginary community built on the phenomenon. In this sense, it is important to understand that from the cultural representation of the inhabitants of the Pacific Coast, the Ocean is a threat to us, rather it is living, recreation and lifestyle, this factor should be considered as a starting point for development of training processes, aimed at strengthening the capacity of understanding the phenomenon and a response time of emergency or disaster.

It is also important to note that the risk of tsunami for the *Colombian Pacific Coast* is present and although the majority of human settlements in the country is not in this area must take into account that the municipalities of Tumaco, Bahia Solano, Buenaventura and Guapi are tourist areas, where people come to activate the local economy, so it is important that people understand **the importance of the preparation processes, not as a threat but as a local strength in order to protect the lives of locals and visitors.**

The picture that reveals the *Cultural Dimension*, means that the main challenge of the teacher to identify from which imagination is installed Tsunami phenomenon in the system of knowledge of the educational community, so that processes can be targeted effectively to mobilization of these imaginary, to build a culture of risk management to be able to install a dialogue between the existing system of everyday knowledge and scientific knowledge system and in turn these with the dynamics of development and therefore with the local environmental system elements.

4.4. Case Study: San Andrés de Tumaco and the Tsunami

San Andres de Tumaco, known as the Pearl of the Pacific, is located in the Department of Nariño and was founded on November 30, 1640, according to the O13 Agreement in August 1988, but "... *in the region of Tumaco human population since there half of the first millennium BC, ie 2500 years ago. So the area was occupied by Nariñense Coast man before our Andean Region...*".¹⁵ On the period of 1780, Tumaco had approximately 2500 inhabitants, currently home to some 161,500 people.

"...Needless to say, in what is now Tumaco indigenous population existed long before the discovery of America in 1526 when Don Francisco Pizarro arrived on the island, found the tribe of the Tumas. They lived mainly on fishing and descended from the Faces, the Peruvian people that took over the territory of Esmeraldas and settled in Tumaco land ..."¹⁶ This reveals that from the beginning the people of this region and interacted with the ocean as a basis of their livelihood.

The *Social Dimension* of the municipality of Tumaco revolves around four basic activities in economic, agriculture, fisheries, forestry, and tourism, all related to the water dynamics that characterize the *Colombian Pacific Coast*, and especially this area, with a high incidence of social and cultural systems.

In this sense productive activities affect and are configured through the social, cultural and natural Municipality, the fishing has established a lifestyle in *tumaqueños*, seafood is the staple food in the area, despite it not all anglers are aware mittens and environmental impact generated in the territory.


Around this productive activity has even a distribution of roles and in most cases the woman is looking for crustaceans in the mangroves while the man goes out fishing. Agricultural activity has a presence in the area, noting that in recent years this production system has changed considerably, driven by income-generating projects that have shown the economic benefits generated by the palm crops.

Proceeds from this new trend of production, Tumaco suffers from an oversupply of product and shortages of basic foodstuffs in the diet of the locals. No less important is *tourism* as an economic activity, as each season thousands of visitors arrive on its shores seeking a recreational option, generating a significant source of income for the inhabitants.

In this context and for the particular case of the GdR by the Tsunami in Tumaco, it should be noted that for people who benefit from these economic activities, the threat associated with this phenomenon, is installed not from the occurrence of natural phenomenon, but from the incidence risk that this situation has had on their development processes, for example:

15. Available at: <http://www.tumaco-nariño.gov.co/nuestromunicipio.shtml?apc=mlxx-1-&m=f>

16. Idem.

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- a. The issuance of a regulation related to the issue has implications for environmental constraints, land use planning and installation of production systems.
 - b. In the imagination of the inhabitants is installed the idea that outreach efforts, signage, flyers, radio spots, among others, who have made different institutions, foster a perception of insecurity.

As for roads and infrastructure Tumaco resembles a funnel, the only way out to the mainland is the bridge Pindo, considered insufficient¹⁷ to be the main route of evacuation of more than 90 000 people inhabit the islands of El Morro, La Vicious and Tumaco. It also has an airport that covers the route Cali-Tumaco-Cali, where two airlines operate, also owns land connection with the city of San Juan de Pasto.

Only in the twentieth century Tumaco was hit by two tsunamis, the last time, 1979, more than one thousand victims because of overflowing population growth, migration of people from mountainous areas to the coast and exposure the homes to hit the waves.

"...Of the earthquakes recorded only in 1906 and 1979 generated tsunamis, but in 1906 was presented as narratives of the villagers disappeared Tumaco's population at that time. The Tsunami earthquake of 1979 was largely contained in sedimentary deposits near the island of Tumaco, formed the island of El Guano, these deposits accounted for a large part of the energy of the Tsunami, as the island was literally swept away by the force wave, however, the effects were palpable in some unfortunate cases such as San Juan de la Costa, as its structure was completely destroyed. It is estimated that the effects of the earthquake killed about 500 people and 3000 homes were affected ".¹⁸

Historically Tumaco has been beaten by natural and manmade such as earthquakes, earthquakes, fires and Tsunamis, which have led to disaster and the low capacity of response from the agencies and the community, have confirmed the vulnerability of the Nariño Municipality. These events can be mentioned the following:

- 1868, earthquake in Colombia and Ecuador.
- January 31, 1906 earthquake and Tsunami.
- December 12, 1979, earthquake in the South Pacific Colombian, followed by Tsunami. Destruction of San Juan de la Costa.
- 1983, storm surges and El Niño phenomenon.

The union of the threat, and vulnerability Tsunami, overcrowding, caused a risk that forced them to take immediate and definitive leading in 2002 the National Government through the DGR, CLOPAD has decided to support the formulation and implementation of Local Plan and Emergency Contingency for Earthquake, Liquefaction and Tumaco tsunami, a fundamental tool and guide to reduce risk in the population.

17. Cuero, Franklin. Experience in Peru Earthquake Evacuation of 2008.
18. Taken from PNGRT. Page 18

Thus, the Government allocated the budget through the National Calamity Fund to carry out technical studies in 2003, such as the Study of Liquefaction (INGEOMINAS), the Social Vulnerability Study (Cauca University), the Vulnerability Study Physics (Seismological Observatory South West) and Tsunami Inundation Study (DIMAR).

The results so far have been achieved in these processes of institutional management, are the result of teamwork, where the head of state chaired by the CCO, CTNAT and International Cooperation, have been following since those times and even today, implementing special actions such as drills and others, aimed at motivating *tumaqueños* continue to bodies and local authorities to be more aware of and contributors in the preparation, organization and attention to this potential type of emergency, with the morale and commitment work towards reducing the risk of tsunami in Tumaco to levels that will save lives.

Similarly, the vulnerability of communities and sectors of Tumaco increases, the poverty and violence and the increasing population birth as both migration processes (displacement), which led to the creation of areas often referred stilts "bridge" housing alternatives invasion. These invasions and environmental degradation in various fields, 79% of the population of San Andres de Tumaco be exposed to levels of risk.

The municipality of Tumaco, in addition to the Tsunami natural phenomenon, presents other situations that may weaken the performance of the public from a dangerous situation, condition is imposed as a challenge to the educational system, the processes of management training risk, have the strength enough to settle in the local daily life and thus become a strength that allows you to develop as a region.

4.5. Reflection

Having identified the relationships from cultural practices, the society has established with its natural surroundings, it is important to place in local, as in the Department or Municipality, interact with each of the dimensions (natural, cultural and social) versus Tsunami occurrence of the phenomenon, but it is against the preparedness and prevention processes that must be carried, therefore, taking into account the proposed case study, to facilitate a process of contextualization that evidences: ¿What has been the community's role in the occurrence of the tsunami in Tumaco and what should be the role of the community against this phenomenon?.



Signs-sponsored entities that interact with the community in the region.

It is important to invite students and the community to make a historical comparison that will uncover, while the tsunami happened, what did the community, what are you doing today to address this phenomenon, as the GdR affects the processes of local development and what is the importance of the participation of educational institutions in the GdR.

4.6. Suggested Activities

1. Refer to the Plan or Scheme of Land Management and Environmental Management Plan of the municipality and see if there is mentioned the importance of having an Ocean as a neighbor and if we take into account the ordering of it.
2. Ask if the Municipality has Municipal Plan for Risk Management and discuss with students on five aspects to be taken into account in the GdR by Tsunami.
3. Arrange with the educational community of the institution, a Forum on the GdR in the Municipality or in the *Colombian Pacific Coast*, trying to invite an official of the Autonomous Regional Corporation and an official of the Municipal Government, for setting out from his experience technique, as these two instruments were constructed and how each of these institutions conceive of risk management by Tsunami.
4. Students critically analyze the School Plan for Risk Management of the institution and with the group of teachers, identifying, if the Plan includes elements that account for the social, cultural and natural referenced by this module.



Protection area in tents, during the 2010 drill.

5. Locate the representative of a relief agency, Red Cross, firefighters, civil defense or organize a mock CLOPAD under the Plan Risk Management School.
6. Place in the town's evacuation routes and demarcate with students on a map.
7. In the courtyard of the school buildings make stilts and using a bowl or tank to simulate a Tsunami. Observe what happens.



POSSIBILITY OF PROJECTION OF THE MANAGEMENT OF RISK IN TSUNAMI DYNAMICS OF EDUCATIONAL INSTITUTIONS

Having recognized the conceptual basis from which to install the theme in the training process and to raise the development of concepts-development environment and territory, in the particular context of the *Colombian Pacific Coast*, this module aims to focus reflection on the principles, criteria and methodological elements, which open possibilities for the incorporation of the GdR by Tsunami, as a central focus of the formal education process.

5.1. Beginning

Multidimensional and Concurrency

From the training processes undertaken by educational institutions are required to advance the understanding of the tsunami, from its complex nature, it is necessary to develop a permanent basis, analysis and synthesis processes, it is necessary that educational institutions, strengthen teaching strategies and teaching which allow for natural dimensions in dialogue, social and cultural phenomenon in space and at a specific time and this, in the context of the relationship-development environment and territory.



News Center Mayor of Tumaco

Risk management should begin in the classroom.

Integral Training

Educational processes associated with the Tsunami GdR must seek alternative educational and training order, to install a dialogue between the different dimensions of human development including: ethics, aesthetics, scientific, technical, technological, political, trying to ensure that the knowledge built from the training experience, will be helpful to student understanding (from global and local references) the reality of the context and decide to contribute to the transformation of environmental issues within a framework of accountability.

Interdisciplinary

Whereas the incorporation of the GdR by Tsunami must be addressed as an issue common to all areas of knowledge in this Workbook, interdisciplinarity is understood as a permanent scenario in which different disciplines are linked to contribute in the understanding of the phenomenon Tsunami. Importantly, this joint goes beyond the simple exchange of content, and invites them to enter into dialogue, the epistemological foundations of each discipline and different knowledge systems (daily, science, traditional), present in the context, so that from these dialogues, students pick up tools of conceptual, contextual and methodological explanations for the construction of the phenomenon, from its own system of reality.



Street where use in the evacuation drill 2010.

Institutionalization

The incorporation of the GdR by Tsunami in the process of formal education, is seen as a bid to transform all the dynamics of the educational institution; but must have the active participation of all members of the educational community should respond to environmental needs, to the dynamics of local development and the challenges of cultural transformation, specific to the context in which the institution is involved.

Interinstitutionality

The development of training processes for *risk management* by Tsunami requires educational institutions to visualize his actions in the context of systems that have been consolidated in the country, both for environmental education, educational SINA and for the risk management SNPAD. This also means that any initiative from the school will promote, must come from the deep recognition of competences and responsibilities as an institution has, since the purpose of these two systems and critical reading of the policy instruments that have been built from the national and local level in relation to environmental education and *risk management*.



Tumaqueños Group, following instructions of the CRC guides during the drill 2010.

5.2. Criteria

Relevance

The comprehensive training process envisaged inclusive educational institution, which conceives of the different members of the same, as agents of transformation, which are part of a system, so, as one of the greatest challenges of education for the incorporation of Tsunami *risk management* is the recognition of local contexts, from a systemic approach which recognizes the natural dimensions, social and cultural phenomenon, and the interactions between them. So the processes of formation, according to the needs of cultural transformation of the contexts in which the school is immersed in this sense, environmental education should be conceived as an integral process that through culture, committed and projects the future of relations and interactions of human beings to himself, as part of their social organization and nature.

Coherence

All training processes for incorporating the environmental dimension and the GdR, in formal education, requires the teachers and all members of the school, a process of recognition and critical reading of the instruments of political, technical and normative guiding the development of the GdR and environmental education at local, regional, national and international levels so as to achieve a dialogue between these tools and training challenges that have been raised over this Workbook. Consistent with this, the deep analysis of these instruments should contribute to the educational institution to project its power, since the recognition of its powers and responsibilities in the framework of the purposes of environmental education systems and the GdR.

Flexibility

An understanding of the powers and responsibilities of the school, leading to its members to identify themselves as actors with technical advocacy and environmental education processes and GdR. This recognition of the school as a political subject brings with it a recognition of other political actors associated with the topic as government institutions, NGOs and grassroots organizations, and their respective responsibilities, facilitating the establishment of arrangements for the effective projection of the subject in the local area, within the concept of responsibility.

5.3. Reflection

The incorporation of *risk management* by Tsunami to the dynamics of educational institutions must be conceived as a process and transverse joint construction. In this sense, should invite all actors participating in the training process, to be participants in the identification of mechanisms and strategies for understanding the subject from the school dynamics. In this sense, it's worth the dynamic reflections of the subject as a teacher in the institution, invite students to think about:

- a. Needs to move forward on critical reading, to allow identification of concepts associated with risk management by Tsunami and the mobilization of the same, within-territory relationship-development environment.
- b. The purpose of incorporating *risk management* into the school.
- c. The actors and scenarios associated with incorporation.
- d. The contributions from the various disciplines associated with educational institutions, are drawn to the understanding of Tsunami risk.
- e. Sustainable mechanisms to ensure the validity and permanence of the institutional issue.

5.4. Suggested Activities

1. Identify with students the different actors and scenarios that, according to the principles and criteria outlined in this module should be associated with the incorporation of *risk management* in the school.
2. Along with students, investigating each of the identified actors, which could be their interest in incorporating *risk management*, the dynamics of educational institutions.
3. Develop a team with the students a talk where the group of teachers from the institution by discipline expose how, each provides possible explanations, in relation to the Tsunami phenomenon.

4. Identify whether the Corporate Plan Risk Management, includes the contributions described by different teachers.
5. Discuss critically the School Environmental Project of the institution, and identify if the readings in context and provides strategies for understanding the phenomenon Tsunami.
6. Building together with other actors associated with the subject, a work plan that includes:
 - a. The main objective of the incorporation of risk management in the school.
 - b. Possible mechanisms and tools to install to incorporate the theme: classroom projects, scenarios for discussion, educational projects.
 - c. The way the issue must be installed on policy instruments and planning of the educational institution: PEI, Improvement Plan.
 - d. The actors responsible for the incorporation of the subject in school, their sphere of action and its ownership interests in the process.
 - e. A schedule of work and an act of commitment as a strategy for sustainability of the process.

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COMISIÓN COLOMBIANA DEL OCÉANO

2012

