

# NATIONAL PLAN FOR AIR QUALITY MANAGEMENT IN HONDURAS

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## Abstract

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Contribute to the improvement in air quality, as well as preventing its deterioration, so that within a sustainable human development framework the health of the population is protected with fairness, is the goal of the National Plan for Air Quality Management in Honduras. This plan, developed in accordance to guidelines from the Ministry of Environment and Natural Resources of the Republic of Honduras (SERNA), shows the challenges and opportunities for improving air quality and avoid emissions of greenhouse gases, as part of a central sustainable development policy. The improvement of urban transportation, planning of land use and urban transport, a cleaner and more competitive industrial production, and the conservation and restoration of natural resources in the cities' areas of influence as well as sustainable use of energy, are among the main challenges.

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## 1 INTRODUCTION

The Republic of Honduras, located in Central America, had a population of close to 8 million inhabitants in 2008, of which it is estimated that 45% lived in urban areas, mainly concentrated in the central districts of Tegucigalpa (the Nation's capital) and San Pedro Sula, Honduras' main economic activity center. This last district has an important base of light industry and commercial production of coffee, bananas, meat, sugar cane, tobacco and forest products. In 2006, Honduras climbed 13 positions in the Global Competitiveness Report published by the World Economic Forum (WEF) in Geneva, Switzerland. In 2007, the country's economic growth expanded 6%, so the GDP per capita accumulated a growth of 12% with regards to the 2003-2008 periods. One of the first efforts that were made in this Central American country to improve air quality was in 1993, which funded by the Swiss Agency for Development and Cooperation (COSUDE) and implemented by the Swiss Foundation for Technical Development Cooperation (Swisscontact), the "Pure Air in Central America Program" was carried out. This program also included Guatemala, Costa Rica, Nicaragua, El Salvador and Panama; it allowed actions to support the establishment of a legal framework to regulate motor vehicle emissions, fuel quality and the implementation of a vehicular technical inspection program among other topics.

Since 2001, CESCOCO (Center for Pollutions Study's) assumed the monitoring of air quality in the country's major cities. It installed four automatic monitoring stations (three in Tegucigalpa and one in San Pedro Sula), which were left out of operation due to lack of maintenance and trained personnel. Also, there were no air quality standards to allow setting limits for the health protection of the population from the harmful impacts of air pollutants, mainly total suspended particles (TSP) and particulate matter less than 10 micrometer (PM<sub>10</sub>), whose concentrations exceeded by more than 9 and 4 times, respectively, the average annual limits set by the World Health Organization (WHO).

In 2004, the Department of Statistics from the Ministry of Health reported more than one million cases of medical care for respiratory diseases. 27% of these occurred in Tegucigalpa and most part corresponds to the care of children under age 5 (Geo 2005) [1]. In 2007, the World Bank estimated that more than 500 premature deaths per year could be attributed to urban air pollution in Honduras. The affected population is made up of the elderly, whose life is shortened by exposure to current levels of air pollution (Strukova 2007) [2]. The costs associated with indoor air pollution ascend to 1.117 billion lempiras annually, which equals around 59.3 million dollars a year.

The National Plan was developed by the Clean

Air Institute (CAI) and the Mario Molina Center (CMM) as a support to SERNA, under the coordination of the CESCO. Support was also received from the United Nations Environment Programme and the World Bank, as well as the participation of representatives of several national and international public and private institutions. The Plan was published in 2010 by the Ministry of Environment and Natural Resources from the Republic of Honduras (SERNA) with support from Japan's International Cooperation Agency (JICA).

## 2 OBJECTIVE

The purpose of this Plan was to help improve air quality and preventing it from deteriorating, so that it promoted sustainable human development, protecting the health of the population. The Plan's specific objectives are:

- Reduce air pollutant concentrations in the environment, mainly the breathable fraction (PM<sub>10</sub> and PM<sub>2.5</sub>) and ozone
- Contribute with the reduction of greenhouse gases growth rate
- Strengthen Honduras' air quality management system
- Insert air quality and climate change considerations within the public and private decision making processes on a local and national level.

## 3 METHODOLOGY

The methodology used to design the proposal for the National Plan for Air Quality in Honduras (PNGCA) consisted in integrating an initial diagnosis, in order to determine current and historical conditions that arose since a decade ago in the country. The diagnosis included the collection, review and evaluation of available information from government institutions, mainly SERNA and CESCO; such as, assessments, measurements, previously developed programs and projects on air quality matter. It also integrated emission inventories for both criteria pollutants as for greenhouse gases to determine the main sources and emitting sectors of pollutants into the atmosphere. Based on the above, a proposal was developed that considered five lines of action:

- Sustainable Transportation
- Clean and efficient energy
- Clean and competitive industry
- Ecological restoration
- Capacity, information systems and awareness building

This proposal was submitted in July 2008 in the workshop revision of the proposed National Air Quality Management Plan, in which representatives of institutions and local and international organizations participated, both government and civil society representatives, for the purpose of:

- Disclosing the PNGCA among key participant sectors in its next official establishment, its implementation, technical support, finance and compliance monitoring.
- Enriching PNGCA formulation by consulting representatives of key stakeholders and specialists.
- Analyzing the identified strategies taking into account costs, benefits and co-benefits, as well as requirements for their implementation.
- Identifying cooperation opportunities for the development of the Plan as well as its implementation, monitoring and evaluation.
- Communicating progress in the development of the Plan to the public and the perspectives for its application.

## 4 RESULTS

The results of the diagnosis showed that the main emissions sources to air pollutants and greenhouse gases in Honduras are the Transport and Electricity sectors, as they are also the largest fossil fuels consumers in the country; that is why in a similar manner, priority is given to the prevention and control of air pollution in Honduran cities, as well as greenhouse gases that cause global warming. In the case of transportation, it was estimated that the vehicle fleet could double in the next five years, since the travel distances increase as a result of urban sprawl. Furthermore, there are a high proportion of vehicles without emission control equipment

Figure 1: Air quality in Honduras



Source: Mario Molina Center

whose average age fluctuates around 10 years. This, along with the use of high sulfur fuels and poor maintenance practices, this sector is an important smoke and pollutant gases emitter to the atmosphere.

Regarding public transportation, an oversupply and a high service fragmentation was present, which created an intense competition for passage and a high number of road accidents. The vehicles were over 20 years old as well as in the private transport, high sulfur content fuels were consumed. Public transportation was considered, by the Honduran population as insecure and of poor quality.

As for the electricity sector, energy consumption was growing rapidly, so it was estimated that electricity demand could double between 2000 and 2014. Historically, Honduras generated electricity through hydroelectric power stations. However, in the last fifteen years, they were displaced by thermal power stations, which are now the main source of electricity generation in the country. This resulted in the doubling of fuel expenses for this purpose from 2001 to 2006, year in which the country's oil bill rose about 17% of its gross domestic product.

With regards to air quality, concentration measurements of particulate matter (measured as total suspended particles and  $PM_{10}$ ), showed that they exceed air quality standards established in other

countries and WHO's board of directors in cities like Tegucigalpa. This pollutant is mainly related with emissions generated from urban transport, although they are also associated in some proportion to the re-suspension of dust in streets, unpaved streets emissions and eroded areas, along with some exact sources like lime and brick kilns plants operating in urban surroundings.

Another problem to be solved is forest fires and agricultural burning, which severely reduces visibility. As a result of a concentration increase of primary and secondary aerosols (particles and gases), which predominantly possess sunlight dispersing properties and resulting in economic losses for airlines, tourism and the health sector. This last one, due to an increase in the number of consultations in health care facilities caused by respiratory exacerbation crisis, especially in children under 5.

Furthermore, the lack of emission inventories of criteria pollutants for the country's cities was revealed, which means a serious limitation for decision making on the subject and the construction of agreements with key sectors to adopt the necessary measures. It is important to note that SERNA updated its National Inventory of Greenhouse Gases as part of the task to prepare its Second National Communication to the United Nations Framework Convention on Climate Change, as well as an inventory of persistent

organic compounds to meet its obligations under the Stockholm Convention. These works contain common information with inventories of criteria pollutant emissions, such as the characterization of sectors, activities and processes that generate the different substances, so it is convenient to coordinate efforts between the offices involved in its development to maximize the available resources.

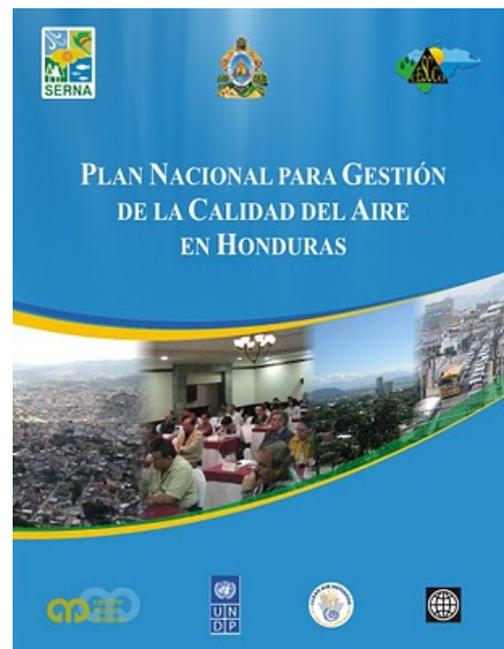
From the considerations above mentioned, the Clean Air Institute and the Mario Molina Center developed the Proposal of the National Plan for Air Quality Management in Honduras, emphasizing the following as priority actions:

1. To regulate the import of all kinds of motor vehicles with energy and environmental criteria
2. To introduce ultra-low sulfur gas and diesel and establishing specifications for fuel imports
3. To assess environment, social and economic impacts of biofuels
4. To implement a program of emissions inspection and mechanical and safety aspects for all circulating vehicles
5. To develop a program that improves urban transportation and air quality
6. To implement an emission reduction program in the electricity sector
  - (a) Implementation of a saving and efficient use of energy program
  - (b) Implementation of a renewable energy development program
  - (c) Establishing regulations to ensure that new power generation stations are cleaner and more efficient
  - (d) Implementation of an electricity's efficient use program
7. Implementation of a program to prevent and cut down industrial facilities' emissions
  - (a) Implementation of the Cleaner Production Strategy
  - (b) Single Environment License and Emissions and Pollutant Transfer Registry
  - (c) Industrial emission control and monitoring
8. Ecological restoration and forest firefighting

## 9. Strengthening of air quality management

- (a) Establishing air quality standards
- (b) Strengthening the air monitoring in Tegucigalpa and San Pedro Sula and its public disclosure
- (c) Develop 2009 emissions inventories for Tegucigalpa and 2010 for San Pedro Sula.

Figure 2: National Plan for Air Quality Management in Honduras



Source: SERNA, 2010

## 5 CONCLUSIONS AND RECOMMENDATIONS

Honduran cities face serious problems related to rapid urbanization and the need to provide people with a better quality of life. Urban transportation, industrial development and energy security are among the main challenges to overcome. Opportunities exist for the development and implementation of measures to address these needs, moving towards a substantial improvement in air quality and public health through the design of appropriate measures to reduce local air pollution and contribute to emission mitigation of greenhouse gases, generating environment, social and economic benefits.

The National Plan for Air Quality Management in Honduras is focused on achieving these benefits, supporting policies to reduce air pollutants and greenhouse gas emissions, promoting the development of urban transportation, promoting cleaner production and energy efficient use in Honduran cities. At the same time strengthening the air quality management process in the country, making continuous dialogue easier and building political commitment of the institutions involved, improving institutional capacity and development of quality management tools, in the context of sustainable development in Honduras.

Nowadays, CAI is developing the second phase of the National Plan in collaboration with SERNA and with the support again of World Bank. This phase develops the project "Characterization and Evaluation of Measures in the Transportation Sector to Reduce Air Pollution in Tegucigalpa". It also identifies with international cooperation agencies, such as the Society for Technical Cooperation from the Government of Germany (GIZ), Japan's International Cooperation Agency (JICA), the Pan American Health Organization (PAHO) and the United Nations Development Programme (UNDP), areas of opportunity for the development of strategies to reduce air pollution in the city of Tegucigalpa in scenarios up to 2030.

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