

## **SUSTAINABILITY DIRECTIVES FOR PETROBRAS' EXPLORATION AND PRODUCTION ACTIVITIES IN THE AMAZON REGION**

### **Motivation**

The realization that it is not possible to have infinite economic and population growth on a planet with finite natural resources has highlighted the fact that there is an urgent need for the creation of a new development model. This new model needs to be structured around the ideas encapsulated in the concept of Sustainable Development, namely development that satisfies the needs of the present day without compromising the possibility of future generations being able to meet their requirements (CMMDA, 1988).

Conscious of its role in contributing to the sustainable development of Brazil and the other countries in which it operates, Petrobras has reinforced its commitment to social and environmental responsibility by means of a broad spectrum of actions directed to the integration of these principles in all of its activities. Among these actions, the revision of its Strategic Plan in 2004 is worthy of mention as it stresses the incorporation of the concept of social and environmental responsibility to the mission and vision of the Company. It also extends this to all the countries in which it operates, while emphasizing the enhancement of its governance model with the creation of the Social and Environmental Responsibility Management Committee. These actions are clear proof of the determination to conduct our business by prioritizing fundamental values in the areas of human rights, the environment, labor relations, transparency and the fight against corruption, among others.

Although the need to ensure that the concept of sustainability is included in all of Petrobras activities, this commitment is of paramount importance in oil and gas exploration and production operations in the Amazon Region. This is especially true in view of the aspect of environmental sensitivity, the potential impacts arising from possible accidents and the growing awareness that the Amazon represents part of the natural heritage of humanity. It is also of central importance due to our international visibility and the importance of ensuring our reputation as a company equipped to operate in a socially and environmentally responsible manner in ecosystems that are as complex as those that prevail in that region.

In view of the ecological and social importance of the Amazon Region, Petrobras has elaborated a series of Sustainability Directives with the participation of its Exploration and Production (E&P) business area and the

Amazon Basin Business Unit (UN-AM). This has been done in conjunction with entities and personalities with acknowledged experience in the construction of an ecologically, economically and socially sustainable society - especially in the Amazon Region - with the objective of ensuring the participation of all interested parties in the definition of the main guiding principles of their activities in the region.

The directives include biodiversity protection, eco-efficiency of activities and operations, contingency control mechanisms and the social, economic and cultural interface of oil and gas exploration and production activities in the Amazon region. All of the latter must include the necessary logistical support, including air, land and river transportation, supplies and infrastructure.

In this manner, the themes and concepts prioritized in the participative elaboration process of the directives will provide the central guidelines for territorial occupation, processes, technology, scientific research and the management model proper, in order to enhance oil and gas exploration and production activities in the Amazon region.

### **Overall Objective**

Establish directives to provide guidelines for all Petrobras exploration and production activities in the Amazon region, right through from the intermediary activities through to the final activity, always in accordance with sustainability principles (Elkington, 1997).

### **Specific Objectives**

The elaboration of sustainability directives seeks to achieve the following objectives:

Optimize the consumption of natural resources;

Prevent and mitigate the impact on biodiversity in the different oil and gas exploration and production activities and operations in the Amazon region;

Enhance the management of pollutants and residues generated by activities and operations;

Enhance the management of the recuperation process of impacted areas;

Provide guidelines for the planning and execution of activities involving transport installations and systems;

Provide guidelines for the planning and execution of risk and contingency management activities in order to ensure prevention and effective action in the control of emergencies;

Optimize the impacts of exploration and production activities vis-à-vis the external public;

Improve the quality of life of the workforce;

Promote the preservation of the cultural heritage within the area of influence of E&P in the Amazon region;

Integrate Petrobras' social and environmental responsibility activities in the region with the actions of the Exploration and Production Area in the Amazon region.

### **Benchmarks of Corporate Sustainability and Social and Environmental Responsibility**

The directives proposed in this document were elaborated by the Work Group set up to prepare the Urucu Director Plan, using the following Petrobras benchmarks (1989; elaborated on the basis of Dourado *et al.*, 1988), Miller *et al.* (2005), Elabore (2006) and Almeida (2006).

A guiding conceptual framework was defined for the elaboration of the directives based on the triple bottom line approach (Elkington, 1999). In addition to this, some of the leading international benchmarks on social and environmental responsibility and corporate sustainability were consulted. These include The Global Compact (ONU apud University of Cambridge, 2004), OECD Guidelines for Multinational Enterprises (OECD, 2000), Dow Jones Sustainability Group Indexes (DJSGI, 1999) and the Compendium of Sustainability Reporting Practices and Trends for the Oil and Gas Industry (API.IPIECA,2003).

The triple bottom line approach proposed by John Elkington in 1997 highlights two questions that are considered fundamental for actions geared towards sustainability, namely the integration of the three components of sustainable development – economic growth, social equity and environmental protection, as well as the integration of both short and long term aspects (Elkington apud Almeida, 2006).

Figure 1 represents the concept of sustainability in accordance with the triple bottom line approach, with its three dimensions (Elkington apud Almeida, 2006):



Figure 1 – Corporate sustainability in line with the Triple Bottom Line approach. Source: Elkington, J. apud Almeida, M. (2006)

For the elaboration of the directives presented in this document, the focus was directed towards the environmental and social dimensions located at the base of the sustainability pyramid, by virtue of the fact that the economic dimension has traditionally permeated the actions of the company.

Table 1 shows the relevant inputs of each one of the international benchmarks in the construction of the conceptual framework. Despite being pertinent, some of the themes considered in the benchmarks did not generate directives due to the fact that they involve practices and values that are already deeply rooted in the Petrobras culture.

Benchmark	Date	Type	Scope	Contributions to the directives
OECD Guidelines for Multinational Enterprises	1976. Revised in 2000.	Government recommendations.	Directives addressed to governments with a focus on the activities of multinational companies.	The themes of the recommendations that are of interest to the elaboration of the directives are: general policies; dissemination of information; the environment; science and technology.
The Global Compact	1999.	General principles for the exercise of social and environmental responsibility in companies.	Ten principles classified under four themes: human rights, labor, the environment and corruption.	The principles relating to the environment deserve special attention.

Questionnaire for candidacy to the Dow Jones Sustainability Index (DJSI), oil and gas producing company sector	Launched in 1999 and updated annually	Set of criteria for the selection of companies that are leaders in sustainability.	Criteria grouped according to the dimensions of sustainability (economic, environmental and social) that reflect an international consensus of excellence for the activities of companies operating in the oil and gas sector. On the basis of these criteria, companies applying for inclusion in the DJSI are evaluated and classified.	By reflecting standards of internationally recognized excellence in processes for the planning and management of companies, these criteria provide an important parameter for the quest for higher levels of performance in areas such as emissions, residues, effluents, biodiversity, relationship with the workforce and with the surrounding communities, health and security and others that are directly related to the directives currently being drawn up.
API-IPIECA Compendium.	2003.	Sectorial study for the oil and gas industry showing concepts applicable to each one of the dimensions of sustainability	Prevailing practices in the oil and gas industry; definition of performance policies and indicators geared to sustainability.	The themes considered in the elaboration of the directives are the following: efficiency of resources; analysis of product lifecycles; reduction of emissions; minimization of rejects; biodiversity; prevention of environmental leaks and accidents; job creation; training; local economic impacts; workforce satisfaction and dialogue with the communities.

Table 1 – Chart showing the contribution of international benchmarks in social and environmental responsibility and corporate sustainability. Source: Adaptation by Almeida (2006).

### **Methodology for Definition of the Sustainability Directives**

The guiding conceptual framework highlighted the critical themes for the sustainability of Petrobras’ oil and gas production in the Amazon region with respect to the environmental and social dimensions of sustainability.

The identification of the critical themes associated with the global reduction of environmental impacts was based on the principles of ecoefficiency and the prevention of impacts on biodiversity

The activities involving *installations* and *transport* were also dealt with as critical themes, since the enhancement of the environmental development of

these activities is fundamental in order that the objectives of the Director Plan may be achieved, in view of the fact that these activities underpin all the others. In addition to this, the technological solutions developed for the activities involving installations and transport in Urucu can be transferred – in partnership with the research institutions – to the Amazon communities, making alternative solutions available to society that can improve the lifestyle conditions in a manner compatible with forest conservation.

The theme of *risk and contingency management* deals with the prevention of accidents and readiness to tackle emergency situations involving trained and organized human resources. It also involves specific material resources and procedures to minimize detrimental effects to the health of the workforce, the communities, the environment and humankind's heritage.

The themes of *cultural heritage*, *workforce* and *external public* seek to delineate actions relating to the socio-cultural interface of oil and gas exploration and production activities in the Amazon region.

Lastly, the theme of *communication* covers the institutional drive required for the directives established above to be incorporated as an inherent value in all oil and gas exploration and production operations in the Amazon region.

Considering the dimensions corresponding to sustainability, the critical themes identified are:

**Environmental dimension:** energy and atmosphere, water resources, residues and materials, biodiversity, recuperation of impacted areas, installations, transport and risk and contingency management.

**Social dimension:** cultural heritage, workforce, external public and communication.

Having defined the critical objectives and themes, a set of directives with differing degrees of scope and scale was established

**Macro-directives:** broad ranging directives applicable to all of the themes identified that govern the remaining directives;

**General directives:** directives associated predominantly with one theme, but which have connections with several other themes;

**Specific directives:** specific guidelines for a given theme, the importance of which made them worthy of mention.

Figure 2 illustrates the organization of the directives at their different levels:

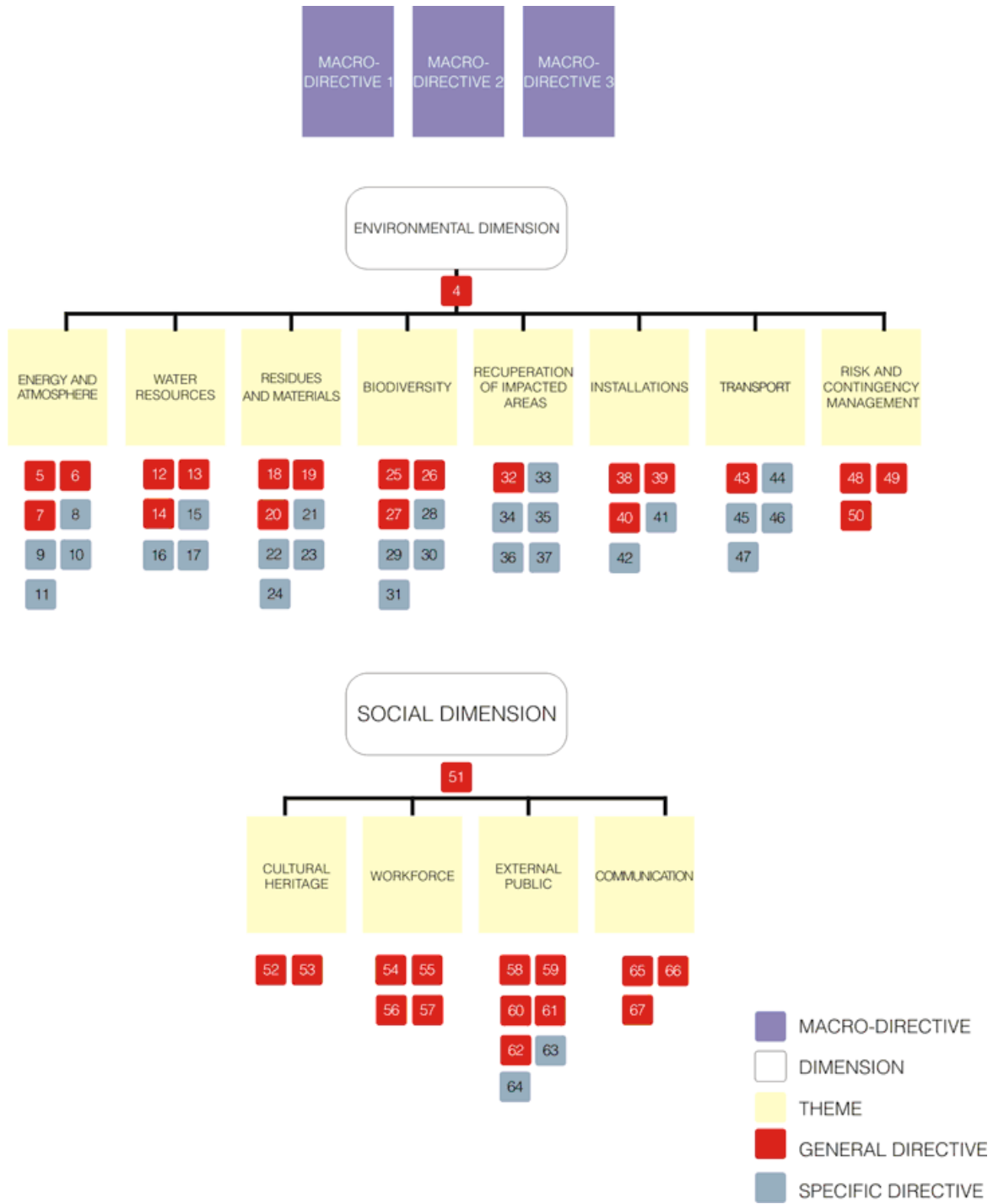


Figure 2 – Schematic drawing of the organization of the directives.

## **Proposal for Sustainability Directives for Petrobras' Exploration and Production Activities in the Amazon Region**

The Macro-directives, the General Directives and the Specific Directives are presented below. The General and Specific Directives were organized in accordance with the dimensions (environmental and social) and with the critical themes to which they are related. The application of the directives should consider the interrelations and overlapping impacts from a systemic standpoint.

### **I. MACRO-DIRECTIVES**

The environmental, social and economic variables should be considered with equal levels of priority in the evaluation of undertakings and operations in the Amazon region;

All of the undertakings and operations should have as their primary consideration the minimization of interference in the natural and ethnic/cultural processes and the promotion of social inclusion;

The concept of sustainability should be considered in all of the stages of the life cycle of undertakings (planning, implementation/construction, operation/maintenance, decommissioning and post-decommissioning).

### **II. GENERAL DIRECTIVES AND SPECIFIC DIRECTIVES**

#### **A) Environmental Dimension**

Analyze painstakingly the risk of negative impacts on the Environment associated with each activity and operation.

#### ***ENERGY AND ATMOSPHERE***

## **GENERAL DIRECTIVES**

Minimize the emission of atmospheric pollutants by means of the adoption of the best technological innovations available that are technically and economically viable.

Mitigate atmospheric pollutants as much as possible thereby reducing the contribution to global warming and the local impacts on the environment.

Minimize the consumption of energy at all levels of activities in order to minimize emissions and the consumption of natural resources relating to the generation of energy.

## **SPECIFIC DIRECTIVES**

Seek to burn minimum gas in flare-off in the production plant, thereby diminishing emissions, energy waste and the consumption of non-renewable natural resources.

Prioritize the use of equipment and processes affording greater energy efficiency.

Seek to use renewable energy sources such as solar energy, biofuels and biomass, taking regional potential into consideration.

Seek to compensate the emission of greenhouse gases by means of carbon sequestration projects and MDL.

## ***WATER RESOURCES***

### **GENERAL DIRECTIVES**

Minimize the consumption of water in installations, activities and operations, decreasing the consumption of a natural resource that is seasonally scarce in the region (water suitable for human and industrial consumption) and reducing the use of energy and other inputs required for treatment thereof.

Minimize the quantity of liquid effluents released, as well as the pollutant content thereof, avoiding any impacts on the aquatic ecosystems and on biodiversity and the alteration of the natural characteristics of the water resources.

Reduce the use of chemical products and prioritize more environmentally appropriate alternatives in the treatment of effluents and the water for human consumption.

### **SPECIFIC DIRECTIVES**

Rationalize the use of water in productive processes prioritizing the re-utilization of internally-used water and final effluents.

Prioritize the capture and use of rainwater by means of collection, treatment and storage in water tanks, in order to reduce spring water consumption and overloading the surface drainage system.

Ensure the sustainable use of the underground water table in order to protect possible reloading areas and avoid predatory exploitation of the aquifers.

### ***RESIDUES AND MATERIALS***

#### **GENERAL DIRECTIVES**

Reduce the generation of residues at all stages of the E&P process, by the use of cleaner technologies and a change in behavior, equipment or processes.

Reduce the introduction of material foreign to the region and prioritize the reduction of residues at source.

Find an environmentally appropriate destination for all residues generated, prioritizing re-utilization and recycling and adopting the best technologies available for treatment as well as technically and economically viable final disposal.

#### **SPECIFIC DIRECTIVES**

Rationalize the production and distribution of food, materials and other inputs, in such a way as to minimize the local generation of residues, increasing the useful volume of inputs transported into the region (prior treatment of products, for example, thereby avoiding unnecessary processing on location).

Prioritize the acquisition of products that generate less packaging residues, by means of prioritization of the purchase of products with durable, reusable and/or recyclable packaging that holds larger product volumes.

Prioritize the local treatment and re-utilization of residues where possible, avoiding the transport of residues, minimizing the consumption of energy and the generation of atmospheric emissions

Whenever possible, use regional materials, products and services that are socially and environmentally sustainable.

## BIODIVERSITY

### **GENERAL DIRECTIVES**

Reduce pressure on the ecosystems that result in impacts on biodiversity throughout the life cycle of all activities and operations, maintaining all existing environmental services.

Contribute to the strategic delineation and management of protected areas in the areas of influence of oil and gas exploration and production activities in the Amazon region by means of financing research to identify priority areas for conservation and support the administration of protected areas established in the area of influence of activities.

Avoid the introduction of live species that are alien to the region and might alter the structure and function of ecosystems.

### **SPECIFIC DIRECTIVES**

Characterize the area of influence of activities, identifying protected, sensitive and vulnerable areas of greater relevance for biodiversity conservation, in which the planning of activities should be made giving due consideration to the specificity of environments and the objective of avoiding environmental impacts.

Characterize the biodiversity of the areas of influence of activities and create mechanisms to systematize the information gathered both in the impact appraisal studies and in the research and monitoring projects.

Reduce the opening up of access channels (roads, trails and the like), minimizing the fragmentation of habitats, avoiding the impact arising from direct destruction of environments for the opening of channels, as well as limiting access to virgin areas of forest and migratory influx (secondary impacts).

Minimize interference in the water flow processes and in the inflow and outflow of rivers and inlets, reducing the impact on aquatic ecosystems and alteration of the natural drainage patterns, preventing impacts on biodiversity and the formation of erosion-provoking processes.

## ***RECUPERATION OF IMPACTED AREAS***

### **GENERAL DIRECTIVE**

Recuperate the areas impacted by E&P activities, seeking to re-establish the structure, functions, diversity and dynamics of the original ecosystems.

### **SPECIFIC DIRECTIVES**

Rationalize the opening of clearings, seeking to reduce deforestation and avoiding the removal of vegetation in areas that will not be immediately used, thereby minimizing the number and area of open clearings and the exposure time of unprotected soil, recuperating degraded areas immediately after the conclusion of activities conducted on location.

Avoid activities that leave the soil exposed during the rainy season in order to avoid erosion and silting.

Use species that are native to the region for the recuperation of degraded areas, including various species of each ecological group.

Optimize the surface run-off of clearings with soil exposed in order to minimize erosion processes and the transfer of sediment to the water retention areas.

Optimize the recuperation of contaminated areas, minimizing the transport of material and the risk of contamination of other areas, monitoring their recuperation over the course of time.

## ***INSTALLATIONS***

### **GENERAL DIRECTIVES**

Select the location of all activities, operations or installations seeking to minimize the conversion of new forested areas and prioritizing the use of locations with less risk of soil loss by erosion processes and with less stocks of biomass.

Apply ecoefficiency principles in the entire lifecycle of installations (conception, project, construction, utilization and demobilization).

Make installations compatible with the local landscape, minimizing the disturbance of the local scenic harmony.

## **SPECIFIC DIRECTIVES**

Within ecoefficiency concepts, prioritize the application of bioclimatic architecture principles, the minimization of water and energy consumption, as well as the minimization of residue generation, the use of renewable materials and the rationalization of construction processes.

Minimize the extension of occupied areas, reducing the area of forests converted and/or disturbed, by means of increasing the occupation density and the optimization in planning of worksites and constructed spaces.

## ***TRANSPORT***

### **GENERAL DIRECTIVES**

Minimize the transportation and movement of equipment, materials and people, reducing wear and tear on access routes, minimizing the natural and human resources necessary for maintenance, the opening of clearings for borrowed material and the risks of impacts related to transportation.

### **SPECIFIC DIRECTIVES**

Seek alternatives for the replacement of tarmac as road surfacing.

Seek alternative forms of transport in order to reduce the need for paved surfaces and the fragmentation of habitats.

Minimize the crossing of access routes over inlet and sinuous valley contours.

Seek solutions for paved routes to allow the free movement of animals

## ***RISK AND CONTINGENCY MANAGEMENT***

### **GENERAL DIRECTIVES**

Apply risk assessment methodologies at all stages of new undertakings or in significant changes in existing operations and installations assisting in the planning of operations and installations and decreasing the risk of accidents and environmental impacts.

Guarantee swift response in potential contingency situations, ensuring the immediate availability of material resources with appropriate quality and quality, as well as qualified human resources.

Use the know-how acquired in social and environmental characterization and monitoring for the planning of contingency activities.

## **B) Social Dimension**

Foster a close relationship with the communities influenced by exploration and production activities, avoiding the generation or increase of social inequalities in the short, medium and long-term arising from such activities and identify opportunities for contributing to company initiatives for the sustainable development of these communities, by means of permanent dialogue with their representatives and with society (Universities, Scientific Institutions, NGOs and Government Organs, among others).

### ***CULTURAL HERITAGE***

#### **GENERAL DIRECTIVES**

Encourage activities of the workforce and suppliers being based on respect of the local values and knowledge and in the preservation of the cultural heritage in the areas of influence of exploration and production activities.

Increase the potential of the resulting benefits from the mutual exchange of experiences between Petrobras and the Amazon region dwellers, adding value and disseminating scientific, technological and traditional know-how in the region.

### ***WORKFORCE***

#### **GENERAL DIRECTIVES**

Guarantee the quality of life in the work locations, improving the standards of lodging, food, health, sport, leisure, culture and communication, promoting the improvement in workplace conditions and minimizing the consequences of physical isolation.

Make access to continued education possible, enhancing the standards of professional training, qualification and development.

Optimize the contingent of personnel allocated to operations, transferring support activities for the operational areas to the nearest cities, when appropriate, thereby minimizing the environmental impacts associated with human presence and simplifying logistic operations.

Encourage and foster the exercise of civic activities by workers in E&P activities, and support voluntary initiatives linked to Petrobras' social responsibility policy.

## ***EXTERNAL PUBLIC***

### **GENERAL DIRECTIVES**

Foster opportunities for the generation of sustainable labor and income among the communities in the areas of influence, stimulating economic and cultural vocations and taking into consideration traditional know-how in such a way as to avoid generating future dependence on E&P activities and contributing to the continued residence of the population in their places of origin.

Enhance the positive impact of E&P activities on the living conditions of local populations, without encouraging the creation of new urban nuclei.

Foster the activities of research groups on topics of interest to Petrobras contributing to extending the frontiers of scientific knowledge, for the incorporation of traditional knowledge and the technological development of the Amazon region.

Whenever possible, prioritize the hiring of local suppliers acting in a sustainable manner, seeking to energize the local economy.

Adopt, by preference, technological solutions that can be replicated in communities in the Amazon region.

### **SPECIFIC DIRECTIVES**

Establish and maintain a permanent monitoring system of the socio-economic and cultural conditions of the human groupings in the area of influence of the activities, identifying opportunity for enhancement of the E&P processes in order to avoid negative social, cultural and economic impacts on these populations.

Prioritize the hiring of suppliers of products and services aligned to the sustainability principles practiced by E&P in the Amazon region, encouraging them to adopt sustainable practices that are compatible with those of E&P.

## ***COMMUNICATION***

### **GENERAL DIRECTIVES**

Disseminate the actions of Exploration and Production in the Amazon region, as well as the results achieved with the application of the directives, in a broad and transparent manner.

Establish communication channels to encourage the exchange of ideas with the external public.

Invest in environmental awareness and education processes seeking the commitment of the workforce with these directives.



## Glossary

**Protected Areas:** Geographically defined areas, which are duly regulated and managed to achieve specific conservation and environmental service objectives, including protection of biodiversity, water resources and the soil.

**Sensitive Areas:** Areas that have less resistance or reduced ability to return to a state close to their original condition prior to being submitted to disturbances. In general, these include environments with a high level of biodiversity and also those that are the habitat for rare species, endemic species (exclusive to a given area) and endangered species facing possible extinction, characterized by the presence of economic and socio-cultural interest and hotspots (areas with a high level of biodiversity and under high anthropic pressure).

**Vulnerable Areas:** Areas liable to suffer potential impacts due to stress agents such as the emission of substances that are potentially harmful to the environment.

**Biodiversity:** In accordance with the Convention on Biological Diversity, this includes “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species (genetic), between species and of ecosystems”.

**Ecoefficiency:** Defined as "the production of goods and services at competitive prices, which meet human needs and enhance the quality of life, while progressively reducing environmental impacts and the intensity of natural resources used throughout their life cycle, to a level that is at least compatible with the capacity of the planet to supply such resources" (Montgomery, 1997). The principles of ecoefficiency include: a reduction of the quantity of raw material used in the production of goods and services; a reduction of the quantity of energy expended in the production of goods and services; a reduction of the production of pollutant residues; an increase in the recyclability of materials; the maximization of the energy efficiency and sustainable use of renewable resources; an increase in product durability; an increase in the intensity of product usage (Desimone & Popoff, 2000).

**Ecological Plant Groups:** Classification of plant species in accordance with their successional stage as pioneers, early secondary, late secondary and climax species.

**Pressures on ecosystems:** Influences generated by human activity that may generate environmental impacts of differing degree.

**External public:** Communities in the area of influence of oil and gas exploration and production operations, suppliers, research and educational institutions, government bodies, NGOs and other civil society organizations.

**Environmental Services:** Benefits that humankind draws from ecosystems. These include provisioning services, such as water and food; regulatory services, such as the control of flooding and disease; cultural services, with spiritual, recreational and social benefits and support services, such as the recycling of nutrients, which maintain the conditions of life on Earth.



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