

**THE SOCIAL AND ECONOMIC REALITIES THAT
CHALLENGE THE LINKAGES BETWEEN SUSTAINABLE
DEVELOPMENT AND THE MARINE ENVIRONMENT.**

LIAM DAVID CURRIE

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Thesis submitted in partial fulfilment of the requirements
for the Master of Arts Degree in International Development
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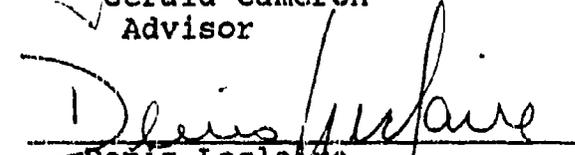
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ABSTRACT

THE SOCIAL AND ECONOMIC REALITIES THAT CHALLENGE THE LINKAGES BETWEEN SUSTAINABLE DEVELOPMENT AND THE MARINE ENVIRONMENT

Liam David Currie

January 1995

This study examines the social and economic realities of developmental and environmental issues in Chile. It is based on actual research and "hands on" involvement in the coastal areas of Chile where the concentration is on Marine Oil Pollution. Particular emphasis is placed on international environmental policies and their application to the marine environment. Although research was done in Chile, this study could be applied to any marine environment.

This study argues that the environment is essentially linked to development and since environmental problems influence decisions about the progress of many sectors, they are inevitably inseparable. Applied to Agenda 21 of the Earth Summit, 1992, this thesis supports the proposition that the earth's natural resources are pushed to the limit, jeopardizing development potential for the World. This, combined with the notion that improvement in the quality of life for the Chilean people (a codified Constitutional right), emphasizes the need for environmental responsibility to effectively manage the marine sector in that country.

This study advocates ocean management strategies through effective environmental programs, education and policies which will preserve Chile's ecosystems while promoting basic human needs via sound sustainable development principles.

To my wife Beatriz

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I thank Captain Jim Lawson, Canadian Coast Guard, and Captain Angus McDonald, for their time and input.

Last, but not least, I especially thank my brother-in-law, Arie Van der Gaag, and Guillermo Santa Maria Farr who have been key to my understanding and interest of the Chilean culture and history.

ACRONYMS

AWPPA	Arctic Waters Pollution Prevention Act
BOT	Build-Operate-Transfer
CAPP	Community Action Partnership Program
CERCOM	Regional Centre for the Prevention of Contamination
CONPACSE	Co-ordinated Programme on Marine Pollution Monitoring and Control in the South East Pacific
CPPS	Comision Permanente del Pacifico Sur (Permanent Commission of the South Pacific)
CSA	Canada Shipping Act
CZM	Coastal Zone Management
DEA	Department of External Affairs
DIRECTEMAR	Director General of the Navy, Merchant Marine and Coast Guard
DOE	Department of the Environment
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ENAP	Empresa Nacional Del Pretroleo (Petroleum Company in Chile)
GDP	Gross Domestic Product
GEF	Global Environmental Facility
HRD	Human Resource Development
ICLOS	Interdepartmental Committee on the Law of the Sea
IDB	InterAmerican Development Bank
IMCO	International Maritime Consultative Organization

IMF	International Monetary Fund
IMO	International Maritime Organization
ISD	Internal Security Doctrine
ISI	Import Substitution Industrialization
LOS	Law of the Sea
MARPOL	International Convention on the Protection of Pollution from Ships 1973 (MARPOL 73/78)
MEPC	Maritime Environmental Protection Committee
MOT	Ministry of Transport
NEP	National Environmental Plan
ODA	Official Development Assistance
OPA90	Oil Pollution Act 1990
OPRC	Oil Pollution Preparedness, Response and Cooperation Convention
OPEC	Organization of Petroleum Exporting Countries
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environmental Program
PPM	Parts Per Million
P/W	Petroleum on Water
SAPS	Structural Adjustment Programs
TOVALOP	Tanker Owners Voluntary Agreement Liability on Oil Pollution
TNC	Transnational Company (s)
VLCC	Very Large Crude Carrier
W/P	Water on Petroleum

CHAPTER ONE: INTRODUCTION

A. Posing the Problem

As industrialisation and urban development have come to reach the farthest corners of the earth, the evils that accompany them have also taken a global perspective. Prior to 1970, pollution did not appear to present major problems to either the developed or developing world. At the time, the negative effects of technological advances and the growth and complexity of petro-chemical compounds were not understood. However, experience has shown that these contaminants are endangering human and animal health, and the present deterioration of the environment is impacting on the quality of life at the present while affecting future generations.

While the developed countries are adapting to changing circumstances and taking some measures to protect their natural resources, the developing nations are faced with a difficult situation. The economic and political international order have not been propitious for the development of equitable societies or economic structures that benefit the nation as a whole. As a result, some of these countries have experimented with counter socio-political and economic alternatives of development. As a consequence, the addition of the new environmental agenda has added to developmental matters.

Chile, has many deep rooted developmental and environmental problems. These problems are often initiated by economic progress at a cost of environmental degradation.

*"Chile possesses a mixed blessing of an industrial economy, that is the envy of other Latin American countries, and the environmental costs that go along with it."*¹

The conflict between development and the environment in Chile is particularly evident in the case of the marine environment, which is threatened by oil pollution among other contaminants, and industrial pollutants.

B. Thesis Statement

Several approaches have been used to design development models in countries such as Chile. In this thesis I use a model that examines environment and development in a historical context, to make a case for sustainable development in Chile. To do this I answer the question - Is sustainable socio-economic development achievable without showing regard for and taking preventative measures to protect the environment?

The thrust of this thesis is that socio-economic development is possible only if sufficient measures to protect the environment are taken. Therefore, economic progress cannot continue indefinitely at a cost to the environment.

¹ Nash, N. (1992). Chile faces dilemma of industry vs. environment. The New York Times reprinted in the Globe and Mail, Nov. 14, 1994. Halifax.

People and the environment are central to development. This proposition requires a discussion on the position of countries, such as Chile, which face a large external debt, as well as being restrained in their actions by the conditionality of the International Monetary Fund (IMF) and World Bank structural adjustment programs. These countries have reached the conclusion that socio-economic development is tantamount to environmental responsibility. Social development therefore, is only sustainable if the resources of the Nation are protected for the benefit of future generations.

C. Methodology

My methodology involves an extensive literature review contained in Chapter Two. The methodology also involved actual hands - on field research for three months in the marine sector in Chile over the last two years. This research served as a basis for data collection and information on marine oil pollution in Chile. Many interviews were conducted with various marine consultants, the DIRECTEMAR, Institute of Oceanography, and private and public sector organizations.

The majority of my discussions and interviews involved policy development issues in the area of marine oil pollution. Efforts to ratify and comply with national, international, and regional policies, conventions and agreements which protect

the oceans and the marine environment in Chile were discussed and considered critical to Chile's development.

My case study involved research and data collection on the condition of Chile's ocean and coastal areas. This research will demonstrate how most of the hydrocarbon pollution in Chilean waters is due to intentional or unintentional errors (considered operational or accidental). This results from the lack of skilled people, whereas the handling of Chilean marine issues such as vessel management have been a major cause of oil pollution due to lack of training and educational programs. I will give examples of the different types of accidental spills I researched and how the institutions responsible tried to minimize the damage to the environment.

During my investigation I circulated a questionnaire which contributed to my research (this questionnaire is available from the author). This questionnaire focused on areas that are susceptible to oil spills, such as the Strait of Magellan, Valparaiso Bay and Concepcion Bay. These are areas where most shipping routes cross, and other installations and services such as oil refineries, industries, fishing and tourist resources are closely linked to one another and at risk to oil spills. Reference will be made to environmental studies being carried out in those areas and how some of the available results demonstrate that one of the

largest marine environmental problems is the creation of complex human made hydrocarbon products.

My research also deals with problems faced by the Chilean government to protect the environment, starting with very complicated and disjointed legislation and the lack of institutions dealing with the environment. This research included a review of the Plan de Contingencia para Derrames de Hidrocarburos² implemented by oil refineries and petroleum companies. The interesting work carried out by Captain A. Pizarro, Valparaiso, Chile, working in the field of marine oil pollution contributed to my research.

Another document that I reviewed and will be analyzed is the Protocolo sobre la Evaluacion del Impacto Ambiental en el Pacifico Sudeste³ and what will be required for the implementation of an environmental impact evaluation, before undertaking any activities and/or development projects that may negatively affect the marine environment and/or coastal zone.

My research indicates that in order to complement the framework to protect the marine environment, Chile had to reform not only its laws, but also its institutions. This study also demonstrates that the protection of the environment was internalised within the Constitution of 1980, where it

² *Oil Spill Contingency Plans*

³ *Protocol for the evaluation of environmental impact assessment in the South Pacific.*

was specified that Chileans have the right to live in a clean and healthy environment, free of contaminants (also recognized as a basic need). The changes made to the Law of Navigation which created the institutional framework stated clearly the duties and responsibilities of the Direccion General del Territorio Maritimo y de la Marina Mercante, most commonly known as the DIRECTEMAR.⁴ To give a full picture of the institutional framework, I researched how the DIRECTEMAR was organised and divided into five different regions, establishing a regional centre responsible for the preservation of the environment in each area. Programs such as:

- a) program to collect baseline data,
- b) program to better manage the coastal environment, and
- c) an educational Program.

D. Conceptual Framework

To address the research question my approach is to connect development and the environment within a policy and institutional framework and within a centre-periphery model of the world economy⁵. Within this framework and with reference to this model I will examine how global capital industrial

⁴ *Director General of the Navy, Coast Guard and Merchant Marine*

⁵ *This centre-periphery model provides the theoretical basis of Latin American structuralism, a school of thought associated with ECLAC and the CEPAL review.*

development resulted in an unequal distribution of economic benefits between the industrialised and non-industrialised countries, and domestically between the export and subsistent sectors⁶. I will also examine the duality of the system and how it resulted in a myriad of socio-economic and political problems in the periphery. I will further investigate how the rise of the environmental movement came to add more problems to the enigma of Third World development.

Developing countries are faced with a pressing conflict: on the one hand Agenda 21 and other international environmental protocols suggest that the United Nations address and solve the global environmental and developmental problems by creating a program of coordination and cooperation between the developed and underdeveloped world. On the other hand, we can see how instead the industrialised nations, through the IMF and World Bank have continued to press for the settlement of international financial debts, while disregarding the social and environmental debt to these countries.

Alternative approaches to development - from capital accumulation, basic needs, industrialisation, and modernisation - are examined from both political and economic points of view, and with reference to socio-political systems:

⁶ Appel, G. (1985). *Modernization and the emergence of a landless peasantry: Essays on the integration of peripheries to socio-economic centres*. College of William and Berry. Williamsburg, Va.

capitalism and state socialism. How both systems chose industrialisation as a path towards economic growth and how this impacted negatively on both the environment and society are important from an institutional point of view. I will discuss the socialist indigenous alternatives that were tried in attempting to create egalitarian, and truly democratic societies, but were devastated by forces of the international political order.

My approach involves an analysis of the international trading system from the perspective of an inward (Import Substitution Industrialisation) and outward (export promotion industrialisation) development strategies. Outward development will be expanded to include the present Neo-Liberal ideology otherwise known as the "miracle of the market". Additional problems include how this ideology is forcing third world countries, through Structural Adjustment Policies, to restructure their economies to promote economic growth, while postponing social reforms, until the time when the country is able to finance them with their own resources. Placing environmental interests within the present neo Liberal ideology presents several problems. Market prices are determined according to present forces of supply and demand which lacks consideration for future scarcity, and that natural resources appear to be free for the taking. The concept of free natural resources, combined with the ocean's ability to clean itself, and its vastness, made ocean waters

appear as a resource of infinite supply. However, oil spills have demonstrated the fragility of the system which is compounded by complex human made chemical compounds. The human race has negatively affected the seas by not only introducing complex substances into it, but research has also shown that a large proportion of ocean waters' contamination is due mainly to human error and ignorance.⁷ My argument considers the views of both the traditional and contemporary schools of thought. The traditional school of thought in resource management assumes unlimited capacities of ecosystems.⁸ Considering this case, ie. the marine environment, this would indicate that oceans can absorb wastes at unlimited capacity. On the contrary the contemporary wisdom is that socio-economic development cannot be pursued indefinitely without adversely impacting the environment.⁹ This view has been reinforced by the findings of the World Commission on Development and the Environment which proposes

⁷ The International Maritime Organization (IMO) estimates that over 90% of marine pollution incidents, concerning petroleum oil products, worldwide are caused by human error. Brander-Smith, Therrien, D., Tobin, S. (1990). Protecting our Waters: Public Review Panel on Tanker Safety and Marine Spills Response Capability. Canada.

⁸see Pepper. 1986. The Roots of Modern Environmentalism, London :Routledge.

⁹see Friedmann. 1992. "Empowerment: The Politics of Alternative Development", Cambridge, MA :Blackwell; and Goodland, R. 1991. Environmentally Sustainable Economic Development : UNESCO

that sustainable advancement is only attainable by linking development and the environment.¹⁰ To this end, the above mentioned commission has contributed an entire chapter of this report on Human Resource Development (HRD), to link the two objectives, development and environment. Therefore, the only solution to the present enigma, as will be shown in this thesis, is to explore strategies that will allow human resource development to assist countries to become self-reliant with their own ocean strategies and environmental management objectives.

Yet another school of thought on development, presented by classical economists such as Irving Fisher¹¹, consider knowledge and skills as part of the wealth of a country. Nevertheless, these factors were eliminated from all economic equations as most economic models deal mainly with capital and labour. But when real data were applied to these economic models, spurts of economic growth could not be attributed to only capital and labour. In the 1960's, Schultz,¹² and later in the 1980's, Romer and Lucas¹³ demonstrated in their studies

¹⁰ World Commission on Environment and Development. (WCED). (1987).

¹¹ Fisher, I. (1925). Mathematical Investigations in Theory of value and Prices. New Haven. Yale University Press.

¹² Smith, A. (1976). An Inquiry into the Nature and Causes of the Wealth of Nations. London.

¹³ Fisher, I. (1925). Opp.Cit.

that "Human Capital" is a factor affecting economic growth of a country. This explains the gaps previously discovered. Consequently, "Human Capital Development" can be the missing link between the need to preserve the environment as well as connecting social development and economic growth.

My approach is based on this concept, and on this basis I argue in favour of socio-economic development as long as adequate channels and institutions are provided to appropriately educate and train people, corporations and organizations to responsibly protect the environment from contamination and degradation. Social development, through education and nutrition, would improve the quality of human resources and learning while helping us become aware of the need to prevent further abasement of the environment. This would contribute towards sustainable socio-economic development. Humans must recognize the need for sustainable socio-economic development, and the need to preserve our ecosystems, in order to support industries such as fisheries and tourism on a long term basis.

"Social development and economic development are inseparable, and the neglect of one will inevitably be detrimental to the other".¹⁴

¹⁴ Inter American Development Bank. (1993). Economic and Social Progress in Latin America 1993 Report. Special Section Human Resources. p. 1.

D-1. Institutional Transformation in Chile

The negative socio-economic structures of early twentieth century Chile, lead the Structuralist school to examine the terms of trade between the centre and the periphery, and seek a strategy to secure higher proportions of the "social surplus" for the domestic economy. The consequences and mistakes of the Import Substitution Industrialisation (ISI) alternative are argued in this thesis, which includes a discussion of the negative characteristics of post ISI's Chilean economy.

On this basis, I will analyze the relevant factors that contributed to the political phenomenon of Chile democratically electing parties which promoted centre and left radical social change. The strategies implemented by the government of Eduardo Frei (Senior) government, to restructure the economy through conservative measures, combined with the positive international environment which favoured his government, was a positive turning point for Chile's political development. However, domestically, the situation was different and Frei was not able to satisfy the extreme factions of his party, which led to the defeat of the Christian Democratic candidate and the election of Allende's coalition of radical left parties.

Allende's reputation as a Marxist politician had preceded his actions, which changed international and domestic appreciation of Chile's political scene at that time. Some of

Allende's policies were used to increase the quality of professionals working with the State which strained government finances. As a result, global organizations and the international commercial banks refused to renegotiate Chile's debt, forcing them to finance it through domestic sources.

Pinochet's government, which followed Allende, adopted economic growth, freedom of the markets, and the Internal Security Doctrine (ISD) as the main goals of government. Social reform and opposition to the State agenda were seen as attempts against the capitalist system. I will discuss how the so called "Chicago Boys" with their doctrine of the "miracle of the market", took over restructuring Chile's economy. Pinochet's domestic unpopularity increased and this combined with international criticism lead to allow democratic elections to take place. Notwithstanding this, he remained as the guardian of the State, securing the predominance of the ISD, and maintained assurance against a potential return to radical socialist agendas.

We will see how the succeeding government of Patricio Alwyn did not change Pinochet's economic agenda, opting to use 'band-aid' solutions to social issues, through Structural Adjustment Policies (SAPS). Alwyn was forced to manoeuvre his socio-economic agenda around the vigilant eye of Pinochet and the Bretton Woods Organisations.

Finally a discussion on the present Christian Democratic government, lead by Eduardo Frei Jr. follows. This

government's promise to reduce absolute poverty and how this strategy does not offer a drastic change to the previous government, introduces the idea that Frei maintains private enterprise as the right arm, in order for the government to reach its goals. These goals include socio-economic progress but can this be achieved in harmony with the environment?

D-2. International Environmental Marine Policy Development

A discussion on developments in international environmental policy over the past three decades, and how they effected developing countries such as Chile is critical to my argument. Without these very important policies and laws there is no hope that environmental degradation of the marine sector will be curbed, and that socio-economic progress can continue without negatively impacting marine resources. The last three decades represented a shift by most countries from a national to a global focus when discussing international laws and ocean development, freedom of the seas¹⁵, and the impact of several sessions of the United Nations conference on the Law of the Seas (UNCLOS). This presents a discussion on the need for stricter rules and regulations and well defined laws protecting the international oceans. Several conventions, such as the United Nation Convention on the protection of Marine Pollution from Ships (MARPOL, 1973-1978), and the London Dumping Convention (1972/1975), are discussed

¹⁵ meaning freedom to use the seas

in an international context, and how they changed policy development and decisions about the marine environment in Chile.

Developing countries did not fully participate in the early process of the LOS conventions, only in 1973 were the concerns of developing countries included in the third UNCLOS conference. I will include a reference to how Latin American countries such as Chile convinced other Third World Nations of the importance of extending the 200-mile exclusive economic zone (EEZ). I will also deal with the LOS in Caracas (1974), where the first measures on policies to prevent marine pollution were drafted. A discussion of the reason that Third World countries were concerned about the cost of pollution control is also undertaken. These costs placed tremendous financial strain on these countries, making this point central to my argument concerning socio-economic development and its effect on the environment.

The role of Chile in these negotiations is also examined, as well as its involvement in the Comision Permanente del Pacifico Sur (CPPS).¹⁶ Information will be provided on the United Nations Environment Programme (UNEP), which strengthens regional approaches, and through which a Convention and Action Plan for the Protection of the Marine

¹⁶ *Permanent Commission in the South Pacific*

Environment and Coastal Areas of South-East Pacific were signed.

I will explain why the oceans were divided into ten different zones and how general rules for marine environmental protection, to which the signing countries have to agree and supply a dispute resolution mechanism, were implemented.

E. Organisation of the Thesis

Chapter One is an introduction to my problem, which also develops a conceptual framework to base my argument. Chapter Two is a literature review which I use to support the analysis of my thesis. Chapter Three is an historical study of Chile and provides an institutional framework for my discussion. Chapter Four is a policy based analysis, which defines the role of the state in Chile in the area of marine environmental policy development, and offers a list of policy recommendations. This chapter also develops my argument on the need for compliance and ratification to environmental regulations on a global basis which ultimately leads to socio-economic development and reduces negative impacts on the marine environment. The final chapter draws conclusions and lessons from the individual chapters.

CHAPTER TWO: LITERATURE REVIEW

A. Introduction

This chapter is a literature review which establishes a theoretical framework upon which to base my argument concerning the linkage between development and the environment. The foundation for my argument is built around an in depth review of the marine environment in general, and the marine environment in Chile in particular. In order to initiate an argument for this chapter, alternatives of development, human resources and economics are also discussed in a theoretical context. Finally, relevant ideas about the linkage between development and the environment are raised by posing a series of questions concerning Chile.

The great technical advances experienced by Western civilisation in the last century have dramatically improved the life of what is known as the developed world. Twenty percent of the global population benefited substantially from this process, while the remaining eighty percent continued to struggle to preserve their traditional way of life, battling against the push and pull of domestic and international forces that deemed the western way of life as the only model of development. Half of the worlds population live within six kilometres of the shoreline, and for small island states these areas are imperative to their development activities.¹⁷

¹⁷ IDRC. (1993). *Agenda 21. Chapter 17.*

As world population increased and the rate of consumption throughout the developed world reached unmanageable levels; the realisation of an impending environmental disaster became inevitable. The earth could not continue to provide the inputs required to maintain present levels of production, while simultaneously absorbing the waste produced through this system.

The environmental movement, intending to voice the need for sustainable development to preserve resources for generations to come, placed the Third World in a serious predicament. The majority of the inhabitants in many Third World countries benefited very little from the modernisation process brought to their lands by domestic elites, international development organisations, and multinational companies. In fact, any positive impact, such as improvement of life expectancy due to advancements in medicine, were negated by the destruction of their cultural values and traditions, the rise of dual socio-economic structures, and the degradation of their resources. Agenda 21 states that this,

"is a world where the developed industrialised countries... have pushed the earth's natural support systems to their limits, thereby limiting development potentials for the rest of the world. (Yet they) refuse to accept responsibility for their actions, much less the obligation to compensate for the damage they have done... (They also refuse to) provide the

necessary financial assistance to the developing countries to permit them to avoid the mistakes of the past"¹⁸

However, the international agenda appears to demand global interdependence and adoption of governmental policies that benefit only the North. Consequently, the opportunity for action by Third World governments to promote positive change, has become limited. Morally, the third world's greatest responsibility is the reduction of poverty, but global pressures by the International Monetary Fund, the World Bank, and Official Development Agencies (ODA), give precedence to the settlement of international financial debts, thereby continually placing further conditions on the already scarce funds provided. Although this problem is more complex and involves more than the pressures exerted by International Financial Institutions and bilateral organizations, Third World Countries are still being forced to over exploit natural resources, thereby negatively affecting both socio-economic development and the environment.

B. The Marine Environment

Over the years, different approaches have been used to deal with marine environmental problems. In the past, traditional approaches to marine environmental management was based on an assumption that the oceans had infinite capacities

¹⁸ IDRC (1993). *Agenda 21. Green Paths to the Future*. Ottawa. p.3

to absorb wastes¹⁹. It was assumed that the oceans had self-cleansing capacities and that there was no need for human involvement in managing the marine ecosystems²⁰. This assumption has led to the over-exploitation of the marine environment resulting in Hardin's (1968) ²¹ tragedy of the commons. Subsequently, marine ecosystems were subjected to various forms of abuse including dumping of industrial wastes, the disposal of municipal refuse, cleaning wastes from oil and other cargo ships, and pollutants from offshore and nearshore oil platforms. With time, however, it became evident that the assumed capacities of the oceans was misplaced, and that the marine ecosystems were beginning to show signs of strain; this stress was particularly evident in the case of marine living organisms. The vulnerability of the marine environment to degradation in its broader sense is now well documented. Contemporary marine management indicates that the open status (ref Nullius)²² assigned to the oceans have predisposed them

¹⁹ Freedman, B. (1989). Environmental Ecology: The Impacts of Pollution and Other Stressors on Ecosystem Structure and Function, San Diego and New York :Academic Press.

²⁰ Lele, S.M. (1991). "Sustainable Development: A Critical Review", World Development. vol. 19 (6). pp. 607-621.

²¹ Garrett Hardin. 1987. "Tragedy of the Commons" in Menard, S.E. and Moen, E.W. (eds). 1987. Perspectives on Population: An Introduction to Concepts and Issues, New York :Oxford Univeristy Press.

²² Bromley, D.W. (1984). Property Rights and Economic Incentives in Resource and Environmental Systems. Paper no. 231. Department of Agricultural Economics, University of

to competition from different nations and other competing interests. This status has led to inevitable non-sustainable development in most parts of the world. Developing countries territorial as well as their exclusive economic zones have been subjected to high loads of marine contamination of different sources.

It was in recognition of these problems that the United Nations initiated measures to regulate the utilization and maintenance of the marine environment, in the form of the popular 1982 Law of the Sea (LOS) Convention and other international conventions and soft law²³. The United Nations Law of the Sea (UNCLOS), discussed in detail in Chapter Four sets forth rules for accessing the marine environment with corresponding sets of expectations from various users. It also provides a mechanism for negotiating and interpreting the status of the seas among various nations of the world. Modern approaches to the management of the marine environment, including the UNCLOS and other mechanisms, are based upon the premise that many present day development trends degrade the environment and leave many people poor²⁴. It is argued that we require new types of development that sustain human

Wisconsin. Madison.

²³ Soft law in international environmental law refers to sets of principles and declarations adopted at various international gatherings, for example the declarations of the Stockholm human environment conference of 1972 and the principles set forth in the Brundtland Report.

²⁴ WECD (1987).

progress not just in a few places for a few years but for the entire planet into the distant future²⁵. This concern led to the adoption of the sustainable development paradigm by the United Nations General Assembly in 1987 following its recommendation by the World Commission on Environment and Development (WCED). The WCED defines sustainable development as development that meets the needs of the present generation while providing mechanisms for protecting the resources to meet the needs of future generations. Sustainable development is a process of change in which the exploitation of resources, (in this particular case, resources of the marine environment) the direction of investments, the orientation of technological development, and institutional change all are in harmony and enhance both current and future potential to meet human needs and aspirations.

C. Definition of Marine Pollution

In order to study marine pollution, it is necessary to consider the ocean as a dynamic system residing within a wider global environment. This is because not all contaminants found in the ocean were originally spilled directly into the ocean, but could have drained from the land, or fell as atmospheric precipitation.

²⁵ Redcliff, M. (1987). Sustainable Development: Exploring the Contradictions. London.

Consequently, marine contamination has been defined as the direct or indirect introduction of substances or energy in the ocean, that may: endanger human health, ocean's flora and fauna, degenerate the quality of ocean waters and coastal ecosystems, and in the process, interfere with the normal pursuit of human activities".²⁶

Non-organic marine pollution is created as a result of modern industrial processes in manufacturing, mining, agriculture and the use of non-biodegradable products in domestic activities.²⁷ All of these activities employ water to clean, cool, heat, dilute, process and eliminate waste, which is later drained into lakes and rivers, while gases are released to the atmosphere through evaporation returning to the land and water, as "acid rain".

Due to their toxicity, the spill of some substances is considered an immediate menace to human health and the environment; others are only dangerous in the long term. The latter problem is due to cumulative characteristics, and nature's inability to decompose them. Therefore,

²⁶ Rivera, J. V. (n.d.) Program de Education y Difusion Para la Preservacion del Medio Ambiente Marino y Dulceacuicola. Armada de Chile. Valparaiso. p. 9.

²⁷ The Chilean government claims that, for the most part waste water effluent and oil spills are the principle pollutant sources of the Chilean marine environment. Romilly, G. (1994). (personal communication).

petroleum is considered among the most dangerous, not only because of their toxicity, but also because of their wide use and the volume of their transportation.

The sensationalism and concentration of media reporting on major oil spills has created the false image that they count for a high percentage of hydrocarbon pollution. However, it has been estimated that accidental spills count for only 4%²⁸ to 10%²⁹ of total contamination. The type of ships, frequency of spills, area of spills, and other conditions are useful to scientists in order to derive data by "finger printing"³⁰ oil samples found in the ocean. The ship responsible for the spill can then be easily traced and fined.

Actually, scientists estimate that 70% of the total contamination of hydrocarbon substances, is the result of mistakes or intentional discharge during routine operations - loading or unloading crude and refined petroleum products in refineries, ocean terminals and the open sea, or from land sources through direct or indirect spills via natural or artificial water channels - as a result of domestic, shipping,

²⁸ Pantoja, S.G.; J.A. Becerra and M.O. Silva. (n.d.). "Estabilidad de los Hidrocarburos del Derrame, del B/T Cabo Tamar en la Bahía San Vicente, Chile", Facultad de Ciencias Biológicas y de Recursos Naturales, Universidad de Concepción, Chile, p. 2.

²⁹ Rivera, J. V. (n.d.) *Op Cit*; p. 17.

³⁰ Lawson, J. (1994). Canadian Coast Guard.

industrial, mining and agricultural waste³¹. Current approaches and management objectives have not always proven affective for achieving sustainable development, and coastal areas and resources are becoming increasingly degraded throughout the world.³²

D. Marine Oil Pollution in the Chilean Coastal Zone

The intensity and duration of news coverage of accidental releases of oil into the marine environment are not always related to the seriousness of the spill. Over 600,000 Tons of oil per year are either intentionally or accidentally spilled in the oceans of the world³³. Table 1, lists the oil spills that occurred in the main Ports of Chile in 1993. This table is useful in analyzing the frequency and types of oil spills in many of the ports that experience a huge amount of shipping and vigorous marine traffic in Chile.

³¹ Ripley, H. (1994). Ariel Geomatics Inc. Canada. (personal communication).

³² OECD. (1993).

³³ Organization for Economic Co-operation and Development (OECD). (1993). Coastal Zone Management. " Integrated Policies".

TABLE 1 MAIN SEA SPILLS PER PORT IN CHILE IN 1993

DATE	PORT	SHIP TYPE	NAME	FLAG
27 1 93	Punt Arenas	Oil Tanker	Stolt Boel	Norway
18 2 93	Punt Arenas	Fishing	Ryuon Maru 16	Japan
22 3 93	Valparaiso	Navy	Zenteno	Chile
17 4 93	Valparaiso	Cargo	Kamina	Bahamas
26 4 93	Talcahuano	Factory	Unzen	Chile
17 7 93	San Vicente	Fishing	Antonio	Chile
02 8 93	Caldera	Fishing	Atacama II	Chile
16 9 93	Valparaiso	Copec Truck	Truck	Chile
15 10 93	Valparaiso	Cargo	Aconcagua	Chile
22 10 93	Valparaiso	HMS	Scylla	U/K
02 11 93	Lirquen	Grain Cargo	Sunderland Sp	U/K
03 11 93	Puerto Montt	Ro-Ro	Malika	Bahamas
17 11 93	Puerto Montt	Copec Truck	Truck	Chile
22 11 93	Talcahuano	Oil Tanker	Obo Makedonia	Chile
25 11 93	Valparaiso	Cargo	Samra	Panamà
23 12 93	Valparaiso	Cargo	Hansa Visby	Germany

The level of activity along the Chilean coast, in comparison to major oil exporters (OPEC Countries) and importers (U.S.), is relatively low. However, Chile has had its share of large oil spills. Table 2, on the following page, demonstrates that despite increased documentation on spills in Chile, the frequency of spills is declining.

Table 2.

OIL SPILLS			
YEAR	ALL SIZES	6,800-68,000	> 68,000
1974	1,450	91	26
1975	1,350	98	23
1976	1,099	66	25
1977	956	66	20
1978	746	57	24
1979	695	54	37
1980	554	48	13
1981	401	48	5
1982	247	44	3
1983	216	52	11
1984	146	25	7
1985	137	25	8
1986	118	24	6
TOTAL	8,115	698	208

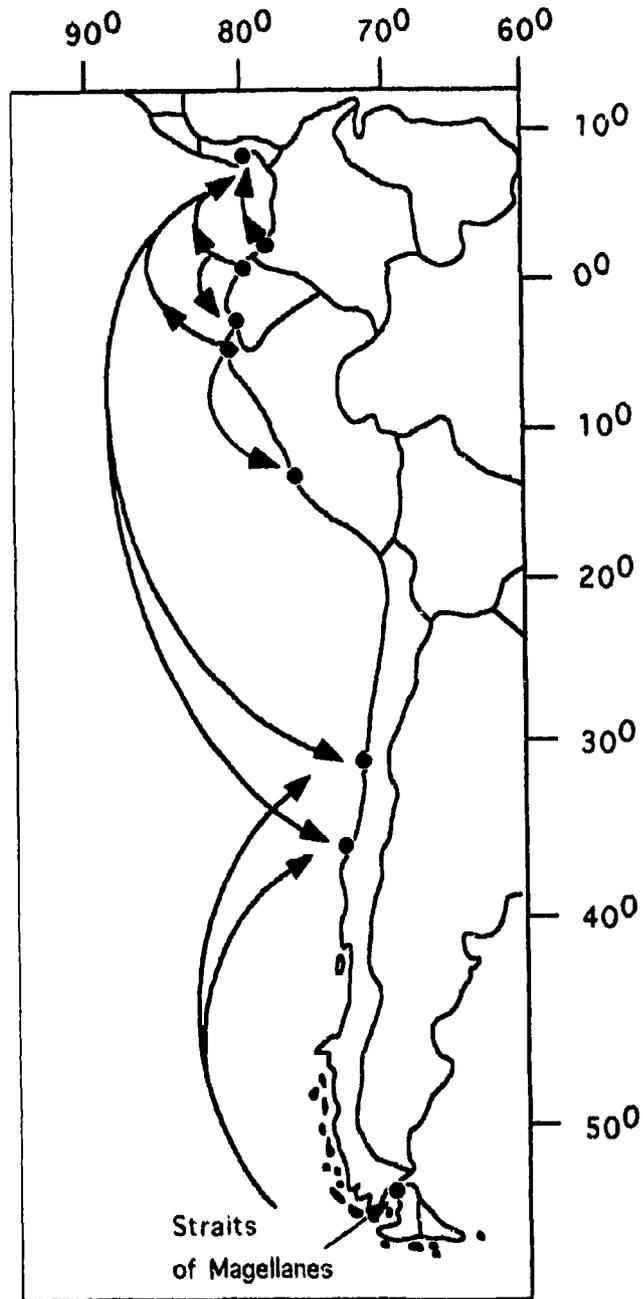
Chile has more than 1.6 million square kilometres of sea, and more than 700,000 Hectares of interior waters (rivers and lakes)³⁴. Chile's territory including Easter Island, is 4500 kilometres in length (excluding their Antarctic claim) and has more than 14,000 islands³⁵. These seas and waterways provide a tremendous resource for Chile, which could be devastated by an oil spill(s). Chile's marine environment has already been affected by a series of accidental spills. One of the biggest discharges took place in 1973, near the Island of Guamblin, in the southern zone of the country. The "Napier", an oil tanker ran aground, spilling 30,000 tons of Bolivian crude oil. Fortunately, the area where the disaster took place was in the open ocean, affected by harsh weather conditions, and far away from populated areas. The use of drastic measures, such as setting the vessel on fire, combined with the severity of the weather, reduced the harm to the environment.

A year later, Chileans were not as lucky. On August 9, the VLCC *Metula*, ran aground in the Straits of Magellan (see Fig. 1 next page) with the loss of 50,000 to 56,000 tonnes of light Arabian crude and 3,000 to 4,000 tonnes of Bunker C. This spill exceeds the amount released along the Alaskan coast by the Exxon Valdez in 1989.

³⁴ Chocair, J. (1991). A Report on Chile's Fishery Sector. "Prepared for the Canadian Embassy in Chile". Chile.

³⁵ *Ibid.*

Figure 1³⁶. Major Routes for Oil Transport



³⁶ After Ramorino. (1991).

The Chilean State was unprepared to confront such a disaster, and had to depend on the help offered by foreign countries. This took time to arrange and the delay led to needless contamination of the beaches and water inlets in the affected areas. This spill is still under investigation to this day. The International Convention for the Protection of Pollution from ships 1973 (MARPOL 73/78)³⁷ would have been very helpful here. This convention prevents discharges from ships at sea, and while in port, and enables signatories to require internationally accepted equipment and standards. Ninety-two percent of, the world's merchant shipping have ratified MARPOL 73/78³⁸ (Chile signed several annexes in November, 1994).

The real impact of such a disaster and the lack of preventative measures is on those people who live from the resources of these coastal areas. Economic and social "spin offs" are needed from oil transport but not at the cost of degradation to the marine environment. Why do many large shipping and Transnational Companies pollute coastal areas in Chile with no respect for the marine environment or the people who habitate these areas? The solution includes the need for

³⁷ International Maritime Organization (IMO). (1991). International Convention for the Prevention and Control from Ships (MARPOL) Consolidated Edition. IMO. London. 7-125.

³⁸ Brodie, D. and P. Nelson. (1992). "Pacific Regional Workshop on Marine Pollution, Prevention Planning and Response. p.44. Australian Maritime Authority. SPREP-IMO.

stricter international environmental policies and laws. This will be argued in greater detail in Chapter Four.

In 1978 another spill affected one of Chile's most valuable economic activities, the fisheries. The tanker, "Cabo Tamar", spilled 12,000 tons of Ecuadorian petroleum into the harbour of San Vicente. The action of the northern wind pushed the petroleum towards the southern and southeastern zones of the affected area, contaminating beaches and bays. Although the marine fauna was not affected, because of the faster reaction on containment measures, the damage to the fishing fleet and the time lost fishing, had a negative impact on the industrial sector and 500 artisan fishermen. The labour intensive nature of the cleaning activities helped to reduce the economic effect on the latter group, who were employed in cleaning operations during the time that the fishing activity was closed. It has been demonstrated that after seven years the natural hydrocarbons were practically degraded. However, in the samples collected, there has been an increase in the "peaks" of complex hydrocarbons. This further demonstrates the complexity of human made substances and the problem faced by those trying to control the environmental consequences of these petroleum hydrocarbons.

The result of an oil spill can be measured from environmental and economic audits. However, the actual costs relating to an oil spill would be difficult to assess accurately not only due to the many social and economic

impacts, but also due to undetermined costs and causes. The negative effects on the environment, tourism, fishing and other recreational activities that the public might suffer from an oil spill should be assessed and compensated for by reasonable and approved means³⁹.

Pollution of the sea by oil is one of the major areas receiving global attention due to increases in maritime transportation and potential harm to the coastal areas as well as the marine environment⁴⁰. Marine oil pollution occurring in Chilean waters can be attributed to three primary sources: shipping traffic, fishing vessels and oil exploration and extraction⁴¹. During 1987, marine traffic, including fishing vessels, was estimated at 7,800 ships, and the areas most susceptible to oil pollution are the Straits of Magellan, Valparaiso Bay and Concepcion Bay (Figure 2)⁴². Also see the following three tables⁴³, following Figure 2.).

³⁹ Geselbracht, L. and R. Logan. (1993). "Washington's Marine Oil Spill Compensation Schedule Simplified Resource Damage Assessment" in Proceedings of 1993 International Oil Spill Conference (Prevention, Preparedness, Response). Florida. p. 705-709. April, 1993. USCG-API-EPA.

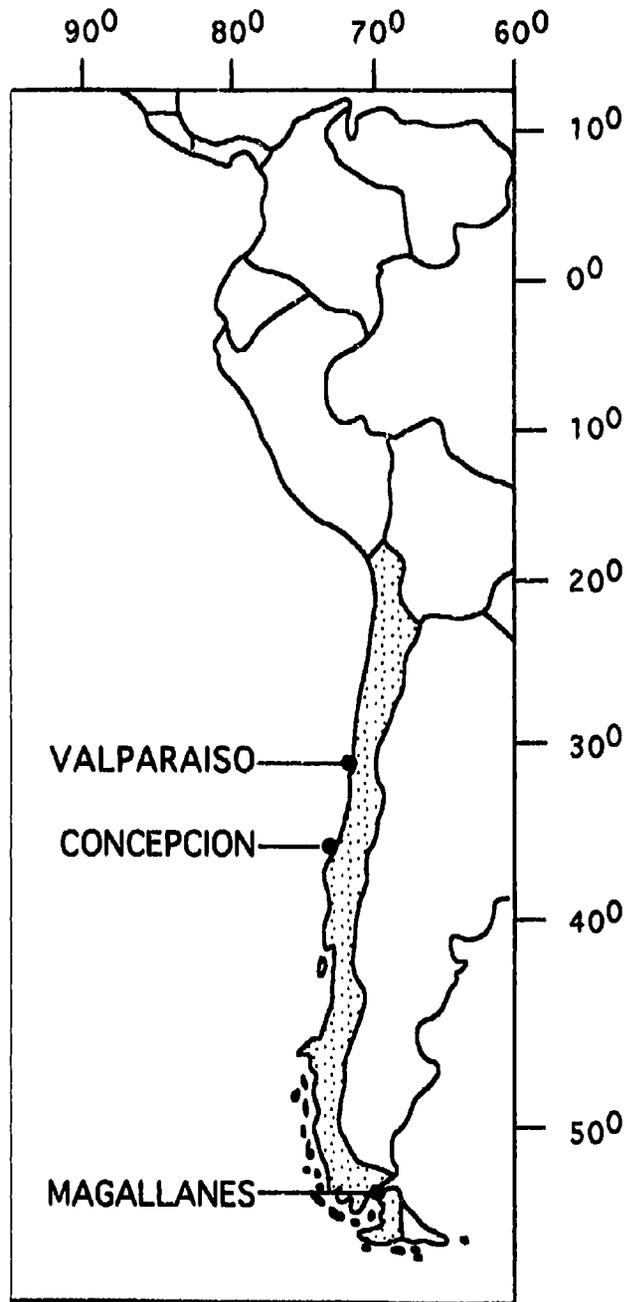
⁴⁰ UNEP. (1990). GESAMP. Report # 115. The state of the marine environment.

⁴¹ Trucco, R.G. and G. Bellolio. (1991). A Report on Environmental Issues in Chile. Prepared for the Canadian Embassy. Santiago, Chile.

⁴² After Ramorino. (1991).

⁴³ After DIRECTEMAR, (1991). Manual sobre La Contaminacion Ocasionada Por Hidrocarburos. Sample Edition, N. 200. Valparaiso, Chile.

Figure 2⁴ Areas most susceptible to oil pollution



⁴After Ramorino. (1991)

Table 3

Marine Zones		Type and Size of vessel	Criterion for Discharge
Outside Special Zones	< 12 marine miles from land	Petroleum tankers of all sizes and other large size vessels equal or greater than 400 ton. Other small vessels less than 400 ton.	NO DISCHARGE except when the content of hydrocarbon within the undiluted outflow doesn't exceed 15 ppm. Within reason try to apply the same criterion as with larger vessels.
	> 12 marine miles from land	Petroleum cargo of all sizes and other vessels of equal or greater than 400 ton. Other small vessels less than 400 ton.	NO DISCHARGE except when: <ul style="list-style-type: none"> a) The hydrocarbon content of the outflow does not exceed 15 ppm; or b) <ul style="list-style-type: none"> i) Vessel is on route; ii) the hydrocarbon content in the outflow is less than 100 ppm; and iii) the tanker has a mechanism of vigilance and control for unloading hydrocarbon and a separator or filter of water and hydrocarbon and other installations prescribed in Rule 16 App. I of MARPOL 73/78 iv) Referring to petroleum, bilge water do not come from cargo pump areas or are not residues from the hydrocarbon cargo. Whenever reasonable the same rules as those applied to equal or superior to 400 ton. should be used.

Table 4

Marine Zones		Type and Size of vessel	Criterion for Discharge
Inside Special Zones	Anywhere	Petroleum tankers of all sizes and other large size vessels equal or superior to 400 ppm.	<p>NO DISCHARGE except when:</p> <ol style="list-style-type: none"> 1) The vessel is on route; and 2) The amount of hydrocarbon in the undiluted outflow does not exceed 15 ppm; and 3) The vessel has a functioning hydrocarbon filter with an automatic shut-off system at hydrocarbon levels exceeding 15 ppm; and 4) Referring to petroleum tankers; that bilge water do not come from cargo pumps or are not mixed with residues of hydrocarbon cargo.
	< Less than 12 marine miles away from land	Non-Petroleum cargo vessels smaller than 400 ton	<p>NO DISCHARGE except when the content of hydrocarbon within the undiluted outflow does not exceed 15 ppm.</p>
	> 12 marine miles from land		<p>NO DISCHARGE except when:</p> <ol style="list-style-type: none"> a) The hydrocarbon content of the undiluted outflow does not exceed 15 ppm or b) <ol style="list-style-type: none"> i. Vessel is on route; and ii. the hydrocarbon content in the outflow is less than 100 ppm.

Table 5

Marine Zones		Criterion for Unloading
Inside a SPECIAL ZONE*		NO DISCHARGE except:
	< 50 marine miles from land	NO DISCHARGE except clean** or separated ballast
Outside a SPECIAL ZONE	> 50 marine miles from land	NO DISCHARGE except: <ul style="list-style-type: none"> a) clean or separated ballast; or; b) when: <ul style="list-style-type: none"> i. The vessel is on route; and ii. The amount of hydrocarbon discharged does not exceed 60 lbs per marine mile. iii. The amount of hydrocarbon discharged does not exceed 1/15000 (in old vessels) and of 1/30000 (in the case of new tanks) of total cargo transported in previous trip; and iv. The tanker has a functioning control mechanism of vigilance and control of hydrocarbon unloading and installation for tank cleaning as demanded in Rule 1 App. I of MARPOL 73/78

* Zones of high risk

** 'Clean ballast' is the ballast that has been cleaned to the point that its discharge does not show a 'sheen' and its hydrocarbon content does not exceed 15 ppm.

E. The Impact of Marine Oil Pollution on Coastal Zone Management and Development

The marine environment provides a very valuable resource to those living along coastal regions in Chile and contamination can have a long term negative impact on the ecosystems and industries, such as fishing and tourism, which they support. This contamination is for the most part due to oil spills, but to a lesser degree can be attributed to oil exploration. Although there has been some exploration for petroleum in Chile, no significant hydrocarbon resources have been found. Chile depends on imported petroleum for its liquid fuels, and is therefore constantly at risk to oil

spills. Refer to Figure 1 for an accurate layout of routing for tankers. Hydrocarbons penetrate the ocean and contaminate it in Chile in different forms, many of which are avoidable. All of these present problems for the coastal zones of Chile and the main identified sources are:

1. In sites of submarine petroleum drilling. Leaks due to natural filtration or because of damage, defects, mistakes during operational activities, or perforation in towers, platforms or vessels;
2. In vessels, while eliminating waste of fuel oil and/or contaminated bilge waters;
- 3.- In bunker tanks, during cleaning procedures of tanks and ballast, hydrocarbons may be accidentally or knowingly unloaded in the ocean;
4. In vessels other than bunker tanks, during the cleaning of ballast and liquid fuel tanks and/or during the discharge of ballast and cleaning waters;
5. During operations in petroleum loading terminals; where fuel can be spilled during loading or unloading of cargo, and/or during refuelling of vessels, including those moored or berthed outside the terminals;
6. During transfer of hydrocarbons from vessel to vessel;
7. Accidental spills when running aground, sinking, loading of tankers and other vessels that carry hydrocarbon as cargo or fuel;

8. Land sources, such as oils and other liquid hydrocarbon wastes;

9. And due to precipitation of hydrocarbons from the atmosphere.

As stated, many of these identified sources are avoidable. The increase in maritime activities in the coastal areas of Chile, combined with the quantities of imported hazardous and petroleum products increases the possibility of harmful discharges into the marine environment. Therefore, international and regional cooperation is needed in order to take the necessary measures promoting integrated coastal zone management and sustainable socio-economic development of coastal and marine areas, so that maritime activities can continue in harmony with the marine environment. According to Ricketts and Lemay⁴⁵,

"For a growing number of developing countries, especially island nations, coastal management has become one of the most important aspects of developing an effective sustainable development strategy".

In 1987 there were 37 oil terminals and 3 oil refineries in the Straits of Magellan. Oil production from 23 platforms was responsible for 30% of the total national consumption⁴⁶.

⁴⁵Ricketts, P., and Lemay, M. (1993). Canada's Role in International Development and Coastal Management: Recommendations for CIDA's New Responsibilities in Coastal and Ocean Management. "Proceedings of the Eighth Symposium on Coastal and Ocean Management". New Orleans, Louisiana.

⁴⁶ Trucco, R.G. and G. Bellolio. (1991). Op Cit.

The coastal region of Valparaiso Bay has a population of 600,000 and represents Chile's largest tourist location. As well, shipping is an important industry representing 20% of the national total. Valparaiso Bay is also the site of the Con Con oil refinery which produces gas, solvents, gasoline, kerosene, diesel and asphalt⁴⁷. Concepcion Bay (Fig. 2), with the second largest population in Chile (pop. >1.5 million), is an important industrial centre with an oil refinery and is also home to a large fishing fleet⁴⁸. This region cannot afford a major oil spill, since the effects would be devastating to the economy and the environment. Although shipping is an important industry in Chile, the socio-economic benefits derived must not be achieved at the cost of polluting the marine environment. The long term effects are devastating to the marine environment which prevents responsible and sustainable socio-economic development. For example, a marine oil spill could devastate the aquaculture industry, which is a multi-million dollar resource for Chile and a classic example of sustainable development⁴⁹.

⁴⁷ Fonseca-Truque, J. (1988). "Achievements in the development of The Action Plan for the Protection of the Marine Environment and Coastal Areas of the South East Pacific".

⁴⁸ Ibid.

⁴⁹ This is described in the Action Plan for the protection of the Coastal Areas contained in the proceedings for the First Environmental Protection Plan in the South East Pacific.

An aesthetically and ecologically improved coastal zone in Chile, is desirable since this will support industries such as tourism, fishing and aquaculture, providing local employment and long term socio-economic gain. This supports my argument that sustainable socio-economic development is only achievable when added measures are taken to protect environments such as the marine one. Further to this, hydrocarbons that remain in the ocean have a devastating effects on

"some marine living resources and some unique marine features and regions e.g. coral reefs, coastal wetlands, coastal rainforests⁵⁰".

A review of this important condition is critical to understanding the negative impacts that oil has on resources in the ocean which are harvested for economic gain and social "spin offs" along the coastal areas of Chile. It should be evident that disregard for the marine environment, as in the case of oil spills not only restrains but prevents socio-economic development. As stated earlier, a spill of tens of tons of oil could negatively affect the tourism and fishing industry in Chile, and as a consequence, have a devastating impact on Chile's overall economy and development. When considering the Braer oil spill off the Shetland Islands, it was found that the oil not only degraded the marine environment, but also impacted the economic and social

⁵⁰ OECD. p.45

conditions. Since many world markets assumed that the salmon off the Shetland Islands were tainted with oil, they immediately stopped importing salmon from there. In fact scientific tests proved that the salmon was not tainted at all. This exemplifies the uneasiness of the market, as well as the socio-economic repercussions of an oil spill. Chile largely depends on its salmon resource, and is a world leader in this regard (second to Norway). An oil spill would be devastating to Chile's salmon industry, and in that regard Chile must be ready to deal with one. The response and handling of oil spills in the coastal zone is a national responsibility and in Chile's case the DIRECTEMAR has full responsibility.

When correctly considering the ocean as a body within a wider system, it becomes evident that pollution control could be possible if all those intervening in the production, cargo, transport and use of toxic substances including hydrocarbons, understand what happens when petroleum hydrocarbons are spilled in the ocean. Further to this, when considering the definition of marine pollution, it becomes clear that oil contamination interferes with the normal pursuit of human activities. Chile urgently requires protective and preventative measures against oil spills, which could be initiated not only through the legislative process but also through an Integrated Coastal Zone Management program, which is imperative to socio-economic development in Chile.

"Coastal areas must be managed for sustainable development in order to maintain and enhance the livelihood of coastal communities, and as population and economic pressures increase it becomes more difficult and challenging to achieve sustainable development in the absence of proper management through the development and implementation of integrated coastal resource management programs"⁵¹.

F. Alternatives of Development

Countries striving for development have been puzzled by the multitude of models offered by developed nations to secure socio-economic progress. The problem arises from the interdisciplinary nature of the process and the lack of a clear definition of development. What really constitutes development, and what comes first, social or economic development? Dudley Seers for example, asks; "Why do we confuse development with economic growth"⁵²? Seers argues that development is a normative concept, almost a synonym for improvement. Development, therefore cannot be limited to economic improvement by itself.

If we try to analyze the socio-economic development models used during the present century, we find that at specific periods, the pendulum swings politically from capitalism to socialism. However, regardless of political alternatives, the strategy for economic growth remains static. Industrialisation and modernisation are considered by both

⁵¹Ricketts, P., and Lemay, M. (1993).

⁵² Seers, D. (1969). The Meaning of Development. P.6. "The Political Economy of Development and Underdevelopment" ed. by C.K. Welber. 1973.

political options as the exclusive and necessary path by which economic and social development can be reached.⁵³

However, the adoption of industrialisation meant that the traditional harmony between indigenous people and nature had to be abandoned⁵⁴. Modern modes of production forced people to abandon dependence on nature, and to accept the notion that the world's resources had been put on earth for their own use and disposal. The nature of industrialisation requires production to be at a continuum path towards growth. Therefore, the concepts of sustainable use of finite natural resources and acceptance of their limited capacity to absorb waste, tend to be obliterated.

*"This has resulted in the transfer of technology and the modernization of productive capacity greatly needed to compete in world export markets"*⁵⁵.

The cost of importing science and technology can be quite high for a country undergoing industrialisation.⁵⁶ This includes the use of complex techniques, machinery, technical division of labour within units of production, diverse range of skills

⁵³ Pieterse, J.N. (1992). "Dilemmas of Development Discourse" Development and Change. Vol. 22, s-29.

⁵⁴ Thrupp, L. (1990). "Politics of Sustainable Development Crusade: From Elite Protectionism to Social Justice in Third World Countries" in Environment, Technology and Society. no 58.

⁵⁵ IDB. (1993). Economic and social progress in Latin America Special Section: Human Resources. 1993 Report. p.1.

⁵⁶ Alvares, C. (1992). "Science". The Development Dictionary. Sachs, W. (ed). Led Books Ltd. London.

within the workshop, and the use of hydrocarbon energy. Consequently, the propensity for hydrocarbon pollution in a country grows in direct proportion to the growth of petroleum consumption or volume of transportation, due to industrialisation and/or the exploration of petroleum sources.

In the social field, industrial production has no connection with basic needs, but rather with commercialisation and the accumulation of capital or profits. Society is continuously reformed and transformed, seldom leading to social development, unless a concerted effort is instituted into the system, such as is the case in Sweden.

Two social classes are indispensable in an industrialised system, the entrepreneurial in the capitalist system, and in the Communist Party, the working class. Under this arrangement, the working class in both the capitalist and communist alternatives is lacking a means of production other than their own labour, and have no choice but to sell their labour to those who hold the means of production.

To finance further growth, a high proportion of the 'labour surplus' is retained by the owners of the means of production, thereby institutionalising the exploitation of the labour force.

" W.Arthur Lewis believes that in several underdeveloped countries there are virtually unlimited supplies of labour which can be used for capital formation. He also assumes that the capitalist class, which owns the reproducible capital, has

a propensity to save and reinvest a large proportion of its profits⁵⁷".

The degree to which welfare policies manage to reduce skewness in the distribution of wealth among the different social groups, determines the degree of social development within the society. Some of the developed nations, by institutionalising Keynesian policies within the capitalist system, manage to dilute some of the worst aberrations of the system. But since the international financial crisis of the 70's, Keynesianism has come under attack, especially due to the growth of the State apparatus.

Under the communist system, the private entrepreneurial class was eliminated, but the masses continued to be oppressed, since the State's highest priority was not the creation of a classless society, as promoted by Marx, but rather the justification of Communism through the conversion of Russia to a world dominant power. As such, 'labour surplus' was not distributed among the masses, or even the industries, but rather used to finance military pursuits of the State. In that way, Russian communism became as dangerous to society and the environment, as unbridled capitalism, because both chose industrialisation as the path to economic growth, while social development was perceived as a secondary

⁵⁷ Bhargava, R. and Iichman, W.F. (1966). pp.32-33. Balanced Thought and Economic Growth, in "The Political Economy of Development and Underdevelopment". 1973.

goal and would eventually be achieved as a result of higher wealth in the economy.

Socialist countries, such as China, Vietnam, Cuba, Nicaragua, Angola, Guinea-Bissau, Mozambique, and Zimbabwe, on the other hand, based their strategy on providing ample participation to the grassroots in the State's political, social and economic decision making. This allowed for a better distribution of the 'social surplus', leading to a more egalitarian society, more equitable income distribution, and more stable social structures. But the opposition of the international order that perceived the adoption of such a scheme as an affront to their own style of development, did not allow for the experiment to fully unfold nor to allow development practitioners to appreciate the results.

As Noam Chomsky⁵⁸ points out, successful social and economic development outside the U.S. framework could not be allowed to succeed, because it would point a finger at the inequities of the capitalist system. This would be noticed by the poor and oppressed people everywhere. According to Chomsky, this is the real meaning of the "Domino Effect Theory" and the worst enemy to capitalism.

The effect of this socialist alternative on the environment was not observed. Although we can safely state

⁵⁸ Chomsky, N. (1987). On Power and Ideology. Black Rose Books. Montreal. Canada.

that the effect would have depended on whether or not their production process was maintained, as a small-scale indigenous basic needs production; it begs the question: whether or not ideas of modern industries entered into the equation?

The promoters of ISI believed underdevelopment is the result of the inequities inherent in the international trading system. Latin American countries such as Chile historically experienced negative trade; the value of their exports decreased, while northern manufactured products continuously increased in price. This has meant Latin American countries have constantly been forced to increase production, in order to maintain equal or higher levels of earnings than in the past. Raul Prebisch for example, investigated the flaws of ISI and came up with one remedy where he

*"encouraged exports of manufacturers from the newly emplaced industrial sector.....and advocated a Latin American common market."*⁵⁹

The Dependency School recommended that Latin American countries manufacture domestically, those commodities presently being imported, in order to retain within the country part of the economic surplus that normally is transferred to the north. This was not a unique strategy, but rather a version of industrialism, emphasising the need to become more self-sufficient and reduce the dependency on

⁵⁹ Prebisch R. (1984). *"Five Stages in my thinking on Development"*, in Meier, G.M., and D., Seers. (eds). *Pioneers in Development*. Toronto: Oxford University press. p.194

northern production. The dependency theory received much of its support in the late sixties and early seventies, when many views on the process of satellitizations and internal structures conditioned by international relationships of dependence were given. Prebisch states that

*"the economic interest of the dominant groups of the centres form a cluster with strategic, ideological, and political interests in the centres, giving rise to stubborn forms of dependency in centre-periphery relations."*⁶⁰

Nevertheless, mistakes were made. Just as Keynesianism required the State to play an important role, this method was a technocratic top down approach through economic planning and incentives to production. As such, the ISI encountered problems of polarisation of society, and lack of distribution of the economic benefits derived from development. Additionally, because of the type of production implemented, they faced limited domestic markets and dependency was never broken because of the continuous reliance on inputs and imported capital goods.

The Neo-Liberal School opposes everything promoted by the ISI, and they believe there is no such thing as underdevelopment. The lack of economic growth is always caused by controls and restrictions placed on the market by the State. Precisely, the institution considered to be the promoter of development by the ISI, becomes for Neo-Liberals, the creator of bottlenecks to economic growth. According to

⁶⁰ Prebish, R. (1981). The Latin American periphery in the global system of capitalism, p.144. CEPAL Review.

Prebisch⁶¹ this neo-classical/neo-conservative theory presented a series of attacks on the structuralists' ISI and the inward-directed development strategy for the periphery. But this was viewed in the same light as ISI and Keynesianism, since Neo-Liberals deny the grassroots participation in decision making. Under this alternative, the markets make all the decisions. The 'invisible hand' is the "miracle maker", but unfortunately only those whom have money participate in the benefits of this great wonder.

Free markets and international trade are, for the Neo-Liberals, the motor of economic development. The vastness of the international market presents to all countries, an incredible opportunity for economic growth where all can benefit when making use of their comparative advantages. As a consequence, Latin American countries are assigned the place of primary producers of raw materials, cash crops for the North, and cheap labour for the labour intensive stages of production of transnational companies.

This strategy's highest goal is to change the country's economy to the point that they earn enough hard currency to pay their international debts and are able to become reliable consumers of northern imports. Social development and environmental management are considered a luxury at this stage; therefore, basic needs have to wait until equilibrium

⁶¹ Prebisch, R. (1980). Towards a theory of change. CEPEL Review. 1980.

is found in the international markets. The experience of countries facing this type of reform is exactly what the proponents of the dependency school asserted. Over production of raw materials by Third World countries creates gluts in the market, to the point that economic gains are drastically reduced, while northern manufactured goods become more expensive because of international inflation and the continuous devaluations of domestic currencies, promoted by the Neo-Liberal reform.

The fast recapitulation of development models, has demonstrated quite clearly that unbridled industrialisation leads to both lack of social development and degradation of the environment. Therefore, to obtain a level playing field, where both socio-economic and environmental sustainability is considered, we have to opt for a completely new alternative that places humans and the environment at the centre.

G. Human Resource Development and the Environment

The factors that have contributed to the failure of industrialism as a path to holistic development, is based on the same aspects that identifies this strategy. First, capital wealth, but never needs, determine the ability of the individual to fully participate in the benefits derived from economic growth. Consequently the market forces, demand and supply, are the yardsticks that measure the value of things. Additionally, the industrial strategy firmly believes

that technology can solve all problems, including those related to scarcity and environmental degradation. This is a view that collides with environmental concerns for the future, and the cyclical interdependent character of all resources with nature.

Since industrialisation is based on the precept that all natural resources are placed in the planet for the expressed purpose of being used and exploited by the human race, (the traditional school) they are not by themselves assigned intrinsic values. They are considered "free" to use and/or abuse, as long as a profit can be made. From my point of view, this is purely a capitalist based concept, that demonstrates disregard for social, economic, and environmental development. My argument does not support this school of thought, and I will argue in favour of socio-economic development strategies that offer respect towards the environment.

Its vastness, is precisely why the ocean and marine environment have throughout the ages been considered to have a never-ending yield. Consequently, it has become one of the world's most abused natural bodies. As explained earlier in this chapter (the traditional approach), the marine ecosystems capacity to restore itself has greatly contributed to this view and forces of nature have, up to now, been able to process quantities of naturally biodegradable products. The main reason for contamination of the ocean, is simply the

mishandling of operational activities, such as cleaning and disposing of residues left in tanks and decks of ships, further compounded by human operational error.

"To stay alive people destroy the very resources they will need tomorrow. Without proper respect for the environment, no development strategy can lead to long-lasting, sustainable development".⁶²

Nevertheless, in the past twenty years, the increase of trade and industrialisation throughout the world has resulted in a higher demand for hydrocarbon energy, increasing the number of exploration platforms, adding to the volume of oil being transported and the shipping traffic in the oceans. Increasing possibilities of intentional or unintentional spills of complex chemical components far exceed the capacity of the ocean to dispose of them. Prior to the last five years there was very little investment in training personnel to deal with the prevention and protection issues related to oil spills in Chile. Only within the last year has a legislative framework towards a National Environmental Policy (NEP) for the protection of the environment been established in Chile. Therefore the DIRECTEMAR has only recently been given the authority and (meagre) financial resources to effectively train people.

Within the last two years the decision-making bodies have acted in a co-ordinated and integrated way to minimise the

⁶² CIDA. (1987). Sharing Our Future. Ottawa.

costs and losses directly related to oil spills due to lack of training. Some of the areas where training is lacking are:

- Ship and Port safety
- causes and impact of spills
- prevention and response capability
- clean up and equipment procurement and operation
- inventory and assessment of equipment
- implementation of oil spill contingency plans
- legislation and policy implementation
- reporting, and enforcement capability

Oil pollution preparedness exercises should be implemented and conducted to ensure that key responders are trained to effectively respond to any oil spill incident in Chile. Chilean marine personnel lack adequate training in oil spill equipment operation and maintenance, clean up procedures, crisis management and communication skills. This could be corrected by having regular regional training workshops or by sending personnel to countries that have established, effective response and preparedness procedures relating to oil pollution. Investments in human capital where training is at the centre, in order to curb all possibilities of oil contamination to the marine environment, is essential but for the most part is lacking in Chile.

"The past four decades of development experience show that appropriate government policies for human resources are

as critical to development as macroeconomic stability, global competitiveness and physical infrastructure".⁶³

Despite the growth in the environmental movement since the 1980's there has been a resurgence, both in developed and underdeveloped countries, of the importance of the market, capital, and economic growth. Therefore, industries looking for cheaper factors of production and less stringent environmental restrictions, have been moving their industries to southern countries, that desperately need hard currencies to pay their international debt. Mining in Chile is a current and typical example of this, but the exploitation of the marine environment is also apparent in that country.

All these factors have contributed to people, industries and the State turning a blind eye to the limitations of nature to deal with human created complex chemical components. Therefore, we can conclude that a better use of resources, both natural and economic, can be accomplished by the application of human resource development. As said by Oshima,

*"It has become axiomatic to say that human capital formation plays a strategic role in the interplay of factors in development"*⁶⁴.

An extensive educational program aimed at increasing the knowledge of the general public, the operators of vessels, port managers, industries and the State could contribute to

⁶³ IDB. (1993). Economic and Social Progress in Latin America. 1993 Report. P. 188.

⁶⁴ Oshima, H. (1991). Human Resource Policy and Economic Development. p. 357.

reducing or eliminating contamination due to human factors. Consequently, this will contribute to an improved marine environment and the conservation of valuable resources.

H. Connecting the Environment and Human Resource Development

Agenda 21 suggests that the best strategy to protect the environment and secure sustainable development, is through training and education; by incorporating sustainable development concepts into all levels of education and for all groups of society⁶⁵. However, the concept of social programs as understood by Keynesianism and Socialism will have to be expanded to include,

*"management and reproduction of resources whose value is based on scarcity and the reproduction and conservation of natural resources; and the acceptance that personal development cannot exist where there is poverty, unemployment and inequality, because there is no economic development if there is no human and social development."*⁶⁶

Therefore, to effectively address environmental issues it is necessary to improve the quality of life and alleviate poverty of people living along the edges of oceans and waterways (coastal zones). Promoting ocean management strategy through human resource development would result in a myriad of benefits: empowering communities, increasing

⁶⁵ IDRC, (1993). Agenda 21. Green Paths to the Future. Canada.

⁶⁶ Morales-Gomez, D. A. (1993). "The Social Challenge in Development. From Economic to Social Policies", Research on Social Policy: Proposals for a Future Agenda. IDRC. Canada.

educational levels reducing pollution, raising standards of living, alleviating poverty, and reducing costs of coastal zone management projects (CZM).

*"A development strategy informed by this perspective must make efficient use of those resources which happen to exist in that particular area, in a way that both sustains the ecological system (outer limit) and provides the people living there with their basic human needs (inner limit)."*⁶⁷

Consequently, the best strategy to protect the marine environment and secure sustainable development, is by the promotion of development models that can reconcile economic, social and ecological efficiency, through training and education into all levels of education and for all groups of society. This will require:

a) the revision of the existing schooling system, textbooks and materials used to incorporate indigenous sustainable development concepts; and

b) expansion of both schooling and training programs to cover a wider range of the population above school age.

Therefore,

"..the reconciliation between society and nature must ultimately begin with values assimilated into the attitudes of the inhabitants of this planet. This is how it was in the communities that preceded modern civilisation, whose respect for the environment was one of the basic values embedded in their cultures and religious convictions. Those higher values

⁶⁷ Hettne, B. (1990). Development Theory and the Three Worlds. p. 187.

*must be recovered and transmitted through a new educational system that makes respect for nature a social value."*⁶⁸

I. The Classical Economists

Classic economists such as Adam Smith⁶⁹ and Irving Fisher⁷⁰, had considered the existence of knowledge and skills as part of the wealth of a country. This view, nevertheless, was abandoned because it seemed to reduce humans to a mere material component, akin to property.

As a consequence, since that time most economic models used only three factors of production: labour, capital and land. But, since land was considered a fixed asset, not affecting production, it was eliminated from most economic equations. Therefore, most economic models dealt only with trends affecting capital and labour. Labour, however, was seen as the act of production, something kindred to merely human physical energy, requiring neither knowledge nor skills. Consequently, when economists tried to apply these models to real data, they found that these factors of production were not enough to justify the dynamism of developed economies.

⁶⁸ *InterAmerican Development Bank-Environmental Committee. (1992). Annual Report on the Environment and Natural Resources. p. 30.*

⁶⁹ *Smith, A. (1976).*

⁷⁰ *Fisher, I. (1925).*

Vacuums of unexplained growth were prevalent. The possibility of time lags in the business cycles were considered, but failed to justify the difference.

During the 1960's, Theodore W. Schultz revived the notion of human capital as a contributing variable to the production process. According to him, "Human Capital"⁷¹ represents the quality components of labour such as: skill, knowledge, health, nutrition, organisation, management techniques and other attributes affecting human productivity. To "prove" Professor Schultz's hypothesis, Dr. Odd Aukurst⁷² applied the "human factor" concept, using data from Norway during the period 1900-1955 (excluding the war years.) The following conclusions were arrived at:

1. An increase of 1% in the amount of real capital will, if there is no change in employment and organisation, lead to an increase of 0.2% in national product.
2. An increase of 1% in employment will, if capital and organisation remain constant, lead to an increase of 0.7% in national product.
3. If capital and employment remain constant, national product will increase 1.8% per year as a result of the human factor. i.e., gradual improvement in skills, organisation and techniques.

⁷¹ Schultz, T.W. (1981). Investing in People: The Economics of Population Quality. University of California. Berkely.

⁷² Aukurst, O. (1971). "Investment and Economic Growth", in Investment in Human Capital. University of South Carolina Press. p. 96.

Applying these results to the period 1948-1955 when Norway's economy had increased approximately 3.4% a year, employment gained an average of 0.6% and capital increased by 5.6%, it was found that growth was caused by :

Increased employment	$0.76 * 0.6 = 0.46 \%$	/ year
Increased capital	$0.20 * 5.6 = 1.12 \%$	/ year
Human capital		$= 1.81 \%$ / year
TOTAL		$= 3.39 \%$ / year

Although, the studies mentioned include only data from developed economies, Professor Aukurst believes that the lack of "Human Capital" in the Third World, has been the factor determining the lack of financial capital absorption. He points out that in the South, investment funds have been available to finance physical infrastructure, equipment, and inventory, but little consideration has been given to human resource development. Therefore, skilled, healthy and organised human resources are scarce and remain behind physical capital, creating a bottleneck for sustainable economic growth. Human development

*"is a process of enlarging people's choices, of creating a conducive environment for people, individually and collectively, to develop their full potential and to have a reasonable chance of leading productive and creative lives in accord with their needs and interests."*⁷³

Third World governments and International Development Agencies have been aware of the necessity to promote education, training and health programs, but these activities have been

⁷³ UNDP. (1990). Human Development Report. New York.

classified as social programs; current expenditures diverting funds from more important investment activities. Consequently, they have not been given priority in the distribution of capital resources.

However, after the sad ten years of experimentation with stabilisation and adjustment in the Third World, even Neo-Liberal academics have come to accept that,

*"human resources are central in the growth process, and that active policies to favour human resources have a growth payoff because of the externalities and increasing returns associated with such investment"*⁷⁴.

In 1986 and 1988, Romer and Lucas, in separate publications⁷⁵, studied the importance of "Human Capital" as a variable that may affect the growth potential of a country. Romer says knowledge is produced with diminishing returns, but with positive externalities in the form of productive benefits for others beyond the teacher and student, since knowledge is disseminated through contact with others and seldom kept secret. Lucas, on the other hand, sees knowledge as producing sudden growth spurts and multiple equilibria growth paths.

⁷⁴ Inter American Development Bank, (1993). Economic and Social Progress in Latin America. 1993 Report. Special Section on Human Resources. p. 196.

⁷⁵ Romer, P. (1986). "Increasing Returns and Long Run Growth" Journal of Political Economy. Vol. 94, p.5.
Lucas, R. (1988). "On the Mechanics of Economic Development" Journal of Monetary Economics. p.22.

Considering that the reduction of government expenditures in education, health, sanitation, and nutrition plays an important role in the quality of human resources, a link has been made between short-term social effects and the long-term development potential of the country. Therefore, it has at last been proven economically that by bettering the standard of living and the skills of people, they are able to lift themselves out of poverty, and given an initial per capita real income, are able to adapt better to changing markets and technology. A better standard of living, with increased education and skills will inevitably lead to more concern for the environment, resulting with sustainable socio-economic development.

J. Posing Questions to Chile

The question for Chile, therefore, is how can they, under the imposed international Neo-Liberal agenda:

- 1) settle international financial debts;
- 2) promote socio-economic development;
- 3) protect the environment;
- 4) govern democratically; while,
- 5) improving the life of all its inhabitants.

Under present conditions these goals are seldom complementary, and when not properly designed and implemented often lead to completely opposite outcomes. This has forced governments to manage crises (such as marine environmental

disasters) as they occur, ranking objectives in the order shown above. Therefore, as the above hierarchy is integrated into the global agenda, the basic principle of development to *place people first and above all other requirements*, loses importance in the governmental scale of priorities. In terms of the marine environment, it is imperative that people be placed at the centre of development. In order for people to secure adequate livelihoods, and receive proper training on environmental management of marine resources, these five questions must be dealt with considering present issues. When people become self reliant and have their own basic needs secured, they will inevitably benefit individually, but will also assist the state with its marine environmental goals, preserve the environment and provide basic needs for future generations. This is sustainable socio-economic development.

The challenge for international development practitioners promoting environmental responsibility in the Third World, therefore, is not to lose sight of the obstacles faced by Third World governments. *The object of development is PEOPLE*; this should be at the forefront with everything else being a complement to the effort of improving living conditions for society, rather than competing or taking precedence over it in the distribution of scarce financial resources.

K. CONCLUSIONS

Oil pollution continues to threaten the marine environment, which negatively affects socio-economic development. The economic and social costs of spills can be very large indeed, and include loss of living resources of commercial value, loss of tourist income, damage to ecosystems, reduced amenity value and high clean up costs. The traditional school of thought which assumes unlimited capacities of the worlds ecosystems must be disposed of, in order to deter pollution of the marine environment.

Since the cumulative effects of complex hydrocarbons which are either intentionally or unintentionally introduced into the Chilean oceans and coastal zones, are having drastic affects on the environment and economy, zero tolerance of this activity must be initiated. In order to achieve this, an understanding of marine oil pollution is required as well as a strong commitment to implement policies and laws to stop it.

Alternatives of development should include more than simply importing science and technology to Chile. One solution to this enigma is to advocate HRD strategies which will encourage self reliance and realistic ocean and environmental management programs, which will result with sustainable socio-economic development.

Chile has made tremendous efforts in advancing economically while pursuing democratic institutions of government. However, in order to achieve sustainable socio-

economic development on a long term basis, this country must not only strive for institutional transformation, but also must encourage responsible environmental management principles and policies.

Considering that unbridled industrialization can deter social and economic development while at the same time degradate the marine environment, I concluded that placing people and the environment at the centre, as the principal subjects of progress will lead to sustainable development on a long term basis. Several questions can be posed to Chile with regard to development. However, all these questions equate to a willingness not only on behalf of the state, but also of the people themselves to endeavour to become self reliant and learn to protect and respect the environment.

CHAPTER THREE: CHILE - A CYCLICAL PAST TO A STABLE PRESENT

A. Introduction

Chapter Three provides a historical background of Chile over the past several decades. This is important to my argument as it articulates the many intervening factors that either postponed or lead to disregard towards the environment in Chile. In order for the marine environment to be understood in an institutional and historical context, this chapter is argued considering the social, political and economic issues that challenged Chile over the past three decades. During this period a focus was placed on the social, political, and economic realities that challenge development in Chile, and since government was preoccupied with these issues, disregard for the environment resulted. Simply put, during this period Chile was more concerned with political, social and economic development than it was for environmental issues.

As discussed in Chapter Two, this approach does not work. These issues are interlinked and virtually inseparable. As outlined in section 17.4 of Agenda 21,

"Despite national, subregional, regional and global efforts, current approaches to the management of marine and coastal resources have not always proved capable of achieving sustainable development, and coastal resources and the coastal environment are being rapidly degraded and eroded in many parts of the world".⁷⁶

⁷⁶ Agenda 21. (1993). Chapter 17. S. 17.4. p.3.

My question is "why"? This question is relative to my argument, and can be partially answered in this chapter. The social, political, and economic realities that challenge the linkage between development and the environment in Chile, are central to answering this question. Chile did not achieve the full potential of socio-economic development, while simultaneously protecting the environment, because it did not have a *current approach to the management of marine and coastal resources*. The lack of responsible and realistic environmental policy development at the national, regional, and international level could be the missing piece to this complex puzzle of linking socio-economic development with responsible environmental management.

After the Spanish conquest, Latin America emerged with a society divided along racial and economic lines. It was governed by political and economic elites that identified themselves more with western culture than the indigenous cultures of the land. As a consequence, the Latin American States, comprised of members of the elites and technical bureaucrats, envisioned development as the need to modernise. Development, therefore was seen as the need to abandon traditional values and culture, in order to adopt the western model. As socialist Daniel Lerner asserted,

"social change everywhere was a function of the number of individuals who adopted the attitude and behaviour patterns associated with modernity".⁷

Considering this traditional point of view, Chile is at risk of economic development at the cost of environmental degradation, and neglect of social development.

B. The Social and Economic Issues

Chile's population is primarily of European descent, consisting of an almost homogeneous group sharing a common system of values that allows for cohesive political organisation. Therefore, Chile's lack of racial differentiation had contributed in the past to reduce the traditional Latin American indifference to the hardships of low income groups. Chile, historically, had been a real live laboratory for some of the most extreme politico economic experiments in the region. The pendulum swung from a democratic, nationalist, socialist - bordering on communist - elected government, to an extreme right autocratic dictatorship, promoting, the internal security doctrine, *laissez-faire*, free markets and an internationally open economy. Each one of these stages changed the philosophy of the State to benefit those groups most useful to its goals.

⁷ Lerner, D. (1965). *The Passing of Traditional Society: Modernizing in the Middle East*. New York Free Press. p. 83.

"They sought to encourage industrial growth by establishing new lines of credit, protectionism, direct and indirect subsidies, price controls, and state investments in key areas such as steel and energy, which required large capital outlays. As a result, by the late 1960s Chile's industrial sector produced a broad range of consumer goods, if not always at internationally competitive levels of efficiency."⁷⁸

The reduced socio-economic benefits derived from the "export lead model" during the period 1920-1930, forced Chile to search for a new strategy of development. After analyzing the inequity of the terms of trade in the international markets of primary commodities, structuralist economists, headed by Raul Prebisch, reached the conclusion that economic growth could only be obtained by:

- a) producing imported manufacturing goods domestically,
- b) protecting infant industries from unfair competition,
- c) raising the standard of living and quality of life while creating a strong domestic market.

To reduce the dependency on imported manufactured consumption, the private sector was given the necessary incentives. Nevertheless, the industries established, concentrated their effort to the production of expensive commodities requiring technology transfer⁷⁹, machinery,

⁷⁸ Valenzuela, J., and Valenzuela, A. (1991). Latin America. Its Problems and its Promise in "Chile: Development, Breakdown, and Recovery of Democracy". Westview Press. Oxford.

⁷⁹ Seen only as knowledge.

equipment and foreign inputs for its production. Since export production did not receive equal encouragement, earnings in foreign currency were insufficient to cover the needs resulting from this strategy and balance of payment deficits became a permanent condition.

The real beneficiary of this economic alternative was the industrial upper class that did not only receive the incentives, but also received the protection against international market competition by introducing high custom duties. In order to increase the domestic market for these industries, the State aimed to improve the standard of living of the middle class, through education, employment and higher wages. But since most of the new industries limited themselves to the production of sumptuous consumption products, there was little incentive to benefit other classes. The exception to this was the small concessions granted to active labour unions.

"In short, the change and modernization that have occurred in the last century have had little positive effect, particularly on the quality of life of the majority".⁶⁶

The growth of the middle class was due mainly to the increase in university education and government employment, which became the most popular means for social class mobility.

⁶⁶ *Feinberg, R. (1972). The Triumph of Allende: Chile's Legal Revolution. Mentor Book. New American Library. New York. p. 50.*

"Furthermore, this educated middle class of professionals and bureaucrats grew much more rapidly than the economy, in what might be considered an artificial expansion"⁶⁷.

However, this tendency produced a high participation of non productive tertiary activities within the economy ⁶⁸ (private professional and government services,) accounting for 60% of the total domestic production, while productive activities such as agriculture, mining and industry reached only 10%, 6%, and 19% respectively. Consequently, in the period 1950-1964, Gross Domestic Product (GDP) was practically static, growing only at 3.6% and 1.6% per capita⁶⁹. Agricultural activity declined from 13% to 10% and lagged behind population growth, while mining became the sole source of export production, representing 90% of total exports, out of which copper contributed 80%. Mining represented only 4% to 6% of GDP, and employed 4% of the total labour force. Consequently, during this period Chile had:

- a) a lack of export diversification, leaving it dependent on the capriciousness of the severe fluctuations in the international copper markets.
- b) rampant inflation due to a severe lack of domestic production and

⁶⁷ Martinez, L. (1992). Del Reformismo al Ajuste Estructural. Ediciones Oceano. Mexico.

⁶⁸ Ibid.

⁶⁹ Martinez, L. (1987). La Aplicacion del Modelo Monetarista en Chile, Argentina, Uruguay. Ediciones Oceano. Mexico.

c) government price controls to reduce inflation, which in turn tended to suppress market incentives for new productive activity.

However, Chilean society had reached a very high level of political social development, demonstrated by the diversity of political ideologies battling to find solutions to the socio-economic problems of the country. In fact, Chile was the first country where a party promoting extreme radical political and economic changes took power through a peaceful domestic democratic process. In his first State of the Nation Message before congress in 1971, President Allende said

"I am sure we have the energy and the capacity necessary to pursue our ideal, to construct the first socialist society built according to a free, pluralistic, democratic model".⁷⁰

C. The Political Past

In 1964, Eduardo Frei had taken the reins of government, proposing to stimulate economic growth to accomplish his political parties goals of social justice. During this and the subsequent period, major attention was paid to the reduction of the country's "Social Debt," and the restructuring of the real socio-economic "bottlenecks" hindering sustainable development. Socio-economic groups who had benefited less by previous governmental policies became the object of social development. The government agenda incorporated not only policies of income distribution and

⁷⁰ Feinberg. Opp.Cit p.250.

expansion of social services, but also measures to reduce the inequities of land distribution and the unfair exploitation of natural resources by transnational companies.

Frei's government had four main items on its agenda⁷¹:

1. Break out of stagnation through higher growth rates.
2. Defeat inflation
3. Improve distribution of income and wealth
4. Secure the Nation's economic sovereignty

Economic growth was achieved in the first years of his mandate reaching rates of 5% and 7% in 1965 and 1966, respectively.

"In fact, during the Frei administration the general economic situation improved and state income increased, thereby generating greater economic capacity to increase the income of the newly mobilized popular sectors as well as large government capability to finance new programs".⁷²

However, a drought came to hamper his efforts, not only in agriculture but also industry, since electric production had to be rationed. Adding to the drought, agricultural activity was negatively influenced by the anticipation of an agrarian reform, although this was not instituted until 1969, while industry was caught in a vice of rising costs and

⁷¹ *Business International Corporation. (1975). Chile after Allende: Prospects for Business in a Changing Market.*

⁷² *Valenzuela, J., and Valenzuela, A. (1991). Latin America. Its Problems and its Promise in "Chile: Development, Breakdown, and Recovery of Democracy". p.489*

diminishing profits, because of wage legislation and inflation.

Inflation, on the other hand, was difficult to control because of the other two priorities of the government, economic growth and income distribution. Consequently, it was difficult to control prices, especially where the unions had become quite powerful and empowered. Income distribution goals could be considered quite effective since real salaries increased by 63% by the end of his administration. However, the rural sector did not receive any of the benefits of the middle class and the urban labour movement.

"According to the structuralist school of thought, wages are in fact indexed to profit margins through consumer prices, whereby prices are essentially determined ex-ante, i.e., before they are established by the market, by adding a margin to the cost of production of the company that reflects the latter's strategy"⁷³.

Reformers remained frustrated during the Frei regime. Reform was not fast enough, had diluted content and was being incorporated into existing structures. The agrarian reform was the most radical political reform under Frei's government and it served to demonstrate the problems he as well as other leaders had under the existing social, economic, and political structures.⁷⁴

⁷³ Salama, P., and Valier, J. (1993). The Difficult Road of Raising and Falling Inflation in Latin America. "Canadian Journal of Development Studies". Vol. 14, no 2.

⁷⁴ Feinberg, R. (1972).

"The Frei regime attempted reform in taxation, copper, education, housing and community development, and agriculture. Each to varying degrees, met with some success, but all ran into serious difficulties, and fell well short of the goals their planners had originally set."⁷⁵

Frei was quite successful in the "Chileanization" of the mining industry, arriving at the transfer of ownership very amicably and in good terms for the government. The purchase of Anaconda's two mines, Chuquicamata and El Salvador at \$197 million, was paid in dollar bonds maturing over 12 years.⁷⁶ These bonds were in part paid by the dividends received from the company and \$85.2 million⁷⁷ in additional revenues obtained after negotiating a higher share for the government by the increase of international copper prices.

Frei was very capable of controlling public finances and leaving both the country and the State in a sound financial position. Frei had two basic problems according to Anibal Pinto,

"he did not succeed in breaking the traditional model of economic behaviour and he had to deal with the unquestionable political erosion of the regime and of the governing party"⁷⁸.

⁷⁵ *Ibid.* p. 58

⁷⁶ Business International Corporation. (1975). Chile after Allende: Prospects for Business in a Changing Market.

⁷⁷ Ibid.

⁷⁸ Pinto, A. (1970). Desarrollo Economico y Relaciones Sociales" en Chile Hoy. Editorial Universitaria, Santiago". p. 49.

It is important to mention that he was helped by propitious international conditions. At this time the United States faced severe domestic problems with the civil rights movement and opposition to the Viet Nam War, which allowed them to perceive Frei's intentions for what they really were and not see a communist plot behind every one of his moves.

However, towards the end of the electoral period, factions within Frei's Christian Democratic Party began to split⁷⁹. The left flank on what they perceived as a lack of advance on social and economic reforms and the conservative right that feared more structural changes. In the meantime the coalition of the left with Salvador Allende and the rightist camp supporting Jorge Alessandri, benefited from this. This was demonstrated in the results of the 1969 elections, Allende winning with 36.2%, a narrow margin over Alessandri (34.9%) and the government backed candidate, Ramiro Tomic, obtaining only 27.8% of the vote.⁸⁰

Allende's administration did not begin with radical changes⁸¹, in fact it followed the basic guidelines instituted by Frei's administration. However, his fame as a Marxist

⁷⁹ Kaufman, R.R. (1976). Transitions to Stable Authoritarian-Corporate Regimes: The Chilean Case Sage Publications. Beverly Hills, Ca.

⁸⁰ *Ibid.*

⁸¹ Business International Corporation. (1975). Chile after Allende: Prospects for Business in a Changing Market.

politician had preceded his actions, changing international and domestic appreciation of Chile's political scene and forcing him to take more radical actions which endangered his social agenda, his government and his life. When he took over the government, his first actions were directed to promote economic growth, signing production contracts with key industries and guaranteeing a given volume of sales.

"Allende's job was to convince the middle classes to support or at least not obstinately oppose the construction of this new economic model. Should the economy balk, Allende would be faced with the dilemma of either reducing the middle classes' living standard or else failing to meet even the minimal aspirations of his most loyal supporters, the workers⁸²".

Because of the wide margin of idle installed industrial capacity, the economy grew at an impressive 8.5%, compared to the previous 3.7% average annual growth.⁸³

Allende's government agenda was based on strong State intervention. He increased public employment and salaries, to secure the high quality human resources for the State programs; however, this also multiplied the cost of expenditures on wages and salaries by 27%⁸⁴. Due to the negative outlook, foreign creditors, including the Bretton

⁸² *Feinberg. pp. 232-233.*

⁸³ *Business International Corporation. (1975). op cit.*

⁸⁴ *Ibid.*

Woods Organisations⁸⁵ that refused to renegotiate foreign debt, his government was forced to finance the deficit solely with domestic credit which grew at an alarming 500%⁸⁶ However, the short term effect was positive for the economy, resulting in an impressive reduction in unemployment and in economic indicators (4.5%), going from 8.3% to 3.8% in one year.⁸⁷

The continuation of the "Chileanization" project, however, was a point of contention for the industrial domestic elites and foreign transnational companies (TNCs). Allende did not follow the same diplomatic tactics as did Frei. Allende believed he was recuperating that which was rightfully Chilean property. Therefore, it was not necessary to compensate TNCs that had benefited so prosperously from the exploitation of Chilean natural resources. This point of view resulted in the retaliation by foreign companies, some of them opting for embargoes to Chilean copper production. They promoted foreign financial institutions to curtail the financing to Chile, and foreclosed the possibility of renegotiating Chile's foreign debt.

⁸⁵ Chilcote, R.H. "Latin American Contribution in Perspective" Theories of Development and Underdevelopment. p. 198.

⁸⁶ Ibid. p. 13.

⁸⁷ Ibid.

Nationalisation was expanded to include the banking system and the foreign trade sector. The banking system was bought outright, while the trading sector was reduced by the creation of competing State agencies.

As Allende lost the backing of Congress, due to the Christian Democratic and National Party pact, and as the economy worsened, the media⁸⁸, owned by strong industrial domestic elites, convinced the people that,

"the defence of wealth, privilege, and economic power were one and the same as the defence of their household property and the democratic process⁸⁹".

At the same time, the industrialists retaliated with work stoppages and the closure of industries. Although in the electoral plan, nationalisation of industries was not considered and Allende was forced by radical labour unions to intervene and take over manufacturing plants of those that refused to cooperate with the State. Lacking the support of the Legislature he opted to use old legislation. Sensing the end of his government, Allende also increased the pace of his reforms, proceeding with educational reform and the expropriation of land holdings, even less than the eighty hectare limit stipulated by existing Agrarian reform. These actions provided fuel to the media, who continued their

⁸⁸ O'Brien, P. and Roddick, J. (1983). Chile: The Pinochet Decade: The Rise and Fall of the Chicago Boys. Latin American Bureau. London, U.K.

⁸⁹ Ibid. p. 33.

defamation labelling him as a communist, destroyer of democracy and an abuser of human rights.

"On June 29, 1973, a military garrison revolted. Though the uprising was quickly put down, President Allende and his advisors realized that it was only a matter of time before the golpista (pro-coup) faction of the armed forces consolidated its strength⁹⁰".

Although the radical government is generally criticised for the lack of financial responsibility, it is believed that the real reason for the military revolt was Allende's attempt to change the status quo. Some would argue that the middle class feared the possibility of losing the slight privileges it had gained up to that point, and saw a better future in an alliance with the protectors of the Western Capital model. Others would say, Allende's plan was bound to fail anyway, since the international world order would not allow such a radical program to succeed. For certain, one of the basic problems was that Allende's reforms followed a top down approach, with only the backing of the most radical members of society, (who practically came to determine government policies) without participation at the community level.

Chile, was totally immersed in social, economic and political issues. There appeared to be no regard or genuine concern for the environment.

⁹⁰ Valenzuela, J. and Valenzuela, A. p. 494.

D. The Economic Growth Period

The affluent middle class reaped the benefits of the so called "Chilean miracle" during the economic recovery of the Pinochet regime. In the 1980 Economic Profile the Chilean government boasted its success by declaring:

"Five years ago Chile boldly embarked on a course to revitalize its economy, replacing protectionism with free market policies...the average GDP rate over the past five years has been 7.3%⁹¹".

The economy during this period did indeed become diversified and was equipped and capable to compete internationally.

The 1973 coup d'état was characterised by the extreme violence with which the military tried to destroy not only the State, by supposedly assassinating Allende (some believe suicide), but also labour, agrarian and community organisations born during his government. One of the explanations is the subscription of the Armed Forces to the Internal Security Doctrine (ISD), by which national interests are subordinated to ideological concerns for the survival of the capitalistic system. According to ISD, the control of the internal enemy (any one opposing the policies of the regime is identified as an "internal enemy") is necessary to protect the country from the *horrendous* threat of communism.

Under this framework, social concerns and empowerment of vulnerable groups is seen as an attempt against the capitalist system.

⁹¹ Loveman, B. (1988). Chile. The legacy of Hispanic Capitalism. p. 328.

"The authorities put in place a radical program of privatizing state services in social security and health, which meant dismantling long-standing publicly funded institutions⁹²".

Consequently, these programs have to be erased from the State agenda to be replaced by a free market ideology. Therefore barriers are eliminated and free rein is given to foreign import.

Once the military took over, the so called "Chicago Boys", economists trained under Milton Friedman's doctrine of the "miracle of the market", took over the restructuring of the economic system, and a blind eye was turned towards abuse of human rights and anti-democratic actions. Pinochet called a referendum in the face of a UN charge of human rights violations offering the following resolution:

"In the face of the international aggression unleashed against the government of the fatherland, I support General Pinochet in his defence of the dignity of Chile, and I reaffirm the legitimate right of the republic to conduct the process of institutionalization in a manner benefiting its sovereignty⁹³".

The government claimed 75% of the electorate support. It was claimed that Chile had gone back to the fold of the capitalist system, allowing big businesses to exploit the Nation and its people without any consideration for social development.

⁹² Valenzuela, J. and Valenzuela, A. p. 489.

⁹³ Loveman, B. Opp.Cit. p.325.

The result of this strategy was the bankruptcy of 433 companies in 1981 and 808 companies in 1982.⁹⁴ Unemployment went from 6.1% in 1970 to 13.9% in 1978, and the share of wages (compared to other factors of production) in national income fell from 52.3% in 1970 to 41.2% in 1978⁹⁵. People lost 50% of their purchasing power during Pinochet's regime, and an additional 56.7% was lost between 1983-87, during the so called *Growth with Equity* period and the return to democracy. According to Loveman,

*"only slowly and with painful moderation did the majority of Chilean social and political groups begin to challenge even the most extreme measures of the military government"*⁹⁶.

Since the overthrow of the Allende government, Chile has gone through periods of economic growth and decline. There was a period of economic recovery between 1974-1976, but the oil shock, falling international copper prices and an increase of consumer imports badly affected the balance of trade. However, at this time international finance was easily available in the global markets. In 1982 the dramatic fall of copper prices and termination of foreign lending, due to the Latin American debt crisis, placed Chilean banks and corporations in difficult financial situations.

⁹⁴ Quijano, J. M. (1983). "Balance de un modelo". Comercio Exterior Magazine, Mexico.

⁹⁵ Bastias, A. C. (1980). Comercio Exterior, Mexico. Sept. p. 977.

⁹⁶ Loveman, B. Opp.Cit. p.315.

Chile began dealing with the International Monetary Fund, renegotiating national debt, with the condition that the State would have to absorb the losses of the private sector. Therefore, whether guaranteed or not by the government, private debts became the possession of the State. This placed Pinochet's government at an all time low in popularity and by 1987, a plebescite rejected Pinochet's rule with a 54.7% of the total votes⁹⁷. Pinochet's focus was more on political and economic issues. There was less attention on social programs and no attention on the environment. How long could Chile sustain economic development, and exploitation of its resources without consideration for the environment?

Patricio Alwyin, a Christian Democrat candidate of a coalition of 13 parties, was elected in 1990.

"With the inauguration of Patricio Aylwin on March 11, 1990, in highly emotional ceremonies attended by delegates from sixty seven countries including sixteen heads of state, Chile began the recovery of its more than centennial democratic tradition⁹⁸".

The results of the election gave a clear mandate to the government. Radical policies were not acceptable to the Chileans any longer, whereas neither the right nor the left parties won any seats in the congress or senate.⁹⁹ The

⁹⁷ *Ibid.*

⁹⁸ Valenzuela, J, and Valenzuela, A. p. 472.

⁹⁹ *The Economist Intelligence Unit. (1994-95). Chile: Country Profile. p. 7.*

country was in the political transition to full bourgoise democracy.

"This transition was very peaceful and moderate, where the process of democratization is irreversible, and the differences among the parties from left to right are narrowing, putting the country in an excellent position for attaining real development¹⁰⁰".

But the control of the country's affairs was not transferred to the people completely. Augusto Pinochet retained his position as commander in chief of the armed forces and maintained the right of four branches of the army to each elect a member to the senate.

Aylwin's government did not make any great changes to the previous government agenda, except spending in social programs had an impressive increase. However, since Pinochet's spending was claimed to be so low, any increase would have been impressive. His policy has been one of targeting low income groups, and this approach has been widely criticised by the radicals, since it has been claimed to address people as objects of charity, rather than securing the provision of basic needs. Environmental awareness was also becoming a concern, as was the case throughout most of the world, but there was no hard and fast policy agenda or action plan.

Aylwin's government was succeeded by the election of a centre-left coalition president. The newly elected President, Eduardo Frei (1993), received 58% of the popular vote. The mandate of his government is alleviation of absolute poverty,

¹⁰⁰ Chocair, J. (1991). p.1

through economic growth and the increase of social expenditures on health and education. During the previous governments reign, poverty had (reportedly) been reduced from five million to four million people¹⁰¹. Clearly, Frei has a tremendous task to fulfil in reducing poverty further, especially in light of the difficulties faced with socio-economic development and environmental responsibility. Poverty is discussed as the pre-eminent problem in Agenda 21, and as stated in Green Paths to the Future,

"The alleviation of poverty must be at the top of any genuine agenda on development and environment¹⁰²".

However, in Chile and throughout Latin America environmental awareness is on the rise. Even before being elected Frei was quoted as saying;

"The fact is that no one knows how much it will cost to clean up the environment. What we are faced with is a difficult decision between cleaning the environment and not halting our industrial progress. What bothers us is when industrialized countries try to impose their rules on us".¹⁰³

The environment in Chile will be addressed by Frei but to what degree and what are the implications for socio-economic development and other issues on his government's agenda? His plan is to involve the private sector in infrastructure

¹⁰¹ Santa Maria, G. (1994). *Personal Communication. Chile.*

¹⁰² Agenda 21. (1993). Green Paths to the Future. p.4.

¹⁰³ Nash, N. (1992). Chile faces dilemma of industry vs. environment. The New York Times reprinted in The Globe and Mail, November 14, 1992.

development through the build-operate-and-transfer (BOT) system,¹⁰⁴ which has been deemed by many as very successful, and environmentally responsible. His Presidency will indeed be interesting to observe throughout the 90's and perhaps beyond. Will his government be as preoccupied with political, social and economic issues, so as not to develop and implement policies towards the preservation and protection of the environment?

Chile's non-traditional exports have diversified its dependency on mining, especially copper. However, this comparative advantage has relied on the production of agricultural and fishing products, reducing the country to a low scale in the new international division of labour. The beneficiaries of the Chilean economic growth, have been the domestic and foreign elites; whose private foreign debts were paid for by the government¹⁰⁵ and in the process managed to purchase privatized State owned and private bankrupt industries at very low prices. Last, but not least, the foreign providers of manufacturing goods saw all barriers and protection to domestic competitors lowered. Foreign investors, such as large shipping companies were not sharing the brunt of environmental degradation, nor were they

¹⁰⁴ *The Economist Intelligence Unit. (1994-95). Chile: Country Profile.*

¹⁰⁵ *Ibid.* p. 72-75

concerned with the over-exploitation of Chile's natural resources.

E. Legal and Institutional Aspects of Environmental Policies and Conventions

Although environmental issues have not been a priority regarding environmental policies during the era discussed in this chapter, several Chilean organizations have been interested in and involved with environmental problems. Some of these are, CODEFF (National Committee for the protection of Flora and Fauna) founded 23 years ago, ACHIDAM a Chilean organization formed more than 15 years ago promoting the right to protect the environment, and CIPMA founded in 1980 as a centre of research and planning of the environment.

The lack of a National Environmental Policy (NEP) until earlier this year caused many difficulties for Chile with integrating one unique set of laws, with the responsible authorities clearly established. The newly legislated environmental policy (approximately April, 1994) is still a framework, and Chile has a long way to go in regards to prioritizing and implementing these laws and policies. The financial commitments in complying with this legislation places tremendous strain on government, and the present government admits that it will take several years to meet the obligations.

The positive view from many legislators and government officials is that starting from zero is in some ways an advantage as it enables Chile to develop an overall conception instead of having to deal with a number of disconnected and disorganized legal provisions.

The government basis for future environmental policies has created a national committee of the environment that is responsible for the government actions in environmental issues. This Ministry is known as CONAMA. Regarding pollution of the marine sector, the Director General of the Navy, Merchant Marine and Coast Guard known as the DIRECTEMAR has full responsibility and authority.

Some of the legislation that Chile has signed in regards to marine pollution during the periods discussed in this Chapter (and up to the present time) are:

International Agreements

- OILPOL/54. International agreement for the prevention of hydrocarbon contamination of seawater. 1954.
- Intervention 1969. International agreement for intervention in the case of oil spill accidents. 1969.
- International agreement on civil responsibility for damages caused by hydrocarbons in water contamination. 1969

- International agreement for prevention of marine contamination by waste discharge and other materials. Law Decree/71. 1972.
- LDC/72. The London Dumping convention, 1972. Ratified in 1989.
- SOLAS/74. International agreement on human safety in the ocean. 1974. Later amendments under Law Decree 3175, 1980.
- CLC/75. International Agreement on Civil responsibility of damages caused by contamination of seawater by hydrocarbons. 1975
- CPPS/81. Permanent Commission of the South East Pacific. Agreement on the regional cooperation to combat contamination of the South East Pacific by hydrocarbons and other toxic substances. 1981.
- Supreme Decree 656. Complementary protocol to the agreement on the regional cooperation to combat contamination of the South East Pacific by hydrocarbons and other toxic substances. 1983.
- Protocol for the protection of the South East Pacific against contaminants originated from terrestrial sources. 1986.
- Agreement for the protection of the marine environment and the coastal zone of the South East Pacific. 1986.

- OPRC/90. This international agreement on oil pollution preparedness, response and cooperation is presently under review.
- MARPOL 73/78. International agreement to prevent contamination from shipping operations. Several annexes signed in Nov., 1994.

National Legislation.

- Navigation Law D.L. no. 2.222, 1979. (This law is discussed in greater detail in Chapter 4).
- National Environmental Law. 1994. This law is presently a framework and is presently being reviewed, April, 1994.

F. CONCLUSION

This preoccupation with the different economic and social systems had so deeply involved the political agenda, that subjects such as the preservation of the environment and pollution control had no room within the State's agenda. Considering such an inflexible agenda, it was not possible to address environmental issues while at the same time strive for socio-economic development. However, since international regulations and protection of ocean resources have obtained an important place in the Global scene, Chile is faced with negotiating, agreeing to and ratifying International Ocean and Environmental Policies. In any case, domestic and political backing is extremely frail, and the Chilean state still appears to concentrate on economic progress.

CHAPTER FOUR

POLICY DEVELOPMENTS IN THE MARINE ENVIRONMENT

A. Introduction

This chapter discusses developments in marine environmental policy over the past 3 decades. This is in order to provide an understanding of the history and regulatory bodies involved with drafting and implementing international legislation aimed at protecting the marine environment. Policy development is important to my argument as one has to understand the role of the state in creating the appropriate conditions for a regulatory framework. Thus, the environment and development are affected by policy issues initiated by government.

This discussion further develops my argument by stating the need for a revolution in marine law in order to fully dispose of "freedom of the seas". This chapter is important to this thesis as it details several policies, conventions and protocols that Chile (as well as other countries) signed, or are in the process of ratifying. It supports my argument by presenting evidence that will argue that international acceptance of recommendations for the prevention and control of marine pollution is the ultimate goal of marine policy development, and if achieved will subsequently lead to, and maintain, harmony between maritime transport and the marine environment.

The last 3 decades represent a period of widespread global change - political, social, economical, technological and ecological. During this period, some of the greatest marine ecological disasters occurred (the Metula off Chile, 1974, the Exxon Valdez off Alaska, 1989, the Braer off the Shetland Islands, 1993, etc.), as a consequence of the international transport of petroleum products. At the same time there has been a groundswell in the environmental movement and an increased demand for accountability on a local, regional and international scale. One important result of this period of change has been the broadening of many of the national governments' views from a regional to a more global perspective. Nowhere has this shift had a greater impact than in the administration and control of the oceans on a global scale.

B. LAW OF THE SEA (LOS)

"Freedom of the Seas" was the basic law used in regards to marine affairs before laws and international regulations concerning the oceans were established. Vessels sailed the world's oceans free to discharge wastes with impunity, and coastal communities suffered ecological, economic and social damage as a result of several oil spills. The United Nations Convention on the Law of the Sea (UNCLOS), established on the 10th December 1982, has provided an international legal framework for dealing with both seabed (article 208, 209) and

vessel sources (article 211)¹⁰⁶ of marine oil pollution. Under international law, inclusive of the UNCLOS, individual state's territorial rights are defined, as well as their responsibilities with regard to pollution or damage to the environment. These laws represent important developments concerning protection of the marine environment, and are equally critical to sustainable socio-economic development.

The Convention on the Law of the Sea calls for four kinds of international cooperation: Bilateral and regional collaboration, protecting global commons or areas beyond national boundaries, technical assistance in terms of scientific knowledge and human resources, and national commitments to protection of the marine environment. Under the Convention, disputes over the sea and marine resources are settled through a 3 step process:

1. States are allowed to go to any round of negotiations that they desire, including arbitration and mediation.
2. A conciliation process that requires a framework for committee formation.
3. A binding dispute resolution mechanism that commits states to binding agreements in the Convention, unless a country specified a preference when signing the Convention.

¹⁰⁶ *The United Nations Law of the Sea Convention, (1982). U.N. Doc./ A/CONF. 62/122 is reprinted in 21 I.L.M. 1262 .*

The principles set out in the UNCLOS are reinforced by the declarations of the 1992 United Nations Conference on the Environment and Development held in Rio De Janiero, Brazil. Chapter 17 of Agenda 21 builds on the contents of UNCLOS and

*"sets forth rights and obligations of states and provides the international basis upon which to pursue the protection and sustainable development of the marine and coastal area management and development, at the national, sub-regional, regional and global levels"*¹⁰⁷.

The Law of the Sea represented the culmination of years of meetings to establish an international legal framework. Some of these (not all) are:

1982--the United Nations Convention on the Law of the Sea (UNCLOS).

1978--the International Convention for the Prevention of Pollution from Ships, MARPOL-1973-78

1972--the International Convention on the establishment of an International Fund for Compensation for Oil Pollution damage.

1972--The London Dumping Convention-- in force as the London Convention 1975

1969--the International Convention on Civil Liability for Oil Pollution Damage.

1954-- the International Convention for the Prevention of Pollution of the Sea by Oil (amended 1969)

¹⁰⁷ The text of this chapter is reproduced in Van der Zwaag, D., McConnel, M. and Hatch, J. (1992). Readings in International Environmental Law. Halifax, Dalhousie Law School.

The most recent international convention on oil pollution is The Convention on Oil Pollution Preparedness, Response and Co-operation 1990 (OPRC 90)¹⁰⁸ which was largely initiated by the Exxon Valdez oil spill in Alaska, 1989. This convention aims to provide a global framework for international, regional and national government and industry in contingency planning on threats to the marine environment. With the establishment of this legal framework, signature nations had for the first time a firm set of guidelines to control and reduce the damage to coastal environments, resulting from oil pollution and other contamination due to international shipping.

The reduction of oil pollution from marine shipping is recognised in almost every coastal nation as a greatly desired goal, but conforming to the provisions of the Law of the Sea, and subsequent Conventions, may come at a cost which is highly prohibitive for many developing countries.

C. The London Dumping Convention (LDC)

"Dumping" into the oceans for the most part means the discharging of environmental waste. In order to encourage and sustain long term socio-economic development, degradation to the marine environment has been somewhat controlled by those measures encompassed in the LDC. Marine environmental protection is covered by a multilateral convention, the 1972

¹⁰⁸ IMO. (1991). OPRC Convention: International Convention on Oil Pollution Preparedness, Response and Co-operation. 1990. IMO. London.

London Dumping Convention, since changed to the London Convention (1975). It came into force in 1990, when it was signed by 64 states. The Convention covers dumping by aircraft, ships and other forms of human constructed structures, including platforms (The particulars of Chile signing the London Dumping Convention is discussed in section F-4 of this chapter).

The basic approach in this Convention is dumping by permit issued by the jurisdictional states. The criteria used in categorization of wastes in respective annexes and issuance of permits are toxicity, persistence, potential effects on ocean uses and better ways to disposal, particularly land based options. The convention groups pollutants into three categories, that are listed in respective annexes. The various materials listed in each category are as follows:

Annex 1 This annex identifies pollutants that are blacklisted. Material in this annex are totally prohibited and no permits can be granted by the states. These materials include organohalogens, mercury compounds, cadmium, persistent plastics and other synthetic products, crude oil and petroleum products, biochemical war materials and radioactive materials.

Annex 2 Referred to as the Grey List. It covers pollutants that can be dumped by special permits if special care is taken during the dumping process. Materials included in this annex include wastes

containing significant compounds of zinc, copper and fluorides not listed in annex 1, scrap metals and other bulky materials which may obstruct fishing and navigation vessels, and low level radioactive materials. Annex 3 All other materials fall under this annex and can be dumped with permits.

The Convention has six major weaknesses:¹⁰⁹

1) In the formative years it was not based on the precautionary pollution prevention principle policy, but rather on the absorptive capacity of the sea. Since 1991, however, there has been a progressive shift to the precautionary approach.

2) The material listed in the annexes are limited, seven in the black list and six in the grey list, as contrasted with the estimated seven to eight hundred substances in industrial use today. However, in 1992, the contracting parties agreed to consider adopting a reverse listing approach in which all materials would be prohibited unless otherwise allowed in an annex.

(3) Absolute 'nos" do not exist in annex 1 and even can be dumped; for example, under emergency weather conditions which threaten the safety of the ship or human health risk.

¹⁰⁹Van der Swaag, D., McConnel, M. and Hatch. (1992). Readings in International Law. Halifax, Dalhousie Law School.

(4) The Convention does not provide a liability and compensation regime under which states would be held responsible for ocean dumping.

(5) Under the Convention states can be granted immunity. Section 7 of article 7 excludes government, military and non commercial vessels from the restraints of the Convention.

(6) There are only a limited number of states which are parties to the Convention. Developing countries are especially rare. (Chile has signed.)

These limitations are mitigated by the fact that contracting parties meet once every two years at the International Maritime Organisation (IMO) in London. During these meetings, Members can develop further or additional legal regimes, including a moratorium on low level radioactive materials.

D. The Impacts of Marine Policy on Developing Countries

Early attempts (1958, 1960) to improve international regulations and to change the prevailing 'Freedom of the Seas' attitude failed to include many developing states and as a consequence, met with limited success. These nations were increasingly critical of traditional law, which was based upon freedom of navigation and limited coastal state

sovereignty to a narrow area adjacent to the coast¹¹⁰. In any case, the developing countries had a comprehensive understanding of the importance of their marine resources and the marine environment. However, they were at odds as to how they could protect these invaluable resources while at the same time absorb the associated costs, and encourage sustainable development. Therefore, a third UNCLOS conference was held in 1973 to address their concerns, with one of its goals being the establishment of an International Seabed, as well as measures to ratify Law of the Sea issues. Many developing countries, seeing increased economic benefits from the exploitation of minerals and the international seabed urged the establishment of the largest boundaries possible. Chile, along with other Latin American coastal states, eventually convinced many of the African and Asian nations that the extension of national jurisdiction to 200 miles would provide an increase in fishery and mineral resources¹¹¹. This resulted in two main objectives for the developing nations at the UNCLOS conferences:

"the establishment of an International Seabed Authority to control and regulate the exploitation of the resources of the deep seabed" and 'the recognition of national control over a 200-mile exclusive economic zone (EEZ), within which coastal states would have jurisdiction over fisheries, mineral

¹¹⁰ North-South Institute. (1981). Briefing Canada, The Third World And The Law Of The Sea.

¹¹¹ Ibid.

resources, the preservation of the marine environment and the conduct of marine scientific research".¹¹²

This was critical to sustainable socio-economic development and the preservation and protection of the marine environment.

The Law of the Sea sets 10 zones of ocean protection concerned with the management of the seas.

(a) *Internal waters*. This encompasses the waters closest to the land territory and is delineated by drawing baselines on the areas covered by the high tides. Waters enclosed by small islands off the coast are also recognised as internal waters. This is the zone where the coastal state has the greatest jurisdiction.

(b) *Territorial sea*. This zone extends to 12 nautical miles off the coastline and it is administered similar to the internal waters. Articles 21 and 22 define the rights of coastal states and grants them full jurisdiction except the right of innocent passage, as defined by article 19 in the LOS Convention. Any act of wilful and serious pollution is not considered as innocent passage.

(c) *Contiguous zone*. The LOS Convention allows coastal states to protect their customs and immigration laws.

(d) *Exclusive Economic Zone*. The EEZ extends to 200 nautical miles from the territorial baselines. The LOS Convention empowers the coastal states to exploit

¹¹² *Ibid.*

resources, including fisheries, mineral and offshore oil. Article 211 sets limits on the coastal state's powers to set international standards that should prevail in the EEZ. Article 220 sets out the procedures that coastal states should apply for dealing with foreign vessels.

e) *Continental shelf* . This area extends to about 350 nautical miles and coastal states can exploit resources within this zone.

f) *High seas*. Which are beyond the national jurisdiction of coastal states. Other states have the right to conduct business and the responsibility for any environmental catastrophe lies with the flag state.

g) *International seabed* . This region is declared as a common heritage for humankind. The Convention specifies the establishment of an international seabed commission to regulate this zone.

h) *Ice-covered waters*. Articles 234 empowers coastal states to set special laws for managing icewaters.

i) *Archipelagic waters*. In the case of archipelagic states, the LOS Convention empowers them to draw baselines connecting all the islands, and the enclosed waters are considered as internal waters. The Convention, however, makes a provision for international shipping by allowing for archipelagic sailing.

j) *International Straits*. Those passages that are used for international navigation. Coastal states are allowed

to pass pollution prevention and minimize legislation subject to international standards.

A substantive session of the Law of the Sea conference in Caracas (1974) involved several coastal-state groups. Chile was very active during this conference and was instrumental in provoking draft measures on policies to prevent marine pollution. This conference achieved some commitment from those negotiating parties involved to co-operate with monitoring and enforcing anti-pollution foreign policy. The lesser developed states, however, were concerned that they would be burdened with the costs of pollution, which they did not cause and that exorbitant costs for pollution control would hinder their development. Jeanne Sauve, the Canadian Minister of Environment, agreed and was of the opinion that it would be futile to impose these environmental costs on developing countries that could not realistically assume them.¹¹³

While some progress was made at these conferences, the outcome of the LOS negotiations was a disappointment, due largely to lack of agreement. Non-agreement was for the most part due to the fact that the LOS involves only a minor portion of major foreign policy interests of developed nations. Contrary to most developing countries, the

¹¹³ Johnson, B. and M. Zacher. (1980). Canadian Foreign Policy and the Law of the Sea. p.116. University of British Columbia Press. Vancouver, Canada.

developed nations were always in a position to be opportunistic when considering ocean resources, since they have the human and capital investments required for prolific development.

*"A treaty which allocates certain aspects of ocean wealth to underdeveloped nations would thus appear quite advantageous to such nations, because in the absence of agreement, only the developed states will be in a position to rapidly and effectively exploit the multitude of values in the marine environment."*¹¹⁴

Non-agreement however could not be blamed entirely on the developed nations, since it appeared that the evolving countries also had their own agendas, which were not entirely focused on environmental and LOS issues. As discussed in Chapter Three, Chile, for example was preoccupied with its political, social and economic agenda.

Earlier in 1994, eighty countries met during an international meeting sponsored by the Global Environmental Facility (GEF)¹¹⁵. It is interesting to note that during this meeting, Canada honoured previous commitments made during the 1992 Earth Summit in Rio de Janeiro. Canada promised a contribution of over 112 million dollars, during the next 10

¹¹⁴ Knight, H. G. (1976). On sequences of Non-agreement at the Third U.N Law of the Sea Conference. West Publishing Co. St. Paul. p.62.

¹¹⁵ as part of the GEF meeting

years, to assist developing countries deal with environmental problems, inclusive of pollution of international waters¹¹⁶.

In 1975, the UNCLOS agreed on a 200 mile Exclusive Economic Zone (EEZ). Initial reaction to the proposal by industrialized nations was hostile. This was championed by several developed coastal states¹¹⁷. Eventually, coastal states' rights, with regard to mineral resources, fisheries, marine pollution and scientific research within the EEZ were established. Vessel-source marine pollution represented an area of difficulty during these negotiations. In the beginning, Chile, as well as other developing coastal states, were attracted by the idea of increased powers to prevent or control pollution of their coasts. However, when they realized that stricter controls might impede their economic development, their enthusiasm waned. In the end, limited coastal states powers in the EEZ were recognized. Once again, it was clear that Chile was more concerned with socio-economic development than it was with protection for the environment. Again, can Chile develop socially and economically, while continuing to show disregard for the environment?

¹¹⁶ Chronicle Herald. (1994). Canada to help fight global pollution. March 19.

¹¹⁷ North-South Institute. (1981).

E. A Latin American Perspective: The Case of Chile

The concept and eventual establishment of the 200-mile EEZ has its origins in a move to protect national interests of living marine resources in the South East Pacific. In the decades following the Second World War, Chile believed control of off-shore resources were essential for its continued economic and social development and in 1952 enacted a policy (Santiago Declaration on the Maritime Zone) extending national jurisdiction over waters lying off their coastlines.¹¹⁸ Since the establishment of this zone predated the LOS conferences (even if it was not recognized by all nations), Chile had a vested interest in the adoption of the 200-mile EEZ by the nations attending the 1975 UNCLOS. The agreements arrived at during the term of these negotiations were not greeted with unanimous satisfaction by all of the Latin American nations. Chile and Columbia were signatories to the 1982 UNCLOS while Peru and Ecuador failed to ratify it¹¹⁹, although this division, with respect to the LOS, did not result in a rift in relations between these South American neighbours. Differing approaches to national and international affairs are common to the Latin American states (both in the decades leading up to

¹¹⁸ Goingles, M. and Johnston. (1976). *Marine Policy and Coastal Communities*. St. Martin's Press. New York.

¹¹⁹ Infante, M. T. (1991). *The new Law of the Sea and cooperative regimes in the Pacific: selected topics*. pp.138-142.

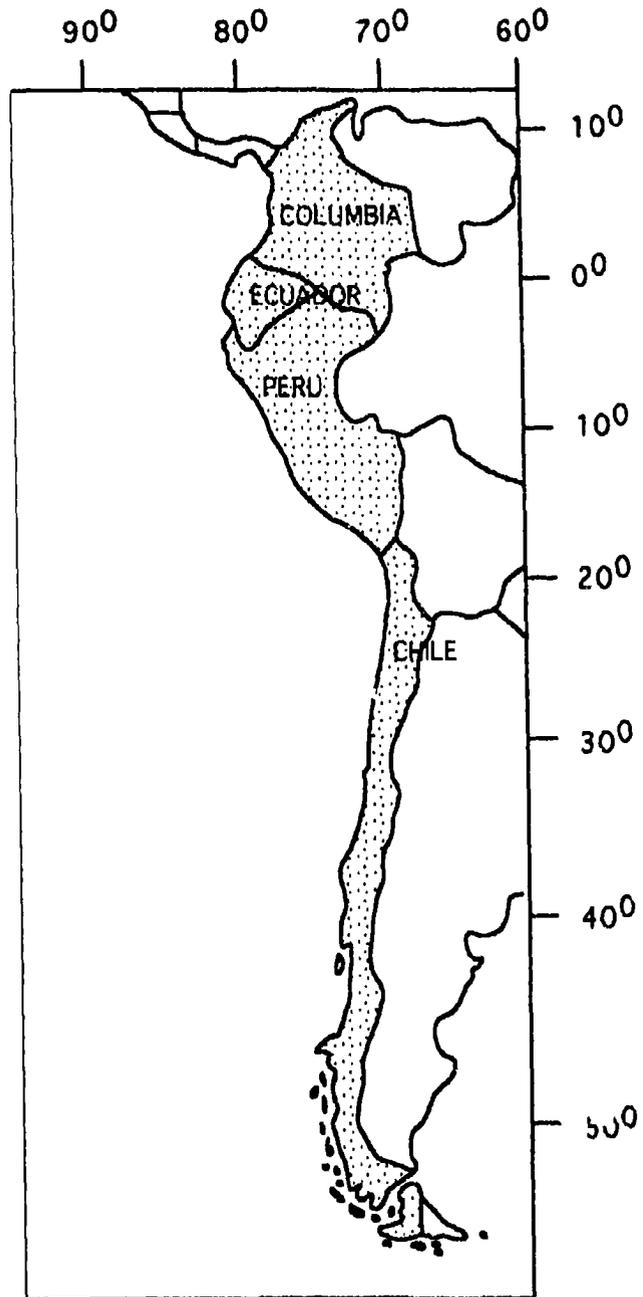
UNCLOS and after) and have not been a major impediment to regional co-operation.

Regional co-operation between the coastal states of the Southeast Pacific (Chile, Ecuador, Columbia, and Peru) has its origins with the formation of the Comision Permanante del Pacifico Sur (CPPS) in 1952 (Fig. 3)¹²⁰. The CPPS was established as a regional organization with legal competence to adopt measures regarding marine resource management¹²¹. The CPPS is composed simply of representatives from national committees of member states. Headquarters of the CPPS alternates among the member states every four years, in order to avoid partisanship. In December, 1993, The CPPS headquarters moved to Lima, Peru. The role of the CPPS has been enlarged (with the accession of Columbia in 1979) and modified over the last four decades (Fig. 3).

¹²⁰ After Ramorino. (1991).

¹²¹ Infante. (1991). Opp.Cit. pp.138-142.

Figure 3¹²² Four member nations of the CPPS



¹²²After Ramorino (1991).

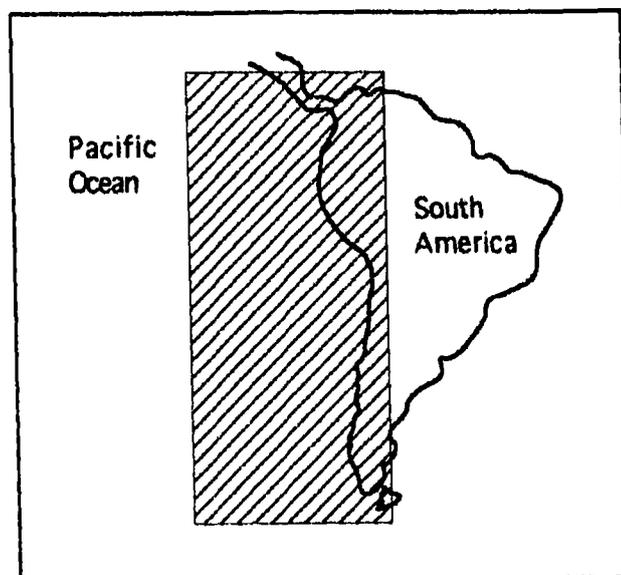
The 1972 United Nations Conference on the Human Environment established the United Nations Environment Programme (UNEP). The most significant regional initiatives in marine environmental protection to date is that of the UNEP's Regional Seas Program, which was instrumental in the implementation of action plans for thirteen regional seas areas throughout the world¹²³. These Regional Seas Programs were aimed at strengthening the ability of all the signatory countries to better manage their environmental problems. UNEP initiated the Regional Seas Programme in 1974 which endorses regional approaches to the control of marine pollution.

In Lima (1981), Chile, along with the other members of the CPPS, signed the Convention and Action Plan for the Protection of the Marine Environment and Coastal Areas of South-East Pacific.¹²⁴ This became the tenth Regional Seas programme. Figure 4 shows the marine environment region covered by the South-East Pacific Action Plan.

¹²³ United Nations Environment Program. (1991). UNEP sponsored Program for the Protection of Oceans and Coastal Areas. UNEP Regional Seas Reports and Studies. no 135. pp.1-12. Geneva.

¹²⁴ Cabrera, N. (1991). Marine Pollution Sources in the South-East Pacific: Pollution Control Alternatives. in "UNEP Regional Seas Reports and Studies No. 134, Regional cooperation on environmental protection of the marine and coastal areas of the Pacific basin". pp.1-12. Santiago, Chile.

Figure 4. South East Pacific Action Plan



The South-East Pacific Regional Environment Programme focuses specifically on marine pollution and is run by secretariats based in regional, intergovernmental organizations.¹²⁵ The purpose of this plan is

"to link assessment of the quality and causes of deterioration of the marine environment with activities for rational management and sustainable development.." as well as '...the development of regional legal agreements..'.¹²⁶

¹²⁵ Dahl, A. L. (1991). Regional and inter-regional co-operation for the protection of the marine and coastal environment of the Pacific basin. in, "UNEP Regional Seas Reports and Studies No. 134, Regional co-operation on environmental protection of the marine and coastal areas of the Pacific basin". pp. vi-vii.

¹²⁶ Ibid. pp. vi-vii.

The 1989 meeting of the National Committee for Economic Cooperation in the Pacific, held in Santiago, resulted in the focusing of the CPPS on marine resources and marine affairs, to the exclusion of political and economic areas¹²⁷. One of its functions is to extend beyond the region and develop a more active presence within the Pacific basin. Even at this time of global environmental awareness it appeared that Chile was also cognizant of the problem but still persisted to focus on economic development.

F. Chile: National and International Marine Policy Development

In the last several decades during and following the Law of the Sea conferences, Chile has made progress towards protecting their marine environment. Their national interests were raised after the Metula disaster in 1974. These national interests were driven by a need to be prepared, to respond and co-operate on a regional and international scale in the event of an oil spill. Chile recognized the need for co-operation between the developed and developing States and regions throughout the world. However, a rational and comprehensive national environmental plan is still lacking. Formation of such a plan is complicated by several factors, such as the jumble of legal provisions dispersed throughout the legal

¹²⁷ Ibid. pp. 138-142.

system and the lack of institutions which deal directly with the environment.¹²⁸

F.1 The Requirements

In order to fully develop a rational marine environmental policy, five key areas need to be addressed, these are:

1. political will
2. an institution to take control
3. inventory of human and capital resources
4. legislation
5. a plan to implement it

A great many environmental problems and conflicts can be attributed to the underdevelopment of these very basic areas, which are needed to provide a 'big picture' for the various sectors of the government and industry. In 1990, Luis Alvarado, Minister of National Assets and Chair of the National Environmental Commission, spoke about the environmental policy that they were designing for Chile:

"The first task is to design an environmental policy; the second is to draft an environmental code; and the third is to put forward an institutional proposal that will make our policy efficient and our environmental law effective."¹²⁹

¹²⁸ Alvarado, L. (1990). Environment and Diplomacy in the Americas. 'Environment and Development: A view from Chile'. pp. 19-24. Munoz, H. (ed.). Lynne Rienner Publishers. U.S.

¹²⁹ Ibid. pp.19-24.

The minister went on to describe the principles upon which the policy should be based: the first he stated as,

*"We cannot exhaust available natural resources for our own development and leave without any support base for those who will have the task of going forward after us."*¹³⁰

The second and third principles were environmental and energy conservation. The fourth, and perhaps most important guiding principle, was the improvement in the quality of life for Chilean people. The Chilean Constitution states that

*'every citizen has the right to live in an environment free of contaminants and that the state should look after this prerogative, as well as it should preserve nature'.*¹³¹

It was becoming clear that Chile was succumbing to global and national pressure to rid itself of antiquated ideas and traditional methods of developing without taking measures to protect its environment. Despite the lack of a National Environmental Program (NEP), environmental impact assessments (EIA) are being pursued through international and national channels, before major projects are undertaken. The Inter American Development Bank for example will not approve projects or funding until Environmental Impact Assessments are completed¹³².

¹³⁰ *Ibid.* pp. 19-24.

¹³¹ Trucco, R.G. and G. Bellolio. (1991).

¹³² Pablo Fares. (1994). *Canadian Embassy in Chile.* (personal Communication).

F.2 Domestic Legal and Administrative Measures

In order to prevent further degradation to its natural resources, the Chilean State proceeded to initiate the ratification of three international agreements that were integrated in 1977 as Laws of the Republic.

- a) International Agreement to prevent hydrocarbon contamination of water. OILPOL 1954
- b) International Agreement of Civil Responsibility for Damages due to the Hydrocarbon Contamination of Ocean Waters. 1969
- c) International Agreement for the Prevention of Water Contamination due to disposal of debris and other waste materials. 1972.

F.3 Constitutional Framework

To strengthen the need for environmental responsibility, protection of the environment was integrated into the political constitution of 1980. Article 19 #8, specifies that all Chileans have the right to live in an environment that is healthy, clean, and free of pollutants¹³³. Therefore, it is the duty of the government to insure the protection of the environment, not only because of its present or future environmental impact, but also because of legal consequences

¹³³ DIRECTEMAR, (1990). *Territorio Nacional. 'Control de la Contaminacion Marina'*. p.71. Valparaiso, Chile.

of its inactions. According to the Constitution, a clean environment is an inalienable right of all Chileans, in theory (whether in practice would depend on the type of government at the time). In theory, individuals and/or organisations could easily take the government to court if it does not fulfil these duties, which are fully codified laws under the Chilean constitution.

F.4 Law of Navigation

As indicated in the introduction to this chapter, a revolution to dispose of "freedom of the seas" was required in Chile. In 1978, the Law of Navigation assigned the responsibility for its application to the Direccion General del Territorio Maritimo y de la Marina Mercante de Chile (DIRECTEMAR). This institution applies and oversees the compliance to this law, the international agreements and the regulations of the law.

Article 142 establishes, as a rule, that it is absolutely prohibited to dump ballast, garbage, litter, or spill petroleum, its derivatives and residues, water used to wash minerals, or other toxic or dangerous materials of any type, that may harm or endanger national waterways, ports, rivers and lakes. Chile did sign the original London Dumping Convention in August, 1977. In November, 1993 along with 50

other contracting members, Chile attended the Consultative Party to the London Dumping Convention.¹³⁴

It additionally states in article 142 #2, that the Director General must:

a) Supervise, apply and obey all the norms, national and international, present and future, over the preservation of the marine environment, and sanction those that do not comply.

b) Comply with the obligations and undertake the attributions that are assigned through the agreements to national authorities. Additionally, he must promote in the country the adoption of technical measures that help the application of those agreements and the preservation of the marine areas.

Section #4 of the same article, states that: the DIRECTEMAR will buy the equipment, elements, chemical compounds and other means that are necessary to contain and eliminate the damage due to spills, as well as for the adoption, promotion and broadcast of measures to prevent contamination of waters under its jurisdiction.

Section #6 of the same article, establishes that in case of a marine accident or other actions that may produce the contamination of waters, the DIRECTEMAR will adopt those preventive measures that it considers necessary to avert the

¹³⁴ Van der Zwaag, D. (1994). Dalhousie University, Halifax, Canada. (personal communication). Sept. 16.

destruction of the flora and fauna, or avoid damage to the coastal zones of the country.

The Law of Navigation also establishes a special tribunal to deal with all the aspects of the law. The law aims to adapt the legal instruments signed in the Comision del Pacifico Sur, as well as other international agreements. Therefore, the following orders have been promulgated¹⁹⁵:

Order 0-22-003: Organise a complete system to control contamination, to establish procedures according to functions, and to develop contingency plans.

Order 0-22-004: Provide instructions to commanders and officers of Chilean vessels and airplanes on surveillance procedures. How to identify and notify authorities of spills, hydrocarbons or other toxic substances, in national waters.

Order 0-22-006: Provide instructions on how to extract and dispose or unload hydrocarbon mixtures from vessels.

F.5 Administrative Measures: The DIRECTEMAR

In order for Chile to make any progress with encouraging environmental awareness and responsible marine policy development, it requires the support of the DIRECTEMAR. The DIRECTEMAR has been assigned the responsibility to manage the Marine Zones, the Navy and the Merchant Marine. This office

¹⁹⁵ DIRECTEMAR. (1990). Opp. Cit. p. 72.

has also structured a system aimed at making optimal use of materials and human resources. With that purpose, the marine jurisdiction has been divided into five geographical zones, each one being managed by a Regional Centre for the Prevention of Contamination (CERCOM). These centres depend on the National Coordinating Centre that supervises, directs and provides guidelines, as well as support in their activities.

The specific location¹³⁶ of each of the regional centres was selected according to:

- a) importance of activities in the region,
- b) institutional capacity,
- c) distance to other centres of activity and marine traffic routes,
- d) the existence of additional private and public resources that may be available during oil containment activities.

Each centre must organise, direct and coordinate human resources of its own supplies, and those of other institutions, in case of a mishap in its territory. All actions are directed to contain, reduce, and/or eliminate marine contamination by hydrocarbons, spilled from vessels of all types. When an announcement is made of a spill or wreckage, the contingency measures are put into action. Each

¹³⁶ Cofre, M. (n.d.). Plan Nacional de Contingencia para el Control de Derrames de Petroleo en Chile. DIRECTEMAR. Valparaiso, Chile. p. 8.

agent proceeds to their assigned tasks making use of any and all resources deemed necessary. The centre is given the authority to obtain the help and cooperation of other State agencies and private organisations considered imperative for the emergency.

This operational scheme is based on a plan of telecommunication, linking operational sites with the Regional Centres, and each Regional Centre with the National Coordinating Centre. Within this organisational system, the DIRECTEMAR has concentrated its efforts on basically controlling three types of contamination.¹³⁷

A) Contamination caused by vessels, naval artifacts, land installations, terminals and platforms. This involves exclusively the spill of hydrocarbons or other toxic substances. Infrastructure and equipment are periodically inspected, to prevent emergencies due to structural faults, etc. The already mentioned surveillance network contributes to these phases of operation. Additionally, operators of exploration and unloading sites are encouraged, when possible, to install barriers, maintain containment equipment and chemicals for fast control of an eventual mishap.

B) Contamination from land sources with direct or indirect discharges through waterways. This type of contamination is due to waste from domestic, industrial,

¹³⁷ DIRECTEMAR, (1990). *Op Cit.* p. 73.

mining and agricultural sources, that are introduced through natural waterways into the ocean, rivers, lakes and man made waterways, such as sewage systems, etc.

C) Radioactive contamination from vessels, land or natural sources.

On the international level, Chilean environmental actions are carried out under the aegis of the CPPS and include the drafting of a 'Protocolo sobre la Evaluacion del Impacto Ambiental en el Pacifico Sudeste'¹³⁸". This Protocol would require that an environmental impact evaluation be conducted before undertaking any activities or development projects affecting marine or coastal areas¹³⁹. In July of 1983, the Complementary Protocol to the Regional Co-operation Agreement (see above) was enacted at the First Intergovernmental Meeting on the Action Plan, with the approval of the Regional Contingency Plan. The Regional Contingency Plan has resulted in :

"An up-to-date report on equipment available in the region to control oil spills.

-A list of the names of national experts whose assistance could be sought in cases of accidental oil pollution.

-An identification of the critical areas, vulnerable resources and protection priorities against accidental oil pollution in the South-East Pacific.

¹³⁸ Protocol for the evaluation and environmental impact assessment in the South Pacific

¹³⁹ Gallardo, V. A.; A. Camano and S. Gandara. (1991). The Conservation of Aquatic Environments and Resources in Chile. in "UNEP Regional Seas Reports and Studies No. 134, Regional Co-operation on Environmental Protection of the Maritime and Coastal Areas of the Pacific Basin". pp.77-82.

-A proposal for the standardisation of codes for regional communications, within the framework of the Contingency Plan.

-Work on guidelines for economic appraisal of ecological damage due to accidental oil pollution.

-Member Governments being supported in designing and developing their own national contingency plans."¹⁴⁰.

This represents a giant step toward regional co-operation, not just for Latin America, but internationally, because this is the first initiative to promote regional co-operation in "controlling accidental oil spills"¹⁴¹.

With the help of international organisations, such as the United Nations, the Chilean State in conjunction with the DIRECTEMAR, has designed a plan of development, generally known as CONFACSE,¹⁴² which is fully supported by IMO. The activities of this plan¹⁴³ are concentrated in two basic programs:

a) A program of investigation, surveillance and control of marine contamination by Petroleum hydrocarbons in the

¹⁴⁰ Fonseca-Truque, J. (1988). Achievements in the Development of the Action Plan for the Protection of the Marine Environment and Coastal Areas of the South East Pacific. in, "UNEP: 1988 Co-operation for Environmental protection in the Pacific. UNEP Regional Seas Reports and Studies. no. 97, pp. 63-72.

¹⁴¹ Ibid.

¹⁴² Co-ordinated Programme on Marine Pollution Monitoring and Control in the South East Pacific

¹⁴³ Fonseca-Truque. Opp.Cit. p.77.

South East Pacific, and its effects in marine communities.

b) A program of identification and surveillance of marine contamination from domestic, agricultural, industrial and mineral sources in susceptible areas of the Southeastern Pacific.

A contingency plan developed by the DIRECTEMAR (in conjunction with Captain Pizzaro), creating surveillance network in ports and marine areas, with local marine authorities and commanders of vessels and airplanes, has been established. The telecommunications network is the centre that links all the centres for effective control. The Program of Surveillance and Control of the Marine Environment¹⁴⁴ has two components:

a) Plan to Collect and Process Information. The object being to collect, process and evaluate information about the principal sources of contamination, types and levels of discharge. Among those are included industrial, domestic, agricultural and mining discharges. The characteristics of the areas receiving them are also analyzed.

b) Plan to Observe the Coastal Environment. Surveillance and control of marine contamination produced by petroleum hydrocarbons, industrial waste (heavy metals), domestic

¹⁴⁴ *Ibid.* p. 78.

waste and radioactive materials, with the purpose of preventing, minimising, or eliminating water contamination in rivers, lakes, ocean and other bodies of water in important areas of Chile. Special emphasis is placed on areas considered to be reservoirs of natural resources, or special zones of protection, such as: marine parks and reserve zones.

One of the major players involved with Chilean environmental policy is Captain Pizzaro (Marine Consultant, Valparaiso, Chile). He was instrumental in developing a contingency plan for oil spills within Chilean territorial waters. The *Plan de Contingenencia Para Durames de Hydrocarburo* was prepared (with the assistance of Captain Pizzaro) in July and approved by the DIRECTEMAR in October of 1992. The following summer, this plan was implemented at the Con Con oil refinery at Concepcion Bay, and has since been used by other petroleum companies, such as Shell Chile S.A. and ENAP (Empresa Nacional Del Proteleo),¹⁴⁵ which holds the offshore exploitation rights to the east side of the Magellan Strait. Pizzaro's expertise has also become widely used at ports throughout Chile, such as Las Salinas in Vina del Mar, Antofagasto and Chacavuco.¹⁴⁶ Similar contingency plans are developed and used internationally, following a pattern

¹⁴⁵ National Petroleum Company

¹⁴⁶ Pizzaro, A. (1994). Marine Consultant. Chile. (personal communication).

produced by TOVALOP¹⁴⁷ an insurance company which insures 95% of all the tankers in the world. The majority of shipping and marine organizations throughout the world, follow the pattern of the International Tanker Owners Pollution Federation Ltd¹⁴⁸. Environmental management development in Chile was now backed and driven by one of the most powerful institutions in that country, the DIRECTEMAR.

Commander Emilio Leon Hoffman (DIRECTEMAR), and other Chilean Naval personnel, work in direct contact with officials from IMO¹⁴⁹. Working with such a visible and powerful international organization such as the IMO has indicated clearly, that Chile is taking responsible measures to implement policy to protect its marine environment while at the same time striving for sustainable socio-economic development. Chile is presently taking one of the most positive steps in international co-operation by negotiating the signing of MARPOL 73-78. It is expected that they will sign this powerful and instrumental convention by the end of 1994.

¹⁴⁷ *Tanker Owner Voluntary Agreement Liability on Oil Pollution.*

¹⁴⁸ *Ramarino, L. (1994). (personal communication).*

¹⁴⁹ *Ibid.*

G. Educational Program to Protect the Marine Environment

"Governments, industry, trade unions, and consumer groups can all help promote an understanding of inter-relationships between a good environment and good business practices, and integrate this into their action plans¹⁵⁰".

A program has been established in the Port of Valparaiso, Puerto de Quintero and Puerto de los Vilos, by the DIRECTEMAR, to educate the community, with the purpose of changing peoples attitudes and to create consciousness for the need to preserve and protect the environment. This program¹⁵¹ will be divided in two phases: one directed to formal education at an institutional level, through two modules "Water and the Marine Environment" and "Causes of Water Contamination". The second phase is directed at community education, through recreational activities, which is being promoted nationally throughout Chile. The latter part of this educational program provides a useful tool for all constituents and it is based on the principle of Community Base Resource Management (CBRM). CBRM is used throughout the world, and has proven to be very successful with giving the community itself a say in how its resources are managed. The purpose of this Chilean program is to instill among the population, the following concepts:

¹⁵⁰ Agenda 21. Green Paths to the Future. p.27. IDRC. Canada.

¹⁵¹ Rivera, J.V. (n.d.). Program de Educacion y Difusion Para la Preservacion del Medio Ambiente Marino y Dulceacuicola. Academia Politecnica Naval. Escuela de Litoral y Faros. p. 10.

-People are inseparable from the environment, therefore, anything that changes it, will have an indirect effect over the life of people living in surrounding areas.

-Obtain basic knowledge of how to solve environmental problems.

-Be able to think about the responsibilities the individual and the community have collectively and to solve the problems in unison.

-Develop tools of analysis and action to prevent and correct the damage already imparted to the environment. Finding concrete preventive, curative and alternative solutions to environmental problems. (The Canadian Coastguard is promoting a similar educational program, (CAPP) the Community Action Partnership Program)¹⁵².

Chile has also made significant strides in the areas of regional cooperation and governmental reform. Some of these are:

-Convention for the Protection of the Marine Environment and Coastal Areas of the South East Pacific (1981)

-Agreement on Regional Co-operation on Combating Pollution of the South East Pacific by oil and other harmful substances in cases of emergency (1981)

¹⁵² Lawson, J. (1994). (personal communication).

-Supplementary Protocol to the Agreement on Regional Cooperation on Combating Pollution of the South East Pacific by oil and other harmful substances (1983)¹⁵³

Since environmental problems influence decisions about the development of many sectors in Chile, they are essentially linked. Although Chile is considered a leader in the developing world, both technologically and economically, the country has been unable to comply with many of its own constitutional demands or with international treaties designed to improve environmental conditions. This is believed to be because the state is more concerned with economic development than with the environment. However, a lack of sufficient resources, mismanagement of existing resources, outdated pollution control technology and poor implementation of HRD techniques, have played a major role in the failure of Chile to fully develop a national policy on marine pollution or a national oceans act. Developed countries including Canada, whom are recognized as world leaders in environmental issues have also failed in this regard. Federal Minister of Fisheries, Brian Tobin recently attended an International Coastal Zone Management Conference in Halifax. At this

¹⁵³ InterAmerican Development Bank. (1991). Institutional and Legal Aspects in Latin America including the participation of Non-Governmental Organisations in Environmental Management. Washington.

Conference, in referring to a Canada Oceans Act as offering the 'rules to do the job", he said,

"An Oceans Act would give us the legislative authority to do a proper job with respect to the ocean¹³⁴".

This being the case, is our government as well, preoccupied with socio-economic issues? I do not pose this as a question to be answered in this thesis, but it is relevant when answering the same question posed to Chile and other developing countries. One has to refer to the requirements outlined in Section F-1. These are essential to fully develop a rational marine environmental policy as well as a comprehensive National Oceans Act. These requirements apply to developed as well as developing countries.

H. The Legal Framework

A legal framework for the prevention and control of marine pollution, which has its basis in a convention and its three protocols, is currently being enacted by Chile. These internationally agreed legal instruments, ratified and entered into force in 1987, are :

1. *The Action Plan for the Protection of the Marine Environment and Coastal Areas of the South-East Pacific, called the Lima Convention, was adopted by the five S.E. Pacific countries in 1981.*

2. *Agreement for Regional Co-operation to Combat Pollution of the South-East Pacific due to Oil Hydrocarbons*

¹³⁴ *Chronicle Herald. (1994). Tobin to Push Federal Oceans Act. September 22.*

and Other Noxious Substances in Cases of Emergency; Lima Peru, November 1981, and entered into force in 1986

3. *Complementary Protocol to the Regional Co-operation Agreement to Combat Pollution of the South-East Pacific, due to Oil Hydrocarbons and Other Noxious Substances in Cases of Emergency; Quito, Ecuador, July 1983.*

4. *Protocol for the Protection of the South-East Pacific from Land Based Sources; Quito, Ecuador, July 1983.*¹⁵⁵

The United Nations Conventions on Law of the Sea, have resulted in increased efforts by coastal states such as Chile to protect their coastlines from maritime accidents, and comply with international maritime law. "Freedom of the Seas" has been disposed of by these "fully codified" laws.

Chile has made significant strides in the areas of national, regional and international cooperation and government reform. For example, the CPPS, with its focus on marine resources and marine affairs, the signing of the Southeast Pacific regional Environmental Action Program in 1981 (The Lima Convention), the signing of the agreement to combat marine pollution signed in Ecuador in 1983 and in Lima in 1986. Chile has also instituted the following legal framework.

Law-Decree No. 2.222, May 21 1979. "Navigation Law".

Title ix.

Decree No.1, January 6, 1992. Official diary of November 18, 1992. "Regulation to control Water Contamination"

¹⁵⁵ Cabrera, N. (1991). *Op Cit.* p. 1-2

International Agreement on human safety in the ocean, 1974. SOLAS/74 later amendments. Law Decree 3175, January 2, 1980.

International agreement for prevention of Ocean water contamination by hydrocarbons, 1954. OILPOL/54 and its amendments. D.S. 474, 1977, Ministry of External affairs. Antarctic Treaty, Southern Chile, 1959

International agreement on civil responsibility for damages caused by hydrocarbons in water contamination, 1969. CLC/69. D.L. 1808, 1977. Ministry of External affairs.

International agreement for prevention of marine contamination by waste discharge and other materials. 1972. Law-Decree/71. Supreme Decree 475, 1977. Ministry of External affairs.

Manual for International Maritime Organization, IMO for contamination caused by hydrocarbons, parts I, II, III and IV.

Supreme Decree No. 656, July 22, 1983, Official Diary of 24 November 1986. "Complementary Protocol to the agreement on the regional cooperation to combat contamination in the South East Pacific by hydrocarbons and toxic materials.

International Agreement to prevent contamination from ship operations 1973. MARPOL 73/78. Presently in the

process of full ratification and several annexes signed in November, 1994.

International agreement on oil pollution preparedness, response and cooperation, 1990. OPRC/90. (yet in the analysis stage to submit for its approval).

It is evident in this review that the Chilean State has proven its willingness to comply with many international agreements, to the point that the legislative and administrative framework may be considered quite sophisticated. As already mentioned Chile has ratified several annexes of MARPOL in November, 1994¹⁵⁶. Evaluations of the performance of the mentioned institutions to determine the willingness of the State to implement the above mentioned framework did not exist or were unavailable.

¹⁵⁶ Hoffman, E. (1994). Lieutenant Commander, Chilean Navy, (personal communication). Jan.

I. CONCLUSION.

When considering the initiatives of countries involved with participating, developing and implementing international laws and regulations to protect the marine environment, it is found that the process is both time consuming and expensive. Canada for example has taken considerable strides in protecting their oceans by signing MARPOL in 1993. Although Chile has signed some annexes, why has it taken so long?

The complications involved with signing laws concerning the marine environment is best summed up by Captain A. McDonald during his presentation at an IMO sponsored conference in Santa Domingo in 1993 where he says:

"However, I wish to mention here that although Canada was slow in ratifying MARPOL, this was not because it was not protecting its marine environment from ship source pollution"¹⁵⁷.

Captain McDonald went on to say in a subsequent paper at the same conference,

"Why does a pollution prevention regime like MARPOL and its annexes take so long to view full ratification and implementation?. Partly because of a national self interest but partly for of conflicting legislation, plus the problem of funding"¹⁵⁸.

¹⁵⁷ McDonald, A. (1993). Environmental Coastal Area Management. Halifax, Canada. Unpublished paper presented in Santa Domingo. Nov. 1993

¹⁵⁸ McDonald, A. (1993). Environmental Consideration in Port Operation. Halifax, Canada. Unpublished paper presented in Santa Domingo. Nov. 1993.

After this conference my question to Captain McDonald was, "what do you think these national self interests are¹⁵⁹". His response was gain. Economic gain he said, is at the forefront of all countries, but this cannot continue as it jeopardizes the resources for future generations¹⁶⁰.

Many countries in the developed and developing world face these, and other obstacles, in evolving and implementing enforceable laws and mechanisms to protect the oceans and coastal zones¹⁶¹. This chapter has shown that due to global pressures, countries like Chile are portraying a willingness to formulate appropriate marine policy through responsible institutions such as the DIRECTEMAR who have the will and the power to develop and implement a policy framework. Chile, in the past few years has taken positive steps and measures to protect its environment, but it still has a long way to go. The ultimate goal is sustainable socio-economic development, while at the same time taking measures to protect and preserve the marine environment. The "mind set" in Chile is to advance to the status of a developed country. In order to this it must take measures to protect and preserve its natural environment.

¹⁵⁹ Captain A. McDonald. (1993). (personal communication).

¹⁶⁰ Ibid.

¹⁶¹ The Chronicle Herald, (1994). "Tobin to push federal oceans act". Sept. 22.

J. Recommendations

The following policy recommendations are required in order for Chile to reach an effective level of environmental responsibility in regards to marine oil pollution prevention and response.

1. Adopt policies to enforce training and procedures in all areas of oil spill response and preparedness. This should include crisis management and communications.
2. Adopt policies to ensure total cooperation and implementation of its regional contingency plans. This should include a catalog or directory on the physical and chemical properties of all oil being transported.
3. Adopt policies to ensure compliance with international recommendations on environmental impact assessments and socio-economic and natural resource audits.
4. Develop policies and procedures to ensure oil spill response capability in Ports. Oil pollution preparedness exercises would be helpful in this regard.

5. Review and revise existing legislation on oil spill prevention and response to ensure that it is current and complies with internationally accepted laws.

6. Develop policies and strategies where community involvement can be integrated with those responsibilities and obligations of regional centres under the jurisdiction and guidance of the DIRECTEMAR.

7. Develop policies where clear lines of responsibility are listed in regards to financial responsibility for oil pollution incidents. This should be based on the polluter pays principle.

8. Full ratification of MARPOL 73-78.

CHAPTER FIVE: CONCLUSION

As stated in the second chapter of this thesis, the most important challenge for international development practitioners promoting environmental responsibility in the Third World, is not to lose sight of the obstacles faced by these countries and to adhere to them in their studies and recommendations. Based on that fact, this thesis linked such disjointed, and at times contradictory subjects, as social, economic, environmental sustainable development and international and domestic financial relations.

Governing in developing countries is not as simple and clear cut as some people tend to believe. Chapter Three indicates that Chilean governments have historically found innumerable barriers to address the needs of their constituents. In fact, internationalisation and globalization trends of the past twenty years, have contributed to the proliferation of direct and indirect interference by foreign interests - i.e. private foreign investors and creditors, foreign governments and international organisations. Although, the untrained eye would see this as a positive move, foreign interests of this type intervened, not for the benefit of the quality of life of Chileans, but for their own interests and prosperity. As a rule, a profit motive preceded any foreign intervention by these agents. For example, negating credit and negotiation of the Chilean international

debt to Allende's government was not due to consideration for the quality of life of the Chilean people; this fact was made evident by their moderate concern for human rights abuses by the military, and willingness to renegotiate Chilean foreign debt with Pinochet's government.

Additionally, the efforts of the Chilean government to design an elaborate legislative framework proves the desire of the country to collaborate with the demands of international agreements, having these as living proof that they intend to completely comply. However, the apparent indifference to the implementation of the rules, clearly demonstrates the encumbered nature of the decision making process in the Chilean context. Passing laws is an easier proposition than implementing them, especially when they may affect the very people that constitute the lifeline to enough hard currency funds, with which to meet international obligations.

Chile has definitely come a long ways towards economic growth. Tourism, for example has been on a steady incline. According to Cesar Gomez, director of Sernatur, the national tourism service,

"Tourism is our fastest growing sector. We've averaged growth of eighteen percent a year for five years, compared to economic growth of seven percent¹⁶²".

¹⁶² Canadian Business. (1994). October. Advertising Supplement.

But, it is important to distinguish between economic growth and development. In any case, the retention of the "social surplus" so important to the Structuralists has decreased considerably. The country is extremely productive, but the benefits of this production are accrued to the Northern economies and domestic elites, leaving little for social domestic concerns. Consequently, this fact has to be properly internalised by environmentalists and any advice to these countries should not be directed uniquely to domestic governments. Environmentalists should also include lobbying and pressuring international agents, who have clear responsibility for the decision making process in the Chilean State, to implement necessary changes to their own policies.

For example, the reliance of the Bretton Woods Organisations, and latter Chilean governments, on capital accumulation, did not benefit the Chilean society or the environment. As was made clear throughout this thesis, introducing hydrocarbons into the ocean causes devastating "cumulative effects" to the marine environment, living organisms, and marine resources in general. Industrialisation, modernisation and the doctrine of the markets have diminished the present value of natural resources, by denying the possibility of future scarcity and the impact of human made petrochemical substances in the marine environment. Consequently if Chilean marine resources are to be protected for future generations and to the benefit

of its inhabitants, feasibility studies of activities or projects can no longer be based solely on financial considerations. It is important to evaluate the social and ecological impact of activities and/or projects. The effect of international and domestic economic policies negatively impacts on the fibres of the structures of society by showing disregard for their people and the environment. And finally the limited capacity of the ocean for absorption of chemical waste, has to be considered, accepted, understood and challenged.

In this light, the value of "Human Capital", as a factor affecting the growth potential of a country, has to be fully recognised. Social programs have to be directed as development expenditures and as an investment towards a better society, rather than luxuries which countries facing considerable financial responsibilities with international agents, cannot afford to address. It is imperative to improve the quality of life and alleviate poverty of people living along the edges of oceans and waterways. If environmental management practises such as improved oil spill prevention and response measures are developed and implemented, then improvement in the quality of life and alleviation of poverty will result. In this regard, improvement in the quality of life and alleviation of poverty results, in part, from better ocean management practises and policies and effective coastal zone management programs. This is key to sustainable social

and economic benefits derived from fishing, aquaculture, tourism, and recreation and community development. Applying rules and regulations as it is commonly done in northern countries does not ascertain compliance. Consideration must be given to the financial restraints and living conditions which the people living along these coastal areas must endure.

International agents and domestic governments must be concerned and involved with the reality and hardships these countries endure, not only to improve their quality of life and alleviate their poverty, but also to help them reach adequate levels of knowledge and nutrition. They must be provided, therefore, with the tools to properly address new and appropriate technologies to benefit their culture, environment and development needs. As pointed out in Chapter Two, improving "Human Capital" is the link between short-term, social effects and the long-term sustainable development of a country.

Applying this concept to the fact that negligence and intentional spills of petroleum hydrocarbons count for a large percentage of existing marine pollution, the possibility of drastically reducing contamination is more a preventive measure, through education and defined programs, than a containment response. Pollution control, therefore, could be possible if all those intervening in the production, transportation, distribution and use of toxic substances, including hydrocarbons, as well as those directly impacted by

potential marine contamination, have enough knowledge to understand the importance of doing whatever is possible to maintain effective surveillance and/or avoid spilling contaminants into the water (sewage, rivers, lakes and oceans.)

The need for policy development is made amply clear throughout Chapter Four. Preventative measures must be inclusive of all affected parties. For example, the DIRECTEMAR in Chile, in their surveillance plan, has incorporated the collaboration of officers of vessels, as interested parties, to the control of oil contamination. However, those people such as local fishermen (women) who have the highest potential interest to preserve marine resources, have not been included. If it is considered that artisan fishermen and people living in coastal areas could face destruction of their way of life by a single petroleum hydrocarbon spill, then it is reasonable to believe that they would have a higher personal interest than others in the effective surveillance and preventative measures against contamination. Consequently, education programs directed specifically to these communities could create a strong powerful ally in the efforts of this institution. This could also effectively reduce administrative costs of the institutions involved, which could be transferred to these educational programs .

Regard must also to be given to the fact that the preventive rules, designed in international agreements, are based on the experience and interests of northern countries, since developing nations had little, if any, exposure in these matters at the time of negotiations. Chapter Four points out that one of the main interests in the design of the LOS was the extension of national jurisdiction to the 200 mile exclusive economic zone (EEZ). This would increase their economic power by the inclusion of marine natural resources into their national domain. However, they were naturally concerned over the responsibility that they may be acquiring over pollution control and containment measures.

Therefore, the preventive measures incorporated into these agreements may not be appropriate for developing countries. This is so because they are cultured to rely on the use of foreign made chemical substances and/or equipment, as a substitute for labour intensive measures, which are expensive but affordable in the north. However, in the context of developing countries, the reverse measures may be more suitable. It follows that considering this point of view, environmentalists should carefully analyze the recommended measures to ensure that developing nations are not obliged to make use of inappropriate technologies. Other technologies just as effective and of more importance to their economies and cultures, may be easily available without

creating an added drain on the scarce resources of their economies.

Pollution control has to be properly understood by the Chilean State, since their territory has a higher proportion of polluting industries, than normally would correspond with its share of world industry. The possibilities of its natural resources being contaminated by petroleum hydrocarbons, presents a serious environmental risk for Chile. Consequently, the state must take the necessary measures to revise and apply the efficient legislative framework and policies it has prepared.

Experience in developed nations has shown that the application of environmental protection policies have not deterred businesses and industrial development. In fact, environmental products have become an important source for new businesses and technologies. Pollution control can no longer be treated as an economic burden, since the same measures may give rise and stimulate the development of new businesses, encourage economic growth, technological development, production of capital goods, increase in employment and the consequent reduction of pollution.

New and appropriate technologies, if properly instituted are beneficial to development. They could potentially contribute to alter the lifestyle of the population, and affect economic development by absorbing greater "social surplus." Therefore, if a national development policy was

directed to providing the required incentives, new technologies designed for the context of Chilean needs could be generated to reverse the negative effects of the present pollution conditions.

Additionally, Chile could enter the profitable business of pollution control at cheaper costs than any developed nation could, because of its cheaper costs of production. Considering this, Chile could make use of its real comparative advantages, i.e. knowledgeable people able to implement their own indigenous technology.

In conclusion, sustainable socio-economic development should be based on six principles or guidelines:

1. *The Ecological Principle:*

Development must be adapted to nature, restore it, and use it in a way that will maintain it for future generations.

2.- *The Principle of Cultural and Social Integrity:*
Development must be determined within the countries, and not be dictated from outside.

3.- *The Principle of No Violence:*
Development must be peaceful in its direct and structural sense.

4. *The Principle of Emancipation:*
Development must be conducive to self-sufficiency and local control of natural resources and empower and allow the participation of the marginalised masses of society. Additionally, they must be allowed to participate fully in all types of social and economic activities.

5. *The Principle of Solidarity:*
Development must provide basic needs and must improve the life style for all: it must stimulate equality and fair exchange.

6.- *The Principle of Small Errors:*

Development must allow small errors that will not harm the ecosystem and natural resources."¹⁶³

In giving equal value to these six principles, international development practitioners promoting environmental responsibility will not fall to the error of stressing environmental concerns, while disregarding the importance of the "social debt". It is very tempting to do this in times when our global ecosystem is being so severely damaged, and a tremendous emphasis is placed on economic and environmental issues. It should be clear, that a balance between economic, social and environmental issues is needed, giving equal weight to all. I hope I have made it amply clear that social and economic issues are interdependent, and linked to the environment. Hence, they are virtually inseparable.

Maintaining in mind these six principles, and the fact that they are inter-related, these problems can be managed simultaneously. Socio-economic progress in Chile (and the world) cannot continue to go on at the expense of the environment. The marine environment in Chile is a valuable resource, and must be kept free from marine oil pollution and other sources of contamination. However, this resource can be utilized to sustain life on a long term basis if it is managed and preserved, by taking measures to control, reduce and/or eliminate contamination by oil and other degradating sources

¹⁶³ El Desafio Ecologico de los '90: Desarrollo Sustentable mas all de Brundtland. (1991). Diseno Grafico Publicitario. Chile. P. 193.

of pollution. The willingness on behalf of the state to take measures to protect and preserve the environment appears to exist in Chile. By taking reasonable measures, proper allocation of resources and implementing the policy recommendations in Chapter Four, sustainable socio-economic development is achievable in Chile, while simultaneously protecting and preserving the environment.

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