

The World Bank Clean Air Initiative in Sub-Saharan African Cities

1998-2002 PROGRESS REPORT

Working Paper Number 10
January 2003





PROGRAM COORDINATION FOR THE WORLD BANK CLEAN AIR INITIATIVE IN SUB-SAHARAN AFRICAN CITIES

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THE WORLD BANK GRATEFULLY ACKNOWLEDGES THE FINANCIAL CONTRIBUTION AND SUPPORT FROM:

The Belgian Cooperation

The Energy Sector Management Assistance Program (ESMAP)

The Nordic Trust Fund for Environmentally and
Socially Sustainable Development (NTFESSD)

FOREWORD

Urban Air Pollution generated by motorized transport has become an increasing threat in sub-Saharan African cities due to the combination of fast growing population, increasing motorization of old vehicles and lack of appropriate traffic management measures. Every study carried out in cities such as Dakar, Ouagadougou, Cotonou, Abidjan, Douala confirms this alarming trend.

The Clean Air Initiative in sub-Saharan Africa was launched in 1998 to address these issues and prepare, with African Authorities, Action Plans to reduce the impacts of urban air pollution. Since June 2001, the elimination of lead from gasoline has become one of the key topics of the Program's agenda: there is an overall consensus to eliminate lead from gasoline in sub-Saharan Africa by 2005 at the latest.

This Progress Report highlights the objectives of the Initiative, its achievements during the period 1998-2002, as well as its proposed future. Such milestones have been reached thanks to the large partnership built during the Program, encompassing public and private partners, including the oil industry, African Authorities at local, national, and sub-regional level, environmental agencies, and the AFRICACLEAN network of African experts.

The progress made since 1998 has been to a large extent achieved thanks to the large coalition of technical and institutional partners. We would like to take this opportunity to thank all the stakeholders for their contribution but more importantly for their beliefs that combined efforts can make the difference for a better urban environment in Africa.

Based on the assessment of the recent achievement, the Clean Air Initiative will pursue its overall objective of contributing to the reduction of air pollution generated by motorized transport. This effort is carried out in the context of the worldwide Clean Air Initiative and in the spirit of the World Bank's overall urban strategy which aims to make cities more livable and ensure that the poor achieve a healthful and dignified living standard.

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ACRONYMS & ABBREVIATIONS

AECLP	Alliance to End Childhood Lead Poisoning
AfDB	African Development Bank
ADEME	Agence de l'Environnement et de la Maîtrise de l'Energie
AGETUR	Agence d'Exécution des Transports Urbains (Benin)
AQ	Air Quality
BP	British Petroleum
CAEMU	Central African Economic and Monetary Union
CBO	Community Based Organization
CEDEAO	Communauté Economique des Etats de l'Afrique de l'Ouest
CETUD	Conseil Exécutif des Transports Urbains de Dakar
CUD	Communauté Urbaine de Douala
CERTU	Centre d'Etudes sur les Réseaux, les Transports, l'Urbanisme et les constructions publiques
CTESP	Comité Technique de l'Essence sans Plomb (du Burkina Faso)
DGF	Development Grant Facility
EC	European Commission
ECOWAS	Economic Community of West African States
ESMAP	Energy Sector Management Assistance Program
EU	European Union
FPSI	Finance, Private Sector and Infrastructure (World Bank sector network)
FOTE	Friends of the Environment
GEF	Global Environmental Facility
GDP	Gross Domestic Product
GNP	Gross National Product
IDA	International Development Association
IPIECA	International Petroleum Industry Environmental Conservation Association
LAC	Latin America Countries
MELISSA	Mitigating Environment Locally in Sub-Saharan Africa
MDP	Municipal Development Program
NAAMSA	National Association of Automobile Manufacturers and Assemblers of South Africa
NAC	National Automotive Council (of Nigeria)
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
NMT	Non Motorized Transport
NNPC	Nigerian National Petroleum Corporation
NTFESSD	Nordic Trust Fund for Environmentally and Socially Sustainable Development
OAU	Organization of African Unity

ACRONYMS & ABBREVIATIONS

PM	Program Management
PREM	Poverty Reduction and Economic Management (World Bank sector network)
R&D	Research & Development
RON	Research Octane Number (fuel performance rating)
SADCC	Southern African Development Coordination Conference
SAR	Société Africaine de Raffinage du Sénégal
SITRASS	Solidarité Internationale sur les Transports et la Recherche en Afrique Sub-Saharienne
SIR	Société Ivoirienne de Raffinage
SON	Standards Organisation of Nigeria
SSA	Sub-Saharan Africa
SSATP	Sub-Saharan Africa Transport Policy Program
TF	Trust Fund
TOR	Tema Oil Refinery (of Ghana)
UEMOA	Union Economique et Monétaire Ouest Africaine
UITP	Union Internationale des Transports Publics
UM	Urban Mobility
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
USEPA	United States Environmental Protection Agency
WAEMU	West African Economic and Monetary Union
WBI	World Bank Institute
WHO	World Health Organization

OVERVIEW

This progress report summarizes the activities and achievements of the Clean Air Initiative in Sub-Saharan African Cities during its initial 1998-2002 phase, and previews the road ahead. The report is intended for the Initiative's partners and the many observers who are following this innovative regional program with great interest: local governments, national and international institutions, private companies and entrepreneurs, foundations and universities, and consumer and community groups.

The Clean Air Initiative in Sub-Saharan Africa was launched in 1998 by the World Bank, in the context of the Sub-Saharan Africa Transport Policy Program (SSATP-Urban Mobility) and the worldwide Clean Air Initiative coordinated by the World Bank Institute. It is the first program in Africa that seeks to reverse the urban air quality deterioration due to vehicle emissions, by far the most important source of urban air pollution in Africa.

The Initiative focuses on the large cities of Sub-Saharan Africa, which have experienced sustained high levels of urban growth over the last several decades, accompanied by increased motorization, old vehicles, low-quality fuels and low investment in traffic management. Africa lags behind in vehicle inspection and air quality standards and is also one of the last regions to continue using leaded gasoline, thus resulting in high levels of air pollution that has debilitating effects on the environment, health and productivity. The poor, especially women and children, who walk and live in closest proximity to busy streets, are at greatest risk.

The elimination of leaded gasoline has now become the key priority of the program, given the consensus to consider the phase-out of leaded gasoline as a first step towards the overall objective of reducing urban air pollution and improving the quality of life in African cities.

The Initiative supports conferences, research, and investments culminating in the implementation of locally designed air quality action plans in key cities of the region.

The initial expectations of the Initiative's first phase have been surpassed in terms of raised awareness, countries included, partnership, overall commitments and local community participation. Delegates from 25 Sub-Saharan African countries, representing a diverse range of national and local government bodies, research and academic institutions, NGO's and international organizations, who attended the regional conference on the phase-out of leaded gasoline (Dakar, Senegal, June 26-28, 2001) agreed to join efforts to accelerate the formulation and implementation of sub-regional action plans to completely phase-out leaded gasoline in Sub-Saharan Africa as soon as possible, and at the latest by 2005. A new interdisciplinary network of African professionals, AFRICACLEAN, has been created to promote awareness, manage research, and monitor progress.



The program's main activities and achievements in 1998-2002 are summarized in the next chapters. The report also presents regional air quality issues, program governance, and summaries of city air quality studies, seminars, action plans, networking and training, and research activities. The last chapter previews the road that lies ahead for the next phase of the Clean Air Initiative in Sub-Saharan Africa. Program operation guidelines, AFRICACLEAN network program, financial statement, June 2001 Declaration of Dakar on the Phase-Out of Leaded Gasoline in Sub-Saharan Africa, sub-regional action plans, and list of publications are found in the Annexes.

PROFILE OF CLEAN AIR INITIATIVE IN SSA

BACKGROUND

The Initiative began in mid-1998, in the context of preparation of the Senegal Urban Mobility Project, which included a study on external costs in Dakar's urban transport system. The study clearly demonstrated the growing negative impact of urban air pollution. It was then decided that a specific case study on air pollution in Dakar should be prepared, followed by a national awareness seminar, thus providing the occasion to formally launch the Clean Air Initiative in SSA (Dakar, December 1998) as part of a collaborative effort between the Africa Region and the World Bank Institute (WBI), itself operating in the context of its worldwide Clean Air Program.

The Initiative focuses on the large cities of Sub-Saharan Africa, which have experienced sustained high levels of urban growth over the last several decades. Studies carried out since 1998 in Dakar (Senegal), Ouagadougou (Burkina Faso), Cotonou (Benin) and Abidjan (Côte d'Ivoire) indicate that urban air pollution negatively impacts the economy by 1.8 % to 2.7 % of G.D.P. If nothing is done in the near future, this impact is expected to increase significantly given the effects of urban population growth and increase in car ownership.

The Clean Air Initiative has been designed in the spirit of the World Bank's overall urban strategy, which proposes an agenda for working with both national and local governments to develop sustainable cities. It is in line with urban transport and urban environment projects under preparation or implementation. Its approach is also coherent with the Finance, Private Sector and Infrastructure (FPSI) and the Poverty Reduction and Economic Management (PREM) goals of the World Bank to reduce poverty through increased economic growth and development of the private sector, and to improve the health and well being of the urban poor.

Through awareness, research, and networking, the Initiative estimates it will spur public and private spending to eliminate lead in gasoline and clean up vehicle emissions, leading to potential benefits such as fewer premature deaths, lowered rates of illness, and fewer hours lost in traffic jams.

The Initiative also relies on extensive partnership with the private sector (oil and automobile industry, local transporters and mechanics) as well as local associations and community groups.

OBJECTIVES

The main objectives of the Initiative are to:

- Raise stakeholder awareness of the dangers of urban air pollution, especially for those at highest risk—children and their mothers, street vendors, and pedestrian commuters—and the implications of vehicle and fuel choices;
- Evaluate baseline vehicle emissions measures, air quality, pollution exposure, and pollution effects, and monitor change over time;
- Identify the most cost-effective measures targeting changes in vehicles, fuels and, traffic management, and the most effective and enforceable;
- Design, implement, and monitor the impact of Air Quality Action Plans designed to reduce pollution, including clear, measurable, and enforceable goals for reducing pollutants. ***The phasing-out of leaded gasoline in SSA is identified by all partners as the top priority;***
- Strengthen local expertise on air pollution; help to develop a network of professionals in the field

ACTIVITIES

The activities chosen to achieve these goals are:



- Pilot studies in key cities representative of the various modes of motorized transport (public, private, mopeds) to determine the sources and impacts of air pollution and probable future scenarios with and without emission reduction measures. Cities are chosen for their stated commitment to be part of the program. In each of the cities, the Initiative involves the preparation of specific case studies, national awareness seminars, identification of priorities for policy and regulatory reforms, and specific action plans are implemented.
- Seminars in the partner cities designed to bring together people from the public health, transport, environment, energy, and urban planning sectors, along with the private sector dealing in vehicles and fuel, and community environment groups, in order to share their expertise and determine action plan measures.
- Funding of specific research to fill gaps in existing knowledge.
- Publication and distribution of conference proceedings and research reports, along with educational audio-visual materials, a video on the issues of leaded gasoline in SSA, and a website.
- Contributing to the development of sub-regional and national air pollution databases.
- Initiation and support of a network of African expertise on pollution issues (AFRICACLEAN).

These activities were designed to overcome the specific constraints faced by partner country authorities: lack of awareness concerning the dangers of urban air pollution, lack of data on emissions and their impact needed in order to select the most cost-effective action plan measures, lack of technical expertise, and absence of interdisciplinary sub-regional institutions to coordinate activities.

They also reflect lessons learned from other regions in the world, primarily Asia and Latin America, where experience has shown that a few well-chosen and inexpensive measures can go a long way to reducing the worst of urban air pollution and that support for a coordinating organization at the sub-regional level and for monitoring and enforcement at the country level is critical.

ACHIEVEMENTS TO DATE

The Initiative has had impacts at three levels: in the partner cities, at the sub-regional level and at the regional level. Following its initial launch in Dakar in 1998, the Initiative has financed four urban air quality improvement studies in: Dakar, Senegal (1998), Ouagadougou, Burkina Faso (1999), Cotonou, Benin (2000), and Douala, Cameroon (currently underway since 2002). A fifth study, financed in the context of a World Bank transport sector operation program, was conducted in Abidjan, Côte d'Ivoire (2001). Recommended air quality improvement action plans were presented at the three follow-up national seminars in Senegal, Burkina Faso and Benin.

In 2001, the phasing-out of leaded gasoline became the primary focus. The regional conference on the phase-out of leaded gasoline in Sub-Saharan Africa, launched in Dakar (June 2001), resulted in the Dakar Declaration (see the Annexes) with the commitment of representatives of 25 countries to phase out leaded gasoline in SSA

by 2005. Four follow-up conferences have since been held: a national conference in Abuja, Nigeria (November 2001) and three sub-regional conferences in Dakar, Senegal (March 2002), Cotonou, Benin (April 2001) and Nairobi, Kenya (June 2002).

The Initiative also supported the establishment and development of AFRICACLEAN, a network designed to promote the networking among individual experts from Africa and elsewhere.

Initiative-funded publications have included several research technical notes and reports, proceedings of conferences and seminars, a video documentary "Leaded Gasoline: A Silent Threat" designed for TV broadcasting in English and French throughout Sub-Saharan Africa (June 2001), and a quarterly newsletter published on the World Bank Clean Air website and distributed to subscribed members.



Following is a more detailed summary of the achievements to date:

- **City case studies on air pollution** (Dakar, Ougadougou, Cotonou, Abidjan, and Douala) and follow-up national seminars in Senegal (December 1998), Burkina Faso (June 1999), and Benin (October 2000). The Douala study initiated in 2002 is still in progress.
- **Publications on air pollution in African cities** (see list of publications in the Annexes).
- **Prime topic of the SSATP-Urban Mobility Steering Committee Meeting**, Cotonou (October 1999).
- **Training sessions on air pollution**, Abidjan, Côte d'Ivoire (July 2000), Montreal, Canada (October 2000), Lyon, France (July 2001 and July 2002), and Addis Ababa (May 2002).
- **Meetings with the oil industry** (IPIECA, Exxon Mobil, TotalFinaElf, BP, etc.), in the context of the decision to phase out leaded gasoline in SSA, Paris (February 2001).
- **Special session of the SSATP-Urban Mobility Steering Committee meeting**, Accra, Ghana (April 2001).
- **Brochures "Clean Air Initiative in SSA" and "Regional Conference on the phasing-out of leaded gasoline in SSA"**, in English and French (June 2001).
- **Video "A Silent Threat"**, available in English and French (June 2001) produced for distribution to TV medias, partner organizations, and individuals; and designed to promote public awareness on the threat of leaded gasoline in African cities, and the need to phase it out.
- **Website development** of the Clean Air Initiative in Sub-Saharan Africa (June 2001): www.worldbank.org/cleanair
- **Regional conference on the phasing-out of leaded gasoline in SSA**, Dakar (June 26-28, 2001), which resulted in the Dakar Declaration (see the Annexes). Proceedings report available in English and French.

- **First Steering Committee meeting of the Initiative**, Dakar (June 29, 2001); the rules of operation were discussed and approved by the main stakeholders (see the Annexes).
- **National conference on the phasing-out of leaded gasoline in Nigeria**, Abuja, Nigeria, (November 15-16, 2001). Proceedings report available in English.
- **Sub-Regional conference on the phasing-out of leaded gasoline in West Africa**, Dakar, Senegal (March 26-27, 2002). Proceedings report available in French with key extracts in English.
- **Sub-Regional conference on the phasing-out of leaded gasoline in Nigeria & Neighboring Countries**, Cotonou, Benin (April 11-12, 2002). Proceedings report available in French with key extracts in English.
- **Sub-Regional conference on the phasing-out of leaded gasoline in East Africa**, Nairobi, Kenya (June 5-7, 2002) in partnership with UNEP, USEPA and IPIECA. Proceedings report available in English.
- **Urban Traffic and Air Pollution Training Session at the Urban Transport & Mobility Training Program for Eastern and South Africa**, Addis Ababa, Ethiopia (May 13-17, 2002) in partnership with SSATP-Urban Mobility and MDP.
- **Urban Air Pollution Session at the SSATP-Urban Mobility Conference**, Maputo, Mozambique (July 1-5, 2002).

ORGANIZATION & GOVERNANCE OF THE CLEAN AIR INITIATIVE IN SSA

The Initiative started with a small task force of technicians and representative authorities from the partner cities and worldwide experts. A formal Steering Committee, composed of representatives from the partners, was created in 2001 to monitor and guide the Initiative.

FUNDING AND PARTNERSHIPS

Primary funding of the SSA Initiative, begun in 1998, comes from the Nordic Trust Fund for Environmentally and Socially Sustainable Development (NTFESSD) and the Belgian Cooperation Agency. Since 2001, the Energy Sector Management Assistance Program (ESMAP) also contributes. Other donors include Canada, through the Montreal Twinning Program (involving the cities of Cotonou and Dakar), and the International Petroleum Industry Environmental Conservation Association (IPIECA). The European Union is currently considering joining the Initiative.

A summary of the financial funding and spending for the Initiative, for the fiscal years 1999 to 2003, is given in the Annexes.

The Initiative is also based on the development of a sustainable partnership with local and national African authorities and other various agencies including:

- **Multilateral Agencies and Institutions**

- African Development Bank (AfDB)
- European Commission (EC)
- Municipal Development Program (MDP)
- United Nations Economic Commission for Africa (UNECA)
- United Nations Environment Programme (UNEP)
- World Health Organization (WHO)

- **Sector Program**

- Energy Sector Management Assistance Program (ESMAP)

- **Bilateral Organizations**

- Belgian Cooperation
- Nordic Trust Fund for Environmentally and Socially Sustainable Development (NTFESSD)
- U.S. Agency for International Development (USAID)

- **Environmental Agency**

- U.S. Environmental Protection Agency (USEPA)
- Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME)

- **NGOs and Research Institutions**

- Alliance to End Childhood Lead Poisoning (AECLP)
- Friends of the Environment (FOTE)
- Mitigating Environment Locally in Sub-Saharan Africa (MELISSA)
- University of Brussels
- U.S. National Safety Council

- **Conference Host Institutions**

Benin Ministry of Environment, Housing and Urban Development
Committee on the Phase-out of Leaded Gasoline in Nigeria
Executive Council of Urban Transport of Dakar (CETUD)

- **Petroleum Industry Organizations**

International Petroleum Industry Environmental Conservation Association (IPIECA)
Nigerian National Petroleum Corporation (NNPC)

- **Networks of African Experts**

Regional Network of African Experts on Urban Air Pollution (AFRICACLEAN)
Solidarité Internationale sur les Transports et la Recherche en Afrique Sub-Saharienne (SITRASS)

- **Other Partners**

Beicip-Franlab
City of Montreal
International Union of Public Transport (UITP)
National Association of Automobile Manufacturers and Assemblers of South Africa (NAAMSA)
Nigerian National Automotive Council

COORDINATING UNIT

The World Bank provides the Initiative's Coordinating Unit and Technical Secretariat, which coordinates activities such as regional seminars, in accordance with the work schedule adopted by the Steering Committee. It carries out fundraising and manages trust funds following World Bank guidelines. It convenes Steering Committee meetings, publishes research results and conference proceedings, and proposes work programs and regional structures for the Initiative's subsequent phases.

STEERING COMMITTEE

The Steering Committee includes representatives from:

- National focal point partners
- UNECA, MDP
- The World Bank, AfDB, WHO, UNEP, the European Commission
- Main cooperation donors
- International environmental agencies
- Selected private organizations
- Regional network of experts (AFRICACLEAN)

Other individuals or institutions may be invited to attend meetings as observers or scientific observers.

The Steering Committee's function is to debate strategic issues and provide overall guidance. It reviews activities carried out as reported by the Coordination Unit and the National Committees, discusses and adopts the action programs proposed by the Coordinating Unit.

NATIONAL FOCAL POINTS

Each African country partner has already designated, or will designate, local coordinators or “national focal points” to work with local stakeholders: ministries of environment, transport, energy and health, city governments, and representatives of the health sector, fuel and vehicle industries, and user associations. These focal points will bring stakeholders together in order to conduct national and local activities in support of urban air quality action plans. These activities include the organization of national seminars, liaising with the AFRICACLEAN network and the World Bank Coordinating Unit, preparation of the action plans, contributing to the development of national air quality databases, and facilitating the regional distribution of information.



FOCAL POINTS IN PARTNER COUNTRIES TO DATE ARE:

1. Benin: Ministry of Environment, Housing & Urban Affairs
2. Burkina Faso: Ministry of Infrastructures, Transports and Housing
3. Cameroon: Douala Urban Community(CUD)
4. Cote d'Ivoire: Ministry of Environment
5. Ghana: Accra Metropolitan Authority
6. Kenya: United Nations Environment Program (UNEP)
7. Niger: Ministry of Mines and Energy
8. Nigeria: National Automotive Council of Nigeria
9. Senegal: The Executive Council of Urban Transports of Dakar (CETUD)
10. Togo: Ministry of Environment

EMISSIONS, IMPACTS, AND SOURCES OF URBAN AIR POLLUTION

POLLUTANT EMISSIONS AND IMPACTS

As Sub-Saharan African cities experience increased urbanization and motorization, air pollution, particularly from vehicles still using leaded gasoline, is becoming worse. By providing access to business and public facilities, urban transport plays a critical role in the development of urban areas and overall economic growth but it also results in external negative factors such as accidents, noise, traffic congestion, and air pollution. The latter is becoming a major environmental and health concern in Sub-Saharan Africa. High rate of urbanization (4% to 8% in a number of cities) that is expected to be sustained for the next decade, combined with low-income solutions to daily commuting, has resulted in the rapid increase in pollutants emitted by motorized vehicles. Low-income levels have resulted in the import of older used vehicles in recent years, the use of cheap two-wheelers and cheap fuel, and the postponement of vehicle maintenance.

Such conditions multiply the emissions per kilometer traveled many times, as do slow speeds due to low investment in road maintenance and traffic management. Roadway conditions are poor, vehicles are not inspected, fuel quality is poor, and public transportation is undersupplied and unaffordable for many residents. Walking is still a major transportation mode in African cities, whereby the poor are exposed to hours of breathing highly polluted air. Forty percent of urban trips are made on foot and sidewalks are often missing or in disrepair. The many roadside vendors, mostly women, are exposed throughout the day.

Following is a brief description of the major pollutants emitted by motorized vehicles and of their respective health impacts.

LEAD

Lead added to gasoline is the most harmful pollutant from vehicle emissions. The serious health impacts resulting from this have been extensively researched and documented and are widely acknowledged. Lead is an insidious and slow-acting poison that is easily absorbed and remains in the body.

When people breathe in airborne lead from emissions, it accumulates in the body tissues and leads to anemia, hypertension, and permanent loss of brain function, particularly in infants and children. Exposure to lead has been shown to reduce intelligence quotients in children by 2-3 points for every additional 100 micrograms/liter of lead in children's blood. Children are at greatest risk, especially very young children, because their digestive systems absorb lead much more readily than adults, and it accumulates in the soil where they play and gets on their clothes and toys. The result is not only illness but also permanently stunted mental capacity. Poor children are most at risk because malnutrition intensifies lead absorption.

Lead causes elevated blood pressure, cardiovascular conditions, neurological and kidney-related diseases in adults, resulting in productivity loss and earlier deaths from air-borne toxins.

Recommended World Health Organization (WHO) air quality guideline for lead (Pb) content in the air is low, as exposure to even small amounts can be harmful:

WHO air quality guideline for lead: $0.5 \mu\text{g Pb}/\text{m}^3$, as an annual average

Africa and the Middle East are among the last regions where motorized vehicles still run almost exclusively on leaded gasoline. In 1993, motor vehicles in Africa emitted over 13 million tons of lead, or almost a quarter of the global annual lead emissions of 60 million tons.

Experience worldwide has demonstrated that switching to unleaded gasoline is practicable, technically feasible, cost-beneficial, and can be done quickly, in both developed and developing countries. As a result, many countries around the world have eliminated lead additives from gasoline, and over 80 percent of gasoline sold worldwide is now unleaded, Africa remains one of the exceptions.

Eliminating lead from gasoline has been identified as a priority, not only because of the harmful content of lead, but also because of the triggering effect it has on pollution. The use of unleaded gas is a prerequisite to introducing catalytic converters which, in turn, can help reduce pollutants by as much as 90 percent.

Switching to unleaded gasoline will quickly be a first step toward reducing air pollution in Africa and thereby improving the health and quality of life for millions throughout the continent. It is one of the most cost-effective steps to protect children's health.

RESPIRATORY TOXINS

The three next most harmful pollutants from fuels which affect the respiratory system are: sulfur dioxide (SO₂) which irritates the lungs and increases the frequency of lung and bronchial infections, nitrogen oxides (NO_x) which tend to increase respiratory symptoms and decrease lung function, and suspended small particulates (SPM) less than 10µm diameter (PM₁₀), particularly the ultrafine particles less than 2.5µm diameter (PM_{2.5}), which pass through the filter of the larynx and accumulate in the lungs. These three pollutants are those produced in greatest quantities by the combustion of diesel fuel.

Recommended WHO air quality guidelines for these three pollutants are also low, as prolonged exposure to even small amounts can be harmful.

OTHER BLOOD TOXINS

WHO air quality guideline for carbon monoxide (CO) content is much higher, but CO is also produced at a much higher level when gas is burned. Although the carbon monoxide's effect can be temporary, it is potentially lethal as it replaces oxygen in the bloodstream.

Hydrocarbons (HC) consist of a mixture of pollutants and contain benzenes, which are known carcinogens and can, in high doses, damage the production of blood cells. These pollutant emissions are lower in diesel fuel than in gasoline fuel.

MOBILE SOURCES

These various pollutant emissions depend on the daily kilometers traveled, the fuel composition, the age of the vehicle fleet, and also the composition of the fleet.

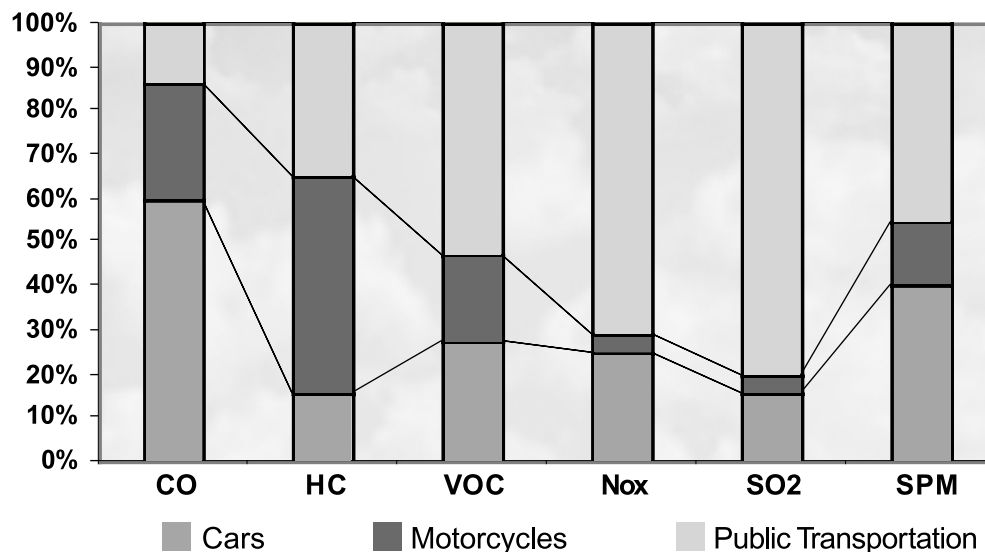
For instance, pilot studies conducted in Dakar and Ouagadougou, under the Clean Air Initiative in SSA, show that as a result of the higher use of public buses and an old fleet of private cars in Dakar, the majority of which are diesel vehicles, the emissions of NO_x, SO₂ and PM₁₀ are higher than in Ouagadougou. In contrast, in Ouagadougou, the high number of mopeds, their high usage (more daily travels), and the fuel they use (over-mixture of lubricant oil with gasoline: 8% of oil instead of 4%) result in 1.3 times more CO emissions and 6 times more HC emissions than in Dakar.

Urban air pollution patterns may vary from one city to another depending on these various factors, and pollutants need to be identified and quantified according to their potential sources.

The graph below from the 1997-1999 Bamako Case Study, which shows the simulated pollutant emission levels by type of motorized transport, illustrates the need for conducting individual city studies in order to first identify and evaluate the pollution causes for that city. Results will subsequently aid in the development of appropriate solutions.

DISTRIBUTION OF POLLUTANT EMISSIONS BY SOURCE – BAMAKO, MALI (1996)

GRAPH 3.2 Distribution (%) of the emissions by source, 1996



Source: Urban Mobility & Emissions: Towards Accurate Standards in Sub-Saharan Africa. A Research Program and Results on a Sahelian Case: The District of Bamako, Mali. Presentation by Hamdou-Rabby Wane for the Sub-Saharan African Transport Policy Program & Urban Mobility Steering Committee Seminar of Accra, Ghana, April 18-20, 2001.

Although the trends and sources of transport air pollution may somewhat vary between cities, the results are the same: health problems mostly for children and the poorest, reduction in productivity, poorer quality of life, and degradation of the environment.

URBAN AIR QUALITY CITY STUDIES & ACTION PLANS

This chapter presents the first three, already completed, city case studies conducted in Dakar, Ouagadougou and Cotonou on vehicle-related urban air pollution, and the follow-up three national seminars. All were directly funded by the Initiative. Another, already completed, comparable case study which was conducted in Abidjan, as part of a broader World Bank transport sector study, is also discussed here. A fifth city study is now underway in Douala.

A main objective of such studies is to establish various data bases on the level of motorized vehicle-related air pollution in a city, its causes, the risks to human health, and the associated costs, now and in 10 years time, in order to evaluate which mitigating measures will be the most effective in reducing this pollution. Besides providing new information, the study preparation phase provides the first opportunity for a leadership organization and partners across the spectrum of public, private and community organizations, to be contacted and involved.

DAKAR STUDY AND ACTION PLAN (1998)

DAKAR CASE STUDY

Pollutant concentrations were estimated by simulation, using as inputs only existing available data on traffic flows, population densities, and vehicles and fuel use, and as measures of criticality, the World Health Organization (WHO) norms for CO, NO_x, SO₂, and PM₁₀ (WHO has set no norm for HC).

The study also estimated the cost of damages resulting from air pollution by extrapolating from a 1997 in-depth study of the health impacts of lead and particle air pollution in Jakarta, Indonesia. Assuming that about two million residents of Dakar would be affected by these types of pollution and that each would suffer productivity losses of 30,000 CFAF, it was estimated that the total impact would be 63 billion CFAF (about USD 100 million), or about 2.7 percent of Senegal's 1996 GNP.

In Dakar, most motorized trips (86 percent) are made on small capacity buses, called *cars rapides*, owned by the private sector. About 70 percent of vehicles are more than 10 years old, with emission levels about twice as high as those less than 10 years old; diesel fuel is used by 90 percent of buses and 33 percent of personal vehicles. Because diesel fuel contains much higher levels of NO_x, SO₂, and PM₁₀ emissions than does gasoline, the overall picture that emerges is of harmful daily levels of pollutants (NO_x and SO₂) exceeding WHO norms and affecting 1.2 million people.

The study shows that pollution reduction action must focus on vehicle age (rather than vehicle type) and fuel related measures. The simulation exercises indicated that reducing average vehicle age from 14 to 10 years (for example, by blocking imports of older cars) would cut NO_x concentrations in half. Reduction of sulfur content of diesel fuel from 1 percent to 0.2 percent would have a much greater impact on SO₂ emissions, reducing daily concentrations by 90 percent so that the WHO limit is not exceeded on any road.

DAKAR NATIONAL SEMINAR

The study was widely distributed among stakeholders, who were then invited to participate in a national seminar. Participants included national and local authorities, transport operators, drivers, technicians, mechanics; NGOs and CBOs, including consumer and women's organizations. In December 1998, a national seminar on urban mobility (and encompassing urban air quality improvements) was organized in Dakar by the Dakar Executive Council for Urban Transport (CETUD), the lead agency involved in preparing a group of investments in road, bus, and rail systems for World Bank financing (Dakar Urban Mobility APL, appraised Feb-March 2000).

Numerous recommendations were debated, covering physical improvements (new ring road, street name signage, relocation of markets and commercial zones away from major thoroughfares, light rail system, sidewalks, parking, intersection improvements), financial aspects (tax incentives for less polluting vehicles and fuels, toll roads, funds for replacing old buses), regulatory measures (vehicle import limitations, emissions standards, enforcement of existing rules on roadway use), and institutional initiatives (a new unit for air quality management, a new air quality monitoring station, staggered work and school hours).

The seminar participants drew up an action plan, and concluded that the CETUD (Dakar Transport Executive Council) would be responsible for setting a time-table for follow-up.

Recently the CETUD submitted requests for the following two projects to the Nordic Development Fund:

- Technical Aid for the creation of three vehicle technical control centers.
- Technical Aid for the setup of a central laboratory to sort, store and manage urban air quality and pollution data obtained from several fixed and one mobile monitoring control stations (also included in the project).

OUAGADOUGOU STUDY AND ACTION PLAN (1999)

OUAGADOUGOU CASE STUDY

The Ouagadougou study followed the same model-based approach as the Dakar study, but added projections to 2010 and assessed the impact on future rather than current pollution. Because Ouagadougou has many wide avenues with at most three-story buildings, a different emission diffusion model, allowing for faster dispersal of emissions, was used. The other main differences with Dakar are that residents of Ouagadougou prefer to return home in the middle of the day and thus make nearly twice as many trips per day as residents of Dakar, and that the most popular form of motorized transport is mopeds; service provided by bus is very scant.

The picture that emerges is that most pollution comes from the mopeds and therefore the pollutants that dominate in Ouagadougou—CO and HC—are those that are low in Dakar and vice versa; levels of diesel-fuel pollutants are low in Ouagadougou. But CO concentrations are 50 percent higher in Ouagadougou and HC concentrations nearly 10 times higher. Nonetheless, pollutant concentrations for the base year (1996) are below the norms with minor exceptions; thus present conditions are less a matter of concern than those projected for 2005 and 2010, when concentrations are projected to be two to five times higher. Even at the projected 2010 levels, pollutant concentrations exceed WHO norms for only a small part of the road network and for only one pollutant, NO_x. Thus Ouagadougou could hold pollution levels below WHO norms, in contrast to Dakar, where significant reductions are required now.

The Ouagadougou study also estimated the cost of damages resulting from air pollution, using the same approach as the Dakar study. It was estimated that the total impact would amount to about 1.6 percent of Burkina Faso's 2000 GNP, and 3 percent in 2010, doubling in ten years.

In Ouagadougou, most motorized trips (81 percent) are made on two-wheeled taxi-motos that carry no more than one passenger. Because of the low carrying capacity of mopeds, the 1.4 million motorized trips generate over 4 million vehicle kms traveled each day. About 80 percent of vehicles are more than 10 years old and are fueled by gasoline. Low diesel fuel use means that NO_x, SO₂ and PM₁₀ emissions are much lower than in Dakar, but emissions of carbon monoxide (CO) and hydrocarbons (HC) are many times higher in Ouagadougou.

In this study, projections made up to 2010, indicate that pollution levels would be two-and a half to five times higher than today. The study estimated how much future pollution levels would be reduced by corrective measures that

would either (1) reduce vehicle emissions by reducing vehicle age, reducing the sulfur content of diesel fuel, and replacing half of two-stroke mopeds with four-stroke mopeds, (2) reduce the total vehicle kms required for a given number of trips by using buses for heavily traveled routes. Each of these approaches would reduce pollution by about the same amount, but neither alone would reduce pollution to an acceptable level. As in Dakar, an effective action plan would require a combination of measures. Moreover, in Ouagadougou, reduction of the average number of trips per day by eliminating the mid-day trip home would have a very significant impact in lowering motor-related air pollution, although the impact of this measure was not evaluated.

OUAGADOUGOU NATIONAL SEMINAR

The Burkina Faso Ministry of Transport was the local organizer of the June 1999 Ouagadougou seminar on urban transport and air quality. Findings including the case study for Ouagadougou, the role of vehicular traffic in causing air pollution, and health and environmental impacts, were presented at the seminar.

Among the many recommendations made, several being very specific, were concrete measures concerning fuel quality and use, vehicle age, maintenance and inspection, zoning for densification to reduce sprawl and trip lengths, and the elimination of the midday break at home, which would halve the number of weekday trips.

The seminar underlined the lack of awareness of air pollution dangers on the part of drivers, mechanics, and the general public and the need to publicize vehicle-related urban air pollution issues. Possibly the most critical recommendation was to speed up the creation of an Executive Council for Urban Transport in Ouagadougou (like the one created in Dakar in 1997). The Ouagadougou Urban Transport Committee and the Auto Inspection Center were given responsibility for following up on the seminar's recommendations.

The seminar's final plenary session resulted in the following **Ouagadougou Statement** urging the authorities to implement policies that would reduce air pollution in the city:

OUAGADOUGOU STATEMENT

Given the pollution generated by motorized urban transport in Ouagadougou, the concerns about the worsening of the situation by the year 2005, and the adverse impacts on health and the environment, the seminar on air pollution generated by motorized urban transport held in Ouagadougou on June 9-10, 1999, calls on the political and administrative bodies of Burkina Faso to urgently implement a policy to drastically reduce air pollution generated by motor vehicles in Ouagadougou.

The awareness of the seriousness of the situation requires a change in approach and behavior and a strong determination to take rapid action to improve, in a sustainable way, urban mobility, people's health and quality of life, and the productivity of the urban work force which is the driving force behind the country's economic and social development.

Ouagadougou, June 10, 1999.

COTONOU STUDY AND ACTION PLAN (2000)

COTONOU CASE STUDY

The Cotonou study followed the same model-based approach as the precedent studies, including estimates for 2000 and projections to 2010 as in Ouagadougou. It also has several important additions: gathering of a small number of actual air samples at selected road intersections, estimating concentrations of lead, and comparing HC concentrations to the a norm based on one of its components (benzene).

In comparison to Dakar and Ouagadougou, Cotonou has very few paved roads (about 160 kms) that carry nearly all motorized traffic, and it experiences relatively small traffic volumes variations throughout the day, with only about 15 percent difference between peak and non-peak traffic. In contrast, Dakar has two extreme peaks and Ougadougou has four.

In Cotonou, as in Ouagadougou, mopeds are the most popular form of transport and 75 percent of motorized trips are made on mopeds; there is no city bus service. About 75 percent of cars are more than 10 years old and diesel fuel is not used much.

The overall picture that emerges for Cotonou is similar to that of Ouagadougou; where current concentrations are not generally in excess of the norms, except for HC and NO_x in a few areas. So in Cotonou as in Ouagadougou, there is an opportunity to hold pollution levels generally below WHO norms. The exception is lead, which was not included in the Dakar and Ougadougou studies. In Cotonou, lead concentrations in 2000 are estimated to be six times higher than the norm on 10 percent of the network and eight times higher than the norm by 2010. In general, emissions double by 2010 and by then SO_2 levels are also projected to rise above the norm in certain places. Clearly in Cotonou, elimination of lead from gasoline is by far the most urgent and cost-effective action.

The Cotonou study also estimated the cost of damages resulting from air pollution by comparing acute respiratory illness rates in urban and rural areas of the province of Cotonou and estimating direct (medical expenses) and indirect (loss of earnings/productivity) losses due to the higher rates in the city. These damages, due to the effects of SO_2 , NO_x and PM_{10} , amount to about CFAF 600 million a year, but are dwarfed by the estimated CFAF 19 billion cost of damages from lead and PM_{10} derived by using the same approach as in the Dakar and Ouagadougou studies. These results are consistent with the simulation model results indicating that for all pollutants except lead, concentrations are generally below the WHO norms. But for lead and PM_{10} together, the CFAF 19 billion loss due to shortened life expectancy and reduced productivity is equivalent to about 1.2 percent of Benin's GNP in 2000.

The study estimated how much future pollution levels would be reduced by corrective measures that would lower vehicle emissions by (1) lowering average vehicle age, replacing two-stroke mopeds with four-stroke mopeds, reducing sulfur content of diesel fuel, and reducing lead content of leaded gas plus introducing unleaded gas, or by (2) introducing bus and tram service on main routes, and improving road network and providing separate moped lanes as per the current city transport plan.

Vehicle and fuel-related measures from the first scenario were estimated to have a significant impact on lowering lead and SO_2 concentrations and holding CO and NO_x at current levels. The bus and light rail service of the second scenario would reduce moped traffic by about 15 percent, and road and traffic improvements would significantly reduce future pollution levels overall.

Therefore, combining vehicle and fuel measures with a more robust bus and traffic investment program would have the most significant corrective effect. However any significant reduction in moped traffic would require development of employment alternatives for the large numbers of moped taxi owners thrown out of work who number about 57,000, making moped taxis the largest employer in the city.

COTONOU NATIONAL SEMINAR

In October 2000, the Benin Ministry of Environment, Housing and Urbanism organized a national seminar, in Cotonou, on urban transport and air quality. At that meeting, the issue of lead in gasoline took center stage, emerging clearly as participants' foremost concern. Because some countries in the region rely on others for production (Benin gets its gasoline from Cameroon, Ivory Coast, and Nigeria), the phasing out of leaded gasoline cannot be dealt with on a country-by-country basis, but must be tackled on a regional level. The Initiative responded to this concern by proposing a regional seminar on phasing out leaded gasoline (see next chapter).

Participants were deeply affected by the study finding of very high and rapidly increasing local lead concentrations, followed by dramatic descriptions of the irreversible impact of lead on children's IQ. The Cotonou study was the first to estimate lead concentrations based on local traffic and fuel data, thus bringing the immediacy of this issue home in a way that the Dakar and Ouagadougou studies had not. A sense of urgency developed among the participants to take action against this silent menace to the next generation's potential.

The afternoon seminars followed the Ouagadougou format, with one on technical measures relating to vehicles and fuels, and another on broader transport and urban planning measures. A third seminar focused on a problem particular to Cotonou: employment alternatives for moto-taxi owner-operators, many of whom would be put out of work by virtually any policy to reduce air pollution in Cotonou (in particular, introduction of bus and tram service).

The seminar on vehicles and fuels favored taxation and import regulation to encourage purchase of less polluting vehicles (more recent model cars, four-stroke rather than two-stroke mopeds), and use of higher quality moped motor oil. The seminar on moto-taxi employment alternatives favored training not only for jobs in agriculture, a program already underway, but for new jobs in the transport sector.

The seminar urged that the forthcoming attempt to resuscitate bus service in Cotonou reflect the lessons learned from previous failures of mass transit in the city (avoid overlapping service zones, provide frequent service, attract private investors). It also recommended that an urban plan be prepared to favor densification of urban growth, and that the Ministry of Environment, Housing and Urbanism initiate the implementation of an air quality monitoring station and laboratory. This group also emphasized the need for education and publicity about air quality issues, including training for journalists.

During the final plenary session, participants reached agreement on two priority action areas: creation of a working group led by the city of Cotonou to finalize an action plan and set up a mechanism for coordinating future work, immediate phase-out of leaded gasoline, and promotion of public transport. In particular, lead phase-out would require cooperation among a broad group of ministries—urban development, environment, transport, energy—along with private sector importers and gas station owners. Benin should also contact other non-producing neighboring countries (Burkina Faso, Mali, Niger) to explore the possibility of cooperative gasoline purchasing arrangements that would create greater leverage vis-à-vis regional producers (Nigeria, Cameroon).

ABIDJAN CASE STUDY (2001)

In Abidjan, about 70 percent of motorized trips are made by public transport; the remainder is shared equally by bus, minibus, and shared taxis. There are proportionally many more cars than in the three above cities, and very few mopeds.

Estimates of air pollution from vehicle emissions and their impacts in Abidjan were made as part of a broader study of urban transport issues, including mobility and bus and taxi use, accidents, noise, and congestion, and transport expenditures and taxes. That study was carried out in 2001 using 1998 data for the Ministry of Transport,

in the context of a World Bank Transport Sector Adjustment Program. The same simulation methodology as in the other studies was used to calculate total emissions of pollutants by mode.

However, no estimates of pollutant concentrations were made (as in the other studies, where dispersion models were used), so there is no indication of how these relate to the WHO norms. No projections were made for emissions, and the relative impacts of corrective measures were not assessed, only their costs. Therefore it is difficult to compare Abidjan with the other cities.

The cost of implementing three corrective measures was estimated: phasing out leaded gasoline, maintenance to reduce emissions of older vehicles, and lowering the age of imported vehicles.

Converting to unleaded gasoline would be highly cost-effective: with a cost of about CFAF 1 billion a year versus the cost of damage due to lead emissions between CFAF 9 and 26 billion.

Estimates for non-lead pollution improvements to be expected from the rehabilitation of older vehicles were inconclusive.

Lowering the age of imported vehicles from seven to five years (compared to current average car age of 11 years) would have a negligible impact on pollution; therefore this measure is clearly not cost-effective.

Though it provides less specific information about urban air pollution and its impacts than the above three Initiative-financed studies, what is unique about the Abidjan study is that it places the cost of damages due to vehicle-related air pollution in the overall context of other transport related "dysfunctions," such as accidents, congestion and noise. Taken together, the cost of damages due to all transport-related dysfunctions amounted to CFAF 89-143 billion, or 3 to 5 percent of the GNP. Damages due to air pollution were the highest, accounting for nearly half the total, and nearly equal to the combined cost of accidents and congestion.

DOUALA STUDY AND ACTION PLAN (2002-2003)

A fifth city study was initiated in 2002, and is still underway in Douala, Cameroon. Following its completion, a national seminar is expected to be organized in Cameroon, in 2003, to present the study findings and debate the recommendations.

A study approach and methodology to estimate air pollution, similar to those used in Dakar, Ouagadougou and Cotonou, are used in the Douala study. The Douala study, however, goes one step further by measuring pollutants in air samples using portable equipment funded by the Initiative that will be transferred to the municipality at the end of the study. The study consultant is also training a local technician to use the equipment.

PHASE-OUT OF LEADED GASOLINE IN SSA

The importance of the harmful impact of the high concentration incidence of lead emissions from vehicles upon children's health spurred the Initiative to begin immediately organizing a regional seminar on the phase-out of leaded gasoline. While the Initiative's initial strategy was country-based in order to arrive at action plans that reflected city-specific conditions, in the case of phasing out leaded gasoline, regional coordination would be required. Non-producing countries would need the cooperation of the regional producers from whom they purchased gasoline. Regional and sub-regional efforts to phase-out leaded gasoline would not replace but rather run parallel to and reinforce the Initiative's series of national studies and seminars on urban air quality.

PRODUCTION AND DISTRIBUTION OF GASOLINE IN SSA

Currently about 85 percent of all gasoline sold in the world is unleaded, leaving about 15 percent of leaded fuel, sold and used mainly in Africa, parts of Asia, and Eastern Europe. In many of these countries, there is still a poor understanding of the risks of lead exposure and confusion about the technical difficulty of eliminating leaded gasoline.

Levels of lead in gasoline sold in SSA in 1990-93 ranged from around 0.4 mg/l to twice that level, and according to an IPIECA survey, about 85 percent of gasoline sold in SSA (in 1998) was leaded. This is about on a par with Central Asia, India and Pakistan, where phase-out of leaded gasoline is also underway with a target date of 2005. In contrast, most of the gasoline in North Africa is leaded, while on the other end of the spectrum, the US, EU, and Central America are lead-free zones.

The table below provides a very brief profile of the gasoline supply in each of the five SSA sub-regions.

KEY FEATURES OF THE GASOLINE SUPPLY IN SSA

Sub-Regions In SSA	Key Features of Gasoline Supply	Key Refinery Centers
East Africa	<ul style="list-style-type: none"> Gasoline sold in sub-region has high levels of lead (0.4-0.8 g/l). Single grade of gasoline available. 	Kenya
Nigeria and Neighboring Countries	<ul style="list-style-type: none"> Nigeria produces 1/3 of total SSA gasoline output. Due to its heavy subsidizing and high quality, smuggling of Nigerian gasoline is a major source of supply in SSA and the neighboring countries. Planned lead level reduction to 0.15 g/l by the end of 2002. Single grade of gasoline available. Unleaded gasoline available at Port Harcourt refineries. 	Nigeria
Southern Africa	<ul style="list-style-type: none"> South Africa produces 1/3 of total SSA gasoline output. Unleaded gasoline available in Botswana, Mozambique, Namibia, South Africa and Zimbabwe. 	Angola, South Africa
West Africa	<ul style="list-style-type: none"> Gasoline sold in sub-region has high levels of lead (0.4-0.8 g/l), excepted for the TOR refinery of Ghana, which plans to reduce lead content to 0.14 g/l by 2002. 	Côte d'Ivoire, Ghana, Senegal
West Central Africa	<ul style="list-style-type: none"> Gasoline sold in sub-region has low levels of lead (0.20-0.60 g/l). Single grade of gasoline available. 	Cameroon, Gabon, Congo (Kinshasa)

Rapid phase-out of leaded gasoline in SSA can begin with import policy changes in countries such as Tanzania, Ethiopia, Djibouti, Mauritania, and Mozambique that import all of their gasoline as they can convert quickly. A specific intervention focusing on the phase-out of leaded gasoline in four importing countries of SSA was recently initiated under the sponsorship of ESMAP. However, major producer countries, such as Nigeria, Kenya, South Africa, must take the lead in phasing out the production of leaded gasoline.

Switchover to unleaded gasoline distribution will be hardest and most expensive in countries where only one grade of gasoline is sold, such as Nigeria and its neighbors and Central and East Africa sub-regions. Where more than one grade of gas is sold, it is easy to add an additional, unleaded grade of gasoline, particularly in countries that depend entirely on imported gasoline. Only a few countries satisfy both of these conditions. They include Niger, Mali, Mauritania, and Tanzania.

Gasoline smuggling is a major source of supply in SSA, particularly in the countries bordering on Nigeria because prices of gas in Nigeria are heavily subsidized and fuel quality is higher. In Benin, 80 percent of distribution of petroleum products is in the hands of the informal sector that is supplied mainly through smuggling.

REGIONAL/SUB-REGIONAL/NATIONAL CONFERENCES & ACTION PLANS ON THE PHASE-OUT OF LEADED GASOLINE IN SSA

The initiating of the phase-out of leaded gasoline in SSA was effectively launched at the major regional conference organized by the World Bank Clean Air Initiative in Dakar (June 2001). Soon afterwards, Nigerian participants in that conference formed The Committee on the Phase-out of Leaded Gasoline in Nigeria and organized a two-day national conference in Abuja (November 2001).

Subsequently, three sub-regional conferences have taken place to follow up this issue in the overall framework of the Initiative. The first "West Africa sub-regional conference" was held in Dakar, Senegal (March 2002), organized jointly by the Initiative and the CETUD. The second "Nigeria and Neighboring Countries sub-regional conference" took place in Cotonou, Benin (April 2002), a joint effort by the Initiative and the Benin Ministry of Environment, Housing, and Urbanism. The third "East Africa sub-regional conference" took place in Nairobi, Kenya (June 2002), a joint undertaking by the Initiative, UNEP, IPIECA and USEPA.

Proceedings are available for each of these conferences, and excerpts are also available on the World Bank website: www.worldbank.org/cleanair.

Sub-Saharan Africa Regional Conference in Dakar, Senegal (June 26-28, 2001) Launching of the Initiative for the Phase-Out of Leaded Gasoline in SSA

More than 200 participants from 25 African countries attended, representing a broad range of national and local government decision-makers, representatives from the oil and automotive industries (their first involvement in the Initiative), academic and research institutions, international organizations, NGOs, etc.

The purpose of the conference, organized by the World Bank in cooperation with the main partners of the Clean Air Initiative, was to build consensus on the regulatory, institutional, and economic issues, and on priorities to phase out leaded gasoline in SSA.

The key result of the conference was the formulation of a declaration, agreed upon by all parties that leaded gasoline will be completely phased out in all of SSA as soon as possible, and at the latest by 2005. ***The Dakar Declaration is included in the Annexes.***

The conference's other main outcomes were working plans for the five sub-regions, the initiation of a database on regional gasoline distribution in partnership with the oil industry organization IPIECA, and the planning of regional and national awareness raising events. The map, on the following page, shows these five sub-regions and the list of the included countries.

Other issues requiring further clarification were also defined:

- Choice of gasoline octane grade
- Phase-out schedules by sub-region
- Harmonization of technical specifications at the sub-regional level through sub-regional organizations
- Emission standards and inspection and monitoring mechanisms
- Design of financial incentives for consumers
- Future policies on diesel fuel

A video “Leaded Gasoline: A Silent Threat” designed for the conference in order to publicize the importance of phasing out leaded gasoline in SSA, was presented to the participants, with the intention of disseminating it further at the national and local levels among TV networks.

Nigeria National Conference in Abuja, Nigeria (November 15-16, 2001)

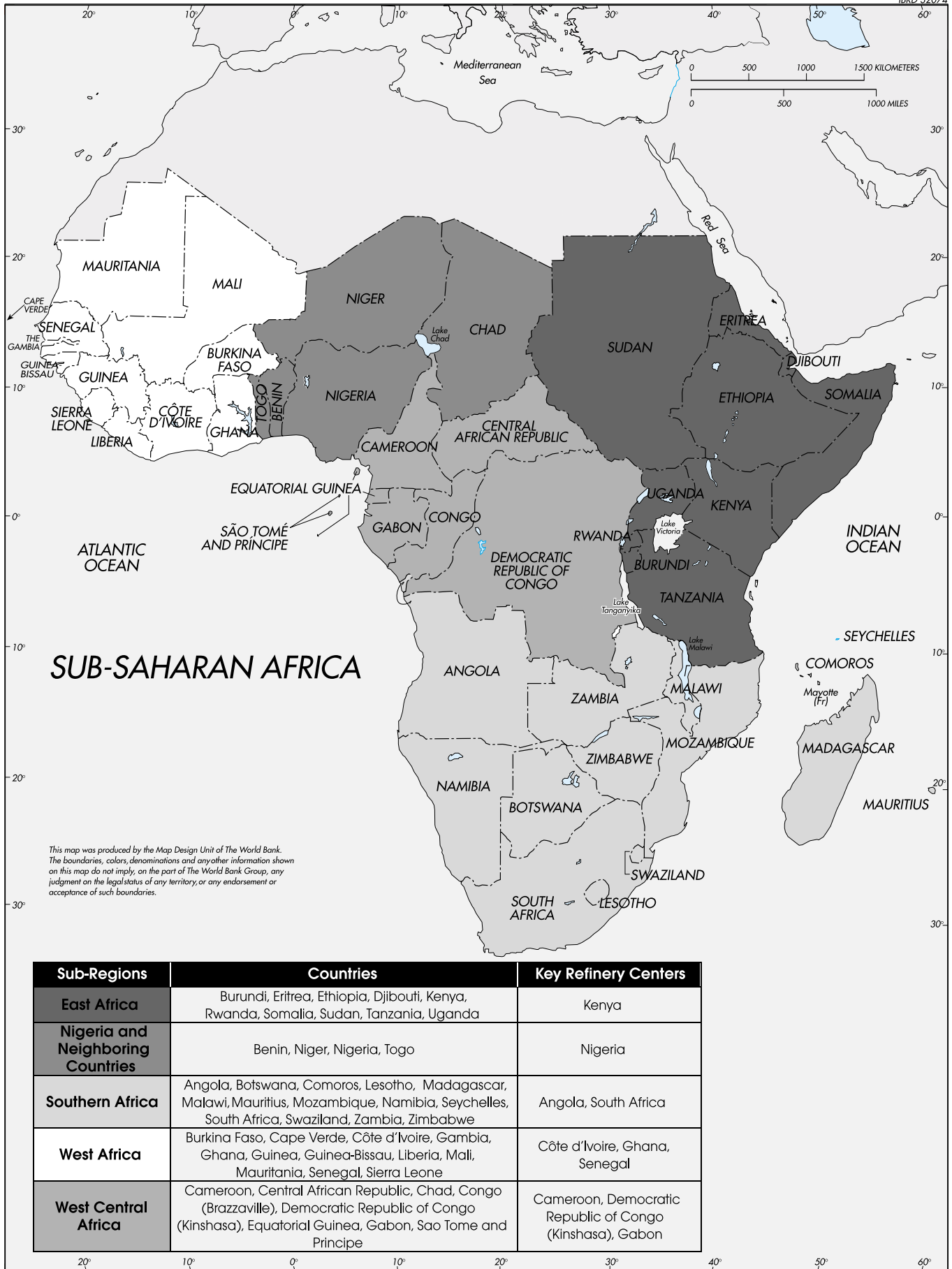
Right after the Dakar conference, Nigerian participants in that conference formed a committee composed of representatives of the federal ministries of petroleum resources, environment, transport, science and technology, and health, the National Petroleum Corporation, the National Automotive Council, the University of Ibadan, the Urban Development Bank, the Guardian newspaper, and the NGO “Friends of the Environment” to monitor the phase-out of leaded gasoline in Nigeria. The committee organized a two-day national conference in Abuja on November 15-16, 2001, that attracted participation from over 100 representatives of government at federal and state levels, the private sector, NGOs, along with UNEP and USEPA and delegates from neighboring countries. The committee had formalized an action plan which was presented at the conference and also submitted by formal memorandum for government's consideration.

Besides having a representative on the national committee for lead phase-out, the media was well represented at the Abuja conference and included producers, editors and reporters from Radio Nigeria Network, News Agency of Nigeria, Nigerian Television Authority (Channel 5, Lagos), Rivers State Television in Port Harcourt (in the heart of Nigeria's petroleum-producing region), This day newspaper, The Search newspaper, the Daily Times, the Champion newspaper, and the Federal Information Press.

The Abuja conference adopted an action plan that focuses on changing the official standards to reflect the move to unleaded gasoline, importing only unleaded gasoline, obtaining government funding of the required refinery modifications, and introduction of vehicle emission standards and testing, and requires annual reductions in lead content from the current 0.45 g/l to attain lead-free gasoline by 2004, a year earlier than the regional target date in the Dakar Declaration.

Nigeria's pledge to reach the target earlier reflects the fact that attention had been drawn to this issue as early as 1997 by the National Seminar on Vehicular Emissions and Lead Poisoning organized by Friends of the Environment, a local NGO. The phase-out of lead in gasoline produced in Nigeria was recognized as technically feasible with minimal investments, and the Nigerian National Petroleum Corporation (NNPC) had made a pledge to phase out lead in gasoline they produce by December 2002. NNPC has in fact reduced lead in gasoline to about 0.25 g/l by mid-2002 and planned to have levels down to 0.15 g/l by end 2002. The current fuel distribution system is used to distribute both leaded and unleaded fuel. Unleaded gasoline is now being produced at one of the three refineries already equipped to produce it, and the other two should be producing unleaded gasoline by 2004. Motorists using the unleaded gasoline have reported no problems with their vehicles.

A summary of the Nigeria National Action Plan is included in the Annexes.



West Africa Sub-Regional Conference in Dakar, Senegal (March 26-27, 2002)

About 70 participants from five West African countries (Senegal, Côte d'Ivoire, Burkina Faso, and Ghana, with Mauritania attending as an observer) met in Dakar, nine months after the regional launch of the phase-out of lead in gasoline, in order to review progress made in their countries and coordinate the next phase through a sub-regional action plan.

The main outcome of the meeting was that the three producers in the sub-region need to agree now on the technical specifications for a single grade unleaded fuel that they would all produce, and come up with appropriate cost estimates.

A summary of the West Africa Sub-Region Action Plan agreed upon at the conference is included in the Annexes, together with the individual action plans for Burkina Faso, Côte d'Ivoire, Ghana and Senegal.

Nigeria & Neighboring Countries Sub-Regional Conference in Cotonou, Benin (April 10-11, 2002)

Over 100 participants from Nigeria, Togo, Niger, and Benin, plus observers from the West Africa sub-regional group (Côte d'Ivoire and Senegal) gathered in Cotonou to review the progress in the Nigeria sub-region since the June 2001 Dakar meeting and move forward on a sub-regional action plan.

The sub-regional action plan adopted at this seminar set "the end of 2004" as the deadline for eliminating lead in gasoline—fully a year in advance of the Dakar Declaration date—with an interim target of 0.15g/l in 2002. The conference moderators and country presentations, however, all emphasized that lead phase-out is but one part of a broader effort to reduce air pollution from motor vehicles in cities.

While Togo and Niger as yet have no action plans, they have taken steps to get on board, with Niger's Ministry of Mines and Industry having appointed subcommittees to prepare proposals on the technical, financial, economic and fiscal aspects of lead phase-out, and its legislature having passed a law regulating hydrocarbon emissions. Togo has the farthest to go and the Togolese presentation focused on basic data on vehicle fleet and fuel storage capacity.

In their national action plans prepared in advance of the sub-regional seminar, Nigeria and Benin (but not Togo and Niger) had resolved the octane question, opting for a single grade of unleaded gas at RON 93 (less expensive to produce than the higher octane RON 95), and the sub-regional plan called on all sub-region governments to agree on this grade. The issue of contraband, storage and distribution were not explicitly addressed in the sub-regional action plan, which called on governments to officially adopt new lead standards as per the 2004 phase-out date, and to establish formal task forces to coordinate lead phase-out efforts, including information campaigns.

The action plan also emphasized the need to involve regional organizations such as UEMOA, CEDEAO and NEPAD to seek preferential tariff treatment for unleaded gas produced in the sub-region, in order to lower prices at the pump. A sub-regional working committee composed of one representative from each of the four countries was established to follow up the sub-regional action plan.

A summary of the Nigeria and Neighboring Countries Sub-Region Action Plan agreed upon at the conference is included in the Annexes, together with the individual action plans for Benin and Nigeria.

East Africa Sub-Regional Conference in Nairobi, Kenya (June 5-7, 2002)

Under the joint organization of UNEP, IPIECA, USEPA and the World Bank, about 90 participants representing governments, the private sector, and civil society met in Nairobi on June 5-7, 2002 to develop an action plan for the phase-out of leaded gasoline in East Africa. The plan begins by explicitly recognizing that lead phase-out is an essential step, but only a first step, towards a comprehensive air pollution control strategy for East African cities. The plan calls on East African governments to declare their intention to phase out leaded gasoline and work together to harmonize regional fuel specifications. Each country should designate a group to implement the phase-out, including required legislation and regulations on fuel quality and emission standards. The plan also calls on industry to support governments' efforts with sound technical information. Governments and IPIECA, representing industry, will present progress reports at a review meeting to be organized by UNEP around the end of 2003, in conjunction with the scheduled meeting of the African Ministers of Environment. UNEP will report to all East Africa partners on this meeting.

A summary of the East Africa Sub-Region Action Plan and declaration by the participants is included in the Annexes.

PROFESSIONAL NETWORKING AND TRAINING

AFRICACLEAN NETWORK LAUNCH

From the outset, the Initiative was intended to be a short-term, catalytic program that would establish a locally run network of African experts who would coordinate regional efforts to improve urban air quality and ensure exchange of regional experience.

Initiative organizers knew of African experts from the health, transport, and environment sectors with experience in air pollution issues, but there were few professional links between these experts and no regional organization where they could come together. The Initiative first brought these known experts together, and others came forward, through the process of preparing the city case studies and organizing the national and sub-regional seminars.

Further groundwork to identify an initial group of members funded by the Initiative made it possible for the regional professional association AFRICACLEAN to be formally created at the regional conference on the phase-out of leaded gasoline that was held in Dakar in June 2001.



The newly created AFRICACLEAN network includes about 80 experts from 15 African countries, with the objectives of distributing information, launching awareness campaigns, and organizing or attending other activities at the national and regional levels in order to involve more African experts and increase recognition of the multidisciplinary nature of urban air pollution issues. The first regional office is to be setup in Dakar.

AFRICACLEAN recently presented its work program to the World Bank for the potential funding of its most critical activities to be realized during the coming 2003 year. This program, included in the Annexes, consists of three components:

1. **Network Development:**

- AFRICACLEAN Descriptive Brochure.
- Membership Directory with individuals' résumé of expertise, accessible via the Web.
- Initiation and animation of "National Focal Points" in 15 countries.

2. **Establishment of National and Regional Databases:**

- To help monitor and evaluate the various elements relevant to the management of urban air pollution (economic, demographic, motorization, fuel specifications and distribution, pollutant levels, regulations, etc.).

3. **Promoting Awareness:**

- Introducing AFRICACLEAN to key regional institutions (UNEP, UEMOA, NEPAD)
- Participation at regional events
- Coordination of Media awareness

PROFESSIONAL TRAINING PROGRAMS

SSATP, MDP, SITRASS

During the years 2000 to 2002, training sessions on air pollution were provided to African technical professionals responsible for various aspects of the environment, in Abidjan (Côte d'Ivoire), Addis Ababa, (Ethiopia), Lyon (France) and Montreal (Canada).

Cotonou-Dakar-Montreal Partnership

A partnership between the cities of Montreal (Canada) and Cotonou (Benin) was finalized during the sub-regional seminar on the phase-out of leaded gasoline, held in Cotonou in October 2001. It involves training seminars for car mechanics on engines and fuels for cars and mopeds, organization of two Town Hall meetings, production of a leaflet on urban air pollution, and awareness campaigns for the many informal distributors of gasoline. The program of activities is managed in Cotonou by the Gerin Lajoie Foundation, a Canadian NGO. A similar twin partnership is being implemented between Montreal and Dakar (Senegal).

DISSEMINATION OF INFORMATION

RESEARCH & PUBLICATIONS

A list of available research papers, technical notes and studies, and conference proceedings prepared under the Clean Air initiative in SSA is included in the Annexes.

VIDEO DOCUMENTARY

An 18-minute TV documentary, "Leaded Gasoline: A Silent Threat," designed for TV broadcast throughout Sub-Saharan Africa, was produced in 2001 in time for screening in Accra, Ghana, at the April 2001 Steering Committee regional seminar for SSATP-Urban Mobility and at the June 2001 Dakar regional conference on the phase-out of leaded gasoline.

The documentary highlights the causes and sources of motorized air pollution and its effects on health, productivity, and the environment, graphically describes the impact of lead poisoning on children, and outlines measures to eliminate leaded gasoline, along with the work of the Clean Air Initiative. Using footage shot in Cotonou, Lagos, Dakar, and Antananarivo (Madagascar), combined with interviews of international lead elimination specialists, it is aimed at the general viewing public, the driving public and professional mechanics, and decision-makers in the car manufacturing and oil industries.

Five hundred videotape copies were produced (300 in English, 200 in French) and distributed to representatives of key governmental, private and media agencies. Due to its popularity, a shorter version has been recently prepared for distribution to both national and local media, and is accessible on the website of the World Bank Clean Air Initiative.

WEBSITE LINKS

The World Bank has initiated Clean Air Initiatives in four regions: Asia, Europe and Central Asia, Latin America, and Sub-Saharan Africa. The overall goal of these initiatives is the same, to advance innovative ways to improve air quality in cities by sharing knowledge and experiences through partnerships. All four initiatives use the same website: www.worldbank.org/cleanair which provides a newsletter, links to publications, online and email forums for global and regional discussions, places to post and find updated announcements and other information on air quality topics, and links to partner organization Web sites. The website section of the Sub-Saharan African Region is available in both English and French.

Another useful World Bank website to locate information on urban air pollution management programs is the SSATP-Urban Mobility website: www.worldbank.org/afr/ssatp/ut.htm.

ROAD AHEAD

(2003-2006)

While consolidating the results achieved so far in the process of eliminating lead from gasoline in the region, the Clean Air Initiative in sub-Saharan Africa will reinforce its overall effort to contribute to reducing air pollution generated by motorized transport in SSA. Such an objective will be pursued in the threefold context of fast urbanization, growing motorization and persistent urban poverty. Therefore, this effort is carried out in the spirit of the World Bank's overall urban strategy, which is primarily to make cities more livable, ensure that the poor achieve a healthful and dignified living standard, and address the environmental degradation.

Within such a framework, the following description of activities and the outputs expected to be achieved by the Clean Air Initiative in SSA will be one of the main topics of the upcoming Steering Committee Meeting scheduled for March 2003. At this stage, this work program which covers a three-year time frame period (FY04-06) has still to be discussed with the main stakeholders and therefore should be considered as a proposal.

The proposed activities are classified under six headings:

1. Phase-out of Leaded Gasoline
2. Reinforcement of Capacity Building and Awareness Campaigns
3. Launching of Research and Dissemination of Information on the Impact of Sulfur found in Diesel
4. Case Studies on Air Pollution in Selected Cities and Urban Air Quality Management Action Plan
5. Dissemination Strategy
6. The program's Management

1. PHASE-OUT OF LEADED GASOLINE

Rationale: since the 2001 Regional Conference, which officially launched the process of eliminating lead from gasoline in SSA, significant progress has been made in the design and finalization of sub-regional Action Plans to reach the 2005 goal of complete lead phase-out (see the Dakar Declaration, June 2001, in the Annexes).

With the objective of fostering the recent achievements and the consensus built with all the stakeholders involved, the main goals of the Clean Air Initiative will be to:

- Coordinate the efforts made at the sub-regional level by the five sub-region working groups, monitor the progress made, identify common achievements such as technical standards and regulatory changes, and provide complementary advisory services when appropriate;
- Improve the level of information on oil refinery conditions and overall fuel specifications in the region through a mechanism of partnership on data collection with the oil industry, the refineries, and vehicles importers/distributors;
- Promote regulatory changes and policy development, as in the importing of second hand vehicles and/or fiscal incentives for switching to unleaded gasoline, where relevant;
- Establish liaisons with regional organizations (UEMOA, ECOWAS) to foster ownership by African institutions, and facilitate regional cooperation and integration on the leaded gasoline phase-out process; help make it part of NEPAD's agenda;

- Take stock of the lessons learned from the experience of four importing countries (Mauritania, Guinea-Bissau, Ethiopia and Tanzania) to speed up the elimination of lead in other importing countries; and
- Identify “champion” countries which are ahead of the 2005 lead free time schedule; document and disseminate the reasons for success.

2. REINFORCEMENT OF CAPACITY BUILDING AND AWARENESS CAMPAIGNS

Rationale: based on the lessons learned from the achievement of its 2003 work program, AFRICACLEAN will be encouraged to take a stronger role in the program’s awareness capacities. In this respect, AFRICACLEAN might be expected to be involved in the following activities:

- Development of partnership with regional institutions anchored in SSA;
- Strengthening of local expertise in the field of urban air pollution through the use of the network as well as training programs, when appropriate;
- Public participation in the implementation of the lead phase-out plans and future air quality management plans at the national levels, including feedback from the communities on impacts of awareness programs and community support; and
- Awareness campaigns to reduce emissions from two-stroke engines by improved lubrication.

3. LAUNCHING OF RESEARCH AND DISSEMINATION OF INFORMATION ON THE IMPACT OF POLLUTION FROM DIESEL FUEL

Rationale: Sulfur dioxide (SO₂), one of the key mobile sources of pollution, emitted in direct proportion to the amount of sulfur in fuels, particularly diesel, exacerbates respiratory symptoms. In SSA, most of the motorized trips are made by public transport using diesel. The negative impact of diesel on health is now recognized as a key area of concern for urban air quality.

It is proposed to launch an in-depth cost-benefit analysis on the improvement of the quality of diesel in some of SSA refining countries. The study will also evaluate the environmental costs of refining strategies that improve refinery economics at the expense of increased emissions. A communication strategy will be developed to disseminate the findings.

4. CASE STUDIES ON AIR POLLUTION IN SELECTED CITIES AND URBAN AIR QUALITY ACTION PLAN

Rationale: The case study process will be sustained with a view to providing information on air pollution on different urban and transport schemes. It is also proposed to conduct specific studies on the impacts of urban and land use plans in two cities, and to provide support for the finalization of an Urban Air Quality Action Plan in one city:

- Air pollution case studies (Lagos; Nairobi), to be followed by national seminars;
- Study of impact of urban planning policy and land use on traffic congestion and urban air pollution in two SSA cities; and
- Support to the finalization of a detailed Urban Air Quality Management Plan in one selected city (Cotonou, Benin, might be the best candidate for such a process).

5. DISSEMINATION STRATEGY

Rationale: increased knowledge on the negative impact of urban air pollution on health and the urban economy has been one of the core purposes of the Clean Air Initiative. It is proposed to disseminate the strategy through:

- A regularly updated website providing information about the Program, its main stakeholders, links with other relevant web pages, a discussion forum, calendar of events, publications, and learning activities;
- Production and dissemination of material on the impact of diesel fuel;
- Publication of a Newsletter on a quarterly basis;
- Publication of Working Papers covering proceedings of national/regional events as well as relevant studies;
- Dissemination of best practices and lessons learned; preparation of a toolkit on air pollution in urban areas, including some key data for benchmarking; and
- Design and use of a distance learning program targeted on stakeholders in SSA. The modules of the distance learning courses will be prepared in partnership with the World Bank Institute (WBI).

6. PROGRAM'S MANAGEMENT

Rationale: although the Program will still be coordinated by a World Bank's Task force anchored within the Africa Region, efforts will be pursued to increase the leverage impact and value-added of the Program on other sectors or operations as well as stimulate African participation. This objective is expected to be carried out through the combined elements of:

- Cooperation with the World Bank Clean Air Initiative in order to integrate lessons learned from other regions on issues tackled by SSA such as maintenance of vehicles, oil specifications, handbook on impacts of mobiles sources of pollution, to mention a few;
- Building additional partnerships and networks with environmental agencies, research organizations, networks of experts, and institutional partners, including the potential setup of formal twinning arrangements with OECD cities and SSA cities;
- Reference to urban air pollution issues in the Poverty Reduction Strategy Paper (PRSP) at national level;
- Organization of a regional assessment seminar to draw the lessons learned, the impact of the Program on national and local authorities, its leverage with other operations, the institutional arrangements, and the evolution of the legislation on the urban environment. The assessment seminar (tentatively scheduled for 2004) would be prepared as an independent evaluation to be carried out by external consultants;
- Sponsorship of conferences and workshops;
- Management of the Trust Funds allocated to the Program in accordance with the fiduciary liabilities and guidelines of the World Bank;
- Publication of annual progress reports including financial management data;
- Participation and contribution to international conferences to promote the Program's objectives;
- Preparation of a strategy paper on urban mobility and air pollution in SSA including policy options and technical measures such as traffic management and vehicle inspections. The strategy paper might also take the form of a practical toolkit for professionals and policy makers in SSA; and
- Identification of an institutional sub-regional focal point which would participate in the Program's coordination from the field.

ANNEX 1

CONSTITUTIONAL CHARTER AND OPERATING GUIDELINES OF THE CLEAN AIR INITIATIVE IN SSA CITIES

CONTEXT

Under the combined impact of urban growth, increasing numbers of motor vehicles, many of which are aging and improperly maintained, and the use of low-quality fuels, as well as the lack of traffic management measures, the cities of Sub-Saharan Africa are increasingly confronted with the adverse impacts of air pollution generated by motorized transport.

Pollution is affecting the health of urban dwellers, primarily the poorest, and the overall quality of urban life. It represents an increasing threat to productivity in African cities (accounting for estimated annual losses equivalent, in the case of Dakar, for instance, to 2.6 percent of GDP, according to a study conducted in 1998).

Combating air pollution effectively means addressing the interface between transport, energy, health, and the environment. Successful policies will also rely on partnerships between the public and private sectors, the mobilization of national and regional expertise, and the promotion of sustainable mass transit policies.

In response to the urgent need for a vigorous, concerted and multisectoral approach to these issues, a partnership was initiated in 1999 between the World Bank and a number of authorities from various countries interested in this effort. This partnership has given rise to the Clean Air Initiative for Sub-Saharan African Cities (referred to hereafter as "the Initiative").

Since the Initiative was launched, air pollution studies, followed by seminars, have been conducted in Dakar, Ouagadougou, and Cotonou. Others are under way or planned in Abidjan and Douala.

As a basis for extending this partnership to other African countries, consolidating its achievements, and putting it on a stable footing as a regional program, the partners have agreed on the following operating principles.

OBJECTIVES OF THE INITIATIVE

The Initiative will focus on three complementary objectives in Sub-Saharan African cities:

1. To sensitize urban transport stakeholders to the growing danger and negative impact of air pollution created by motorized transport;
2. To identify, implement and supervise action plans to reduce the major sources of urban air pollution, with priority on the gradual elimination of leaded gasoline;
3. To develop African expertise on air pollution.

PARTNERSHIP

The Initiative's operating principle will be that of a partnership among private and public stakeholders concerned with reducing air pollution in Sub-Saharan Africa. The principal groups of partners are:

- The "Focal points" that are to be set up in African countries, bringing together the main stakeholders in each country, based on the criteria spelled out below.

- Regional institutions such as the United Nations Economic Commission for Africa and the Municipal Development Program (PDM).
- Multilateral development institutions such as the World Bank, the African Development Bank, UNEP, WHO, the European Union, and bilateral cooperation agencies.
- National or international environmental agencies such as the United States Environmental Protection Agency (USEPA) and the Global Environment Facility (GEF).
- Consultants and scientific experts on air pollution issues, with particular emphasis on African consultants and consulting firms (AFRICACLEAN).
- International groups representing users; nongovernmental associations.
- Private operators such as automobile manufacturers, fuel producers and distributors, and refineries.

COMPONENTS OF THE INITIATIVE

The objectives of the Initiative will be achieved through a combination of twelve technical, institutional, operational, and management measures, which constitute the Initiative's program of action. These measures, or "components", are:

1. A specific study for each partner city on the sources and impacts of air pollution, as well as on probable future scenarios.
2. A national seminar, following a study in each city, to lay the ground for national action plans to reduce air pollution in the city concerned.
3. Outreach, publications, and exchanges of information at the regional level.
4. Creation and updating of national and regional databases on air pollution in the targeted cities.
5. Research and development (R&D) on the greenhouse effect of air pollution ("global warming").
6. An action plan for each partner city, designed in light of its specific transportation conditions, and combining traffic management measures, automotive fleet upgrading, fuel improvements, vehicle maintenance, urban planning, and encouragement of public transit.
7. Support for the elimination of leaded gasoline in Sub-Saharan Africa.
8. Regional seminars.
9. Creation and development of a network of African expertise on pollution issues.
10. A training and capacity-building program.
11. Measures for management and coordination of the Initiative.

These components constitute the first phase of the Initiative, through 2003. The Steering Committee for the Initiative will decide, before the end of calendar year 2003, on the basis of the Coordination Unit's advice, whether to extend these components for a longer period and whether to undertake new activities or adopt additional objectives.

ORGANIZATION AND COMMUNICATION

The Initiative will be organized by and operated through the following bodies, around which its activities will be developed: a Steering Committee, Focal Points, and a Coordinating Unit.

The principal attributes of each of these bodies are described below. The fiscal year will run from one meeting of the Steering Committee to the next. In principle, these meetings are to be held once a year.

None of the bodies set up under the Initiative (Steering Committee, Focal Points) will have the legal status of body corporate. The partners themselves will retain responsibility for all and any of the activities conducted under the Initiative.

The partners in the Initiative will undertake to make available to the Initiative all national or regional information with the potential to facilitate the pursuit of its objectives.

STEERING COMMITTEE

The Steering Committee, made up of the principal partners, will debate strategic issues and provide overall guidance for the Initiative. It is not intended to substitute for the national and regional seminars, however, and will focus its attention on general policy questions. For this reason, its composition is relatively restricted.

The Steering Committee will consist of the following full members:

- One representative of each national Focal Point;
- The United Nations Economic Commission for Africa and the Municipal Development Program
- The World Bank, the African Development Bank, WHO, UNEP and the European Commission
- Cooperation agencies providing funding for the Initiative
- Two international environmental agencies
- Two representatives of the private sector
- Two representatives of user associations
- Two representatives of African consulting associations

Other individuals or institutions may be invited to attend meetings of the Steering Committee as observers or scientific advisers.

The Steering Committee will meet annually, its principal functions being:

- To review activities carried out during the previous year, as reported by the Coordination Unit and the National Committees.
- To consider all communications of a technical, institutional, or operational nature likely to contribute to the achievement of Initiative objectives.
- To discuss and adopt the action program as prepared by the Coordinating Unit for the coming year, and to decide the work schedule, with due regard to available or expected human and financial resources.
- To provide strategic direction for the Initiative.

- To approve the financial statements submitted by the Coordinating Unit for the previous year, as well as the draft budget for the coming year.
- To approve the admission of new partners to the Initiative.
- To create select scientific committees as it deems appropriate, the recommendations and conclusions from which will be discussed at the Steering Committee.

The Steering Committee, which will be chaired initially by the World Bank, will reach its decisions by consensus among the partners present. No quorum will be required. Decisions of the Steering Committee will be recorded in the Minutes of the meeting, to be drawn up and distributed by the Coordinating Unit.

NATIONAL FOCAL POINTS

Each African country involved in the Initiative will constitute a National Focal Point, the major purpose of which will be to coordinate activities at the national level. Membership of the National Focal Point will include, but not be restricted to, the Ministry of the Environment, the Ministry of Transport, the Ministry of Energy, the Municipality, and representatives of the health sector, fuel distributors, and user associations.

The National Focal Point will be chaired by the national institution best qualified to oversee the activities and pursue the objectives of the Initiative. Selection of this institution will be the exclusive responsibility of national stakeholders. The National Focal Point should be a flexible structure and have no permanent office facilities of its own. If there is a decision to the contrary, it will be the responsibility of the Steering Committee to consider the principle of and need for such an arrangement before deciding on a financial support out of the Initiative.

The Initiative may finance any costs incurred by a National Focal Point, provided they are necessary and are previously approved by the Coordinating Unit.

The principal activities of the National Focal Point will be:

- To organize and coordinate national activities, including the organization of national seminars.
- To provide administrative liaison with the Coordinating Unit on issues relating to studies, activities, training needs, identification of consultants, purchasing of hardware or software.
- To prepare or coordinate the preparation of action plans for urban air quality management, including identification and monitoring of the program for gradual elimination of leaded gasoline. Responsibility for the action plan and its implementation schedule lies with the national authorities concerned.
- To oversee establishment of the national database or to cooperate in its constitution, depending on the formula adopted for setting up this database and integrating it into the regional database.
- To facilitate the regional distribution of information relating to the Initiative as well as to studies and technical or institutional measures undertaken to mitigate air pollution.

COORDINATING UNIT

The Coordinating Unit will be provided by the World Bank, its role being:

- To coordinate activities under the Initiative in accordance with the work schedule and procedures adopted by the Steering Committee, including the regional seminars.
- To lead the way in setting up the expertise network, in consultation with the National Focal Points.

- To submit funding proposals to donors, in light of needs as determined from the planned work schedule.
- To manage trust funds established for the Initiative by donors or private partners, in a manner consistent with the rules governing trust funds managed by the World Bank.
- To convene, organize, and ensure follow-up to meetings of the Steering Committee, and to draw up the Minutes of each session.
- To promote the Initiative to potential new institutional or private partners.
- To arrange publication, in hardcopy or on the Web site, of the results of studies and research conducted under the Initiative, as well as any information relevant to management and dissemination of methods of addressing air pollution and related issues.
- To envisage, over the medium term, to set up a regional structure for coordination.

ANNEX 2

AFRICACLEAN NETWORK PROGRAM (2003)

I. AFRICACLEAN NETWORK DEVELOPMENT

- A. Creation of the Africaclean Brochure
 - Preparation of electronic files for text, photos, etc.
 - Art direction, layout & design
 - Printing and distribution

- B. Creation of the Directory of Africaclean Experts
 - Preparation of electronic files (References, Résumés, etc.)
 - Web formatting & posting

- C. Animation of National Focal Points
 - Organizing of monthly collecting of info (Regulatory updates, Research, Studies, Projects, Conferences, Seminars, Key persons, etc.) at the country levels (3 countries x 5 sub-regions = 15 countries)
 - Supervision of the information collected from the 5 sub-regions
 - Supervision & processing of collected info at the SSA regional level: preparation of Africaclean quarterly newsletter by editing committee, electronic formatting & web posting on the Africaclean website
 - Preparation of quarterly activity progress reports

II DATA BASE: COLLECTION, ANALYSIS & SUMMARY

- Review & updating of existing IPIECA questionnaires, electronic formatting for data capture & analysis
- Distribution of questionnaires in 15 selected countries (3 countries x 5 sub-regions) to the various Ministries (Economy, Energy, Transport), refineries, etc.
- Continuous follow-up & coordination of questionnaires filling at the sub-regional levels (5 sub-regions) and the SSA regional level
- Data acquisition and treatment
- Data analysis & preparation of summary report
- Review & validating of final draft by IPIECA and The World Bank
- Printing & distribution of report

III AWARENESS PROGRAM (PRELIMINARY PHASE)

- A Key Institutions (UNEP-Nairobi, UEMOA-Ouagadougou, NEPAD- Dakar)
 - Introducing of the Africaclean network and role to key institution's administrators
- B Participation at Regional & Sub-Regional Events
- C Media Awareness Coordination
 - Distribution of "shortened version" Clean Air videotapes to local medias for public viewing
 - Distribution of existing Clean Air videotapes to national medias for public viewing

ANNEX 3

FINANCIAL SUMMARY OF THE CLEAN AIR INITIATIVE IN SSA CITIES

In US Dollars

A. Source of Fund (SOF)	FY 99	FY 00	FY 01	FY 02 (Est.)	FY 03 (Est.)	FY 99-03	%
Nordic Trust Fund (NIFESSD)			\$ 76,517	\$ 97,644	\$250,000	\$ 424,161	28%
Belgian Cooperation			\$ 30,000	\$ 61,140	\$150,000	\$ 241,140	16%
ESMAP			\$ 64,828	\$ 80,313	\$ 45,000	\$ 190,141	12%
ESMAP: Lead Phase-Out in 4 Importing Countries					\$100,000	\$ 100,000	7%
World Bank	\$ 60,700	\$30,000	\$ 47,000	\$ 75,000	\$ 75,000	\$ 287,700	19%
WBI	\$ 62,700	\$30,000	\$ 54,000	\$ 7,000	\$ 7,000	\$ 160,700	10%
SSATP	\$ 53,000	\$18,000	\$ 10,500			\$ 81,500	5%
ExxonMobil: Lead Phase-out Conference, Dakar-June 2001			\$ 50,000			\$ 50,000	3%
Total	\$176,400	\$78,000	\$332,845	\$321,097	\$627,000	\$1,535,342	100%

B. Use of Fund (UOF)	FY 99	FY 00	FY 01	FY 02	FY 03	FY 99-03
Dakar Case Study	\$ 53,000					\$ 53,000
Dakar National Seminar	\$ 41,700					\$ 41,700
Ouagadougou Case Study	\$ 33,000	\$15,000				\$ 48,000
Ouagadougou National Seminar	\$ 24,675	\$15,000				\$ 24,675
Cotonou Steering Committee			\$ 40,611	\$ 22,000		\$ 15,000
Cotonou Case Study			\$ 12,000	\$ 45,000	\$ 61,000	\$ 79,000
Cotonou National Seminar		\$14,000	\$ 20,000	\$ 11,000	\$ 15,000	\$ 12,000
Abidjan Case Study						\$ 72,000
Douala Case Study						\$ 15,000
Douala National Seminar			\$ 16,000	\$ 28,000		\$ 44,000
Video on Impact of Lead			\$190,000			\$ 190,000
Dakar, SSA Regional Conference on Lead Phase-Out				\$ 25,000		\$ 25,000
Dakar, West Africa Sub-Regional Conference on Lead Phase-Out				\$ 22,000		\$ 22,000
Cotonou, Nigeria & Neighbors Sub-Regional Conference on Lead				\$ 14,000		\$ 14,000
Abuja National Seminar on Lead Phase-Out						\$ 70,091
AFRICACLEAN Setup and Work Program			\$ 7,500		\$ 62,591	\$ 70,091
Follow up of Lead Phase-Out Working Groups					\$110,000	\$ 110,000
Awareness Campaigns				\$ 9,097	\$ 26,409	\$ 35,506
Dissemination - Translations - Publications	\$ 7,025	\$10,000	\$ 7,000	\$ 32,000	\$ 37,000	\$ 93,025
Consultancy Services			\$ 14,734	\$ 38,000	\$ 50,000	\$ 102,734
Research on Sulfur in Diesel					\$ 90,000	\$ 90,000
Coordination - Management	\$ 17,000	\$24,000	\$ 25,000	\$ 75,000	\$ 75,000	\$ 216,000
Elimination of Lead in 4 Importing Countries					\$100,000	\$ 100,000
Total	\$176,400	\$78,000	\$332,845	\$321,097	\$627,000	\$1,535,342

ANNEX 4

DECLARATION OF DAKAR ON THE PHASE-OUT OF LEADED GASOLINE IN SSA

***Regional Conference on the Phase-Out of
Leaded Gasoline in Sub-Saharan Africa
Dakar, June 25-26, 2001***

Participants from 25 Sub-Saharan African countries, representing governments, industry and civil society, and from international organizations attended the Regional Conference on the Phase-Out of Leaded Gasoline (Dakar, June 26 – 28, 2001).

CONSIDERING:

- The recommendations and resolutions of WHO, WB and UNEP stating the high priority of lead phase out worldwide.
- That surveys on blood lead levels in SSA city populations show that in many cases WHO guidelines are exceeded, bringing in particular at risk children's development and intellectual performance.
- That delays to start using unleaded gasoline are precluding the introduction of vehicles equipped with catalytic converters and thus the development of urban clean air policies in growing cities of SSA.
- The support expressed by the oil industry and the NGO community in favor of a prompt government action phasing out leaded gasoline.

THE PARTICIPANTS AGREE TO:

1. Join efforts to accelerate the formulation and implementation of programs to completely phase out leaded gasoline in all SSA countries as soon as possible, latest by 2005.
2. Recommend governments to reduce the lead content in gasoline - currently 0.8 g/l in most SSA countries - to average not more than 0.4 g/l by 2002 and to an average not more than 0.2 g/l by 2003.
3. Encourage countries with independent import facilities to accelerate their respective lead phasing out programs.
4. Harmonize the gasoline norms in all sub-regional markets, in order to foster intra-regional trade and traffic; and request IPIECA, in collaboration with national and international oil companies and representatives from the automobile industry, to assist in the formulation of a complete set of fuels technical specifications.
5. Complete the sub-regional action plans within the next 12 months framing the respective national clean air programs.
6. Request the oil supply chain operators to improve their production, storage and distribution facilities in accordance with the target lead phase out frame.
7. Request WHO, UNEP, WB and bilateral environmental agencies such as USEPA to support SSA stakeholders in developing the capacity to implement the lead phase out programs within air quality management.
8. Develop an appropriate public information campaign with an active participation of NGOs community.
9. Request the WB and other international donor agencies to give a high priority to lead phase out in

economic policy dialogues with the SSA governments and to continue supporting required technical assistance programs and assisting in the financing of viable investments.

10. Request OAU and other regional organizations (ECOWAS, WAEMU, SADCC, CAEMU, etc.) to endorse the phasing out of leaded gasoline in their priority programs and to contribute to the harmonization of standards and technical specifications.

ANNEX 5

ACTION PLAN FOR THE PHASE-OUT OF LEADED GASOLINE IN THE WEST AFRICA SUB-REGION

West Africa Sub-Regional Conference of Dakar, March 26-27, 2002

The four States represented at the seminar (**Burkina Faso, Côte d'Ivoire, Ghana, and Senegal**) reviewed the progress made in defining and implementing the regulatory measures initiated by the ministries of transportation, energy, and the environment.

The three refineries represented at the seminar – **SIR in Côte d'Ivoire, SAR in Senegal, and TOR in Ghana** - reaffirmed their commitment to implementing action plans to meet the target, "unleaded gasoline by 2005." Investments must be made, however, whose costs are still to be determined, especially for the phase entailing the complete elimination of leaded gasoline.

BURKINA FASO ACTION PLAN

The Government of Burkina Faso has set up a technical committee to implement action plans to phase out leaded gasoline (CTESP).

CTESP is conceived as an administrative body made up of national experts and development partners. It has 16 members, representing the State (executive head and ministries of energy, environment, transportation, trade, health, economic affairs, and finance) and representatives of the private sector, mainly petroleum industry leaders and consumers.

The functions of CTESP are:

In general:

- To identify, set up, and monitor action plans;
- To promote awareness among transportation-sector agents of the dangers and negative impacts of leaded gasoline;

Specifically:

- To elaborate guidelines for the implementation of programs to phase out leaded gasoline in Burkina Faso;
- To organize and coordinate national activities;
- To oversee the setting up of a national database;
- To help disseminate information at the regional level;
- To provide a liaison with other clean-air efforts.

The draft joint order is now in the process of being signed, after a consensus was reached on the importance of the program by all the departments and bodies concerned.

The activities will be launched by the end of April 2002.

CÔTE D'IVOIRE ACTION PLAN

To follow up the Dakar Declaration, the Government of Côte d'Ivoire began a study with a view to standardizing specifications for regular and super gasoline.

This study takes into account other pollutants, such as SO₂ and HC + NO_x, for which the required statistical measures will be taken in connection with the pollution control program being implemented in the next two years.

In addition, in the context of the current clean-air policy, Côte d'Ivoire has proposed several draft regulations, as follows:

- A draft decree on control of air pollution from motor vehicles;
- A draft inter-ministerial order on the operation of a motor vehicle pollution control squad;
- A draft inter-ministerial order setting limits on vehicle exhaust emissions;
- A draft inter-ministerial order establishing a tax to ensure that vehicles conform to antipollution regulations.

The SIR refinery of Côte d'Ivoire is still planning to reduce the lead content of their gasoline to 0.15 g/l by 2003 and to 0 g/l by 2005.

GHANA ACTION PLAN

The Government of Ghana, in accordance with the Dakar Declaration, is formulating action plans for improving air quality and phasing out leaded gasoline on a timetable with a deadline of 2005. Effective implementation of these action plans will require the involvement of ministerial-level actors (energy, transport, health, environment, and finance), non-governmental organizations, transportation operators, vehicle dealers, the TOR refinery, petroleum marketing firms, and consumers.

- The various actions are centered, among other things, on a redefinition of technical specifications, policies for marketing petroleum products, vehicles, and catalytic converters, and taxation policy.
- A public awareness campaign has already been launched in this connection.
- The Government of Ghana plans to enlist the support of the World Health Organization, the United Nations Environment Programme, and the World Bank in building local capacities and carrying out a pilot program.
- The TOR refinery of Ghana plans to reduce lead content to less than or equal to 0.15 g/l by April 2002 and less than or equal to 0.013 g/l by June 2002. It plans to make a study to determine whether it will continue to import unleaded gasoline or make the necessary investments to produce unleaded gasoline itself.

SENEGAL ACTION PLAN

- The Government of Senegal has begun to amend existing regulations and draft new ones to take into account the Dakar Declaration.
- Accordingly, the revised Highway Code will include regulation NS 05-060, which establishes motor vehicle exhaust emission standards.
- A draft decree regulating air pollution is now under discussion in the technical committee on environmental standards of the Senegalese Standards Association. The enforcement of this decree will limit the import of outmoded second-hand vehicles.
- With regard to the technical specifications for fuels, Decree No. 2002-03 of January 10, 2002 provides that the maximum lead content in gasoline must be reduced from 0.8 g/l to 0.5 g/l. These limits will decrease to 0.15 g/l in 2003 and will be completely phased out by 2005.
- Moreover, in the context of the implementation of the Urban Mobility Improvement Project, the Government of Senegal, with the support of the World Bank and the Nordic Development Fund, plans to establish motor vehicle inspection stations.
- Other plans include setting up an air quality observatory, a central air quality control laboratory, and stations for measuring various pollutants.
- The SAR refinery of Senegal is still planning to reduce the lead content of their gasoline to 0.15 g/l by 2003 and to 0 g/l by 2005.

WEST AFRICA SUB-REGION ACTION PLAN

In order to refine the existing strategies to improve air quality in Sub-Saharan African cities by phasing out leaded gasoline, the seminar adopted the following action plan for the West Africa sub-region.

- Production of a single-grade gasoline by 2005 at the sub-regional level. Unleaded gasoline at 93 RON has been proposed. The advantage of this plan is that it obviates the need for investment in storage, transport, and distribution facilities. It would also have the advantage of eliminating fraud by substitution. Gasoline at 93 RON is relatively cheap compared to the 95 RON gasoline currently being produced by SIR and SAR.
- Definition of harmonized technical specifications to be submitted to governments in September 2002.
- Conduct a study on combining investment efforts in order to optimize them. The report is expected to be completed by October 2002.
- Harmonization of regulations by 2005 at the latest.
- Implementation of complementary measures, such as:
 - Revision of domestic taxation of fuels and taxation of vehicles to control dieselization;
 - Development of reliable databases on the basis of unified collection methods;
 - Establishment of a network for collecting and disseminating data. Each country should identify a focal point and set up a national data collection center. At the sub-regional level, the AFRICACLEAN network could serve as a collection and dissemination center.
 - Training, information, and public awareness campaigns reflecting what is being done in Ghana.

Outside the plenary session of the seminar, the AFRICACLEAN network held a general assembly, which considered a draft action plan to focus on logistics, public awareness campaigns, and capacity-building.

The seminar made it possible for concerned public and private actors in the West Africa sub-region to unite their efforts against the danger of air pollution from motor vehicles in the Sub-Saharan African cities.

The phase-out of leaded gasoline is an essential step in the strategies for improving air quality and living conditions for urban populations. Other pollutants such as sulfur in diesel must also be eliminated.

Governments have become more aware of the issue and have already started taking action in the form of specific regulations in each country.

Technical measures have also been taken by the three refineries, depending on the specific nature of each production unit.

It is time to begin harmonizing these various measures. This is one of the key points of the conclusions of the seminar. The experts should now determine the technical specifications of a single-grade fuel for the sub-region to be proposed to governments, and studies should be made to determine the nature and optimal cost of the investments needed.

A detailed action program can be elaborated as soon as the financial resources, timetables and actors have been determined.

ANNEX 6

ACTION PLAN FOR THE PHASE-OUT OF LEADED GASOLINE IN THE NIGERIA & NEIGHBORING COUNTRIES SUB-REGION

*Nigeria & Neighboring Countries Sub-Regional
Conference of Cotonou, Benin, April 11-12, 2002*

ACTION PLAN FOR THE NIGERIA & NEIGHBORING COUNTRIES SUB-REGION			
No	NIGERIA & NEIGHBORING COUNTRIES SUB-REGION ACTIONS	EXPECTED OUTCOMES	SCHEDULED DATES
1	Governments should change current standards for lead content in gasoline, reducing the content to 0.15 g/l in December 2003 and to 0 g/l by December 2004.	Refining, distribution, and use of unleaded gasoline	2002
2	Governments of sub-regional producing and importing countries should agree on an octane level of 93 RON.	Use of unleaded gasoline	2002
3	Establishment in each country of a committee for coordinating, Information, Education and Communication (IEC), and for mobilizing awareness for the need to phase out leaded gasoline.	Greater national awareness of the dangers of leaded gasoline	2002
4	Foreign affairs ministries, together with the relevant technical ministries, should set in motion procedures to harmonize standards for phasing out leaded gasoline within ECOWAS and in the context of NEPAD.	Harmonization of sub-regional laws and regulations	2002-2003
5	Governments should ensure that all new refineries are set up to produce only unleaded gasoline.	Production of high-quality fuel	2004
6	Importers of petroleum products and quality-control mechanisms should ensure that all imported fuels are unleaded.	Protection of consumers against contraband	2002
7	Research and development units should be encouraged to identify other air pollutants (CO, CO ₂ , NO _x , SO _x , arsenic) and their sources, with a view to their reduction.	Improvement of living conditions	Ongoing from 2003
8	Ministries of the environment and standardization bodies should define vehicle exhaust emission standards and elaborate a strategy for introducing catalytic converters.	Encouragement of renewal of vehicle fleet	2002-2003
9	Ministries of health, in cooperation with other relevant technical ministries, should conduct national studies to determine the lead content in the human body and make a nutritional evaluation as a basis for further research and follow-up.	Greater knowledge about the blood lead levels in populations exposed to lead pollution	2003-2005
10	Ministries of the environment and health should inquire into other sources of lead contamination (paint, water pipes, food packaging) with a view to their elimination.	Improvement of living conditions	Ongoing from 2002

ACTION PLAN FOR THE NIGERIA & NEIGHBORING COUNTRIES SUB-REGION

No	NIGERIA & NEIGHBORING COUNTRIES SUB-REGION ACTIONS	EXPECTED OUTCOMES	SCHEDULED DATES
11	Governments of countries should provide training and retraining of mechanics and garage owners.	Training of mechanics in new technologies	2003-2004
12	Governments should ensure appropriate storage and distribution facilities for unleaded gasoline in the context of quality control of consumer products.	Consumer protection against dangerous petroleum products	2002
13	Government authorities should take all necessary steps to encourage the purchase of more environmentally sound vehicles.	Encouragement of renewal of vehicle fleet	2003
14	Governments should provide preferential community tax benefits to imports of unleaded gasoline from UEMOA and ECOWAS countries.	Discovery of better sources of supply to reduce consumer cost	2003
15	Ministries of the environment should set up and maintain a network for liaison, sharing, and exchange of information and databases.	Improved information and follow-up on pollution levels in the various countries	Ongoing

ACTION PLAN FOR BENIN

The National Seminar on the Phase-out of Leaded Gasoline in Benin, jointly organized by the Ministry of the Environment, Housing, and Urban Affairs, the Ministry of Public Works and Transportation, the Ministry of Commerce, Industry, and Employment Promotion, and the Ministry of Finance and Economic Affairs, has adopted an action plan containing the essential measures for phasing out leaded gasoline.

Two types of measures are envisaged, technical or logistic, and institutional:

- Technical measures deal with all the adaptations to be made to the current storage and distribution infrastructure and those concerning the national vehicle fleet. These measures will make it possible to list and remove all constraints on the phase-out of leaded gasoline by 2005.
- The institutional measures include legislative and regulatory reforms needed in order to phase out leaded gasoline. This harmonization will also take into account current actions on the part of the West African Economic and Monetary Union.

These measures will be briefly assessed. Some, however, will be further refined during specific studies.

The purpose of the following action plan is to phase out unleaded gasoline without increasing the cost to the consumer or causing social disruption.

BENIN ACTIONS	OBJECTIVES	ACTORS	TIMETABLE
1. Building of a 3,500 m pipeline	To connect storage facilities to Cotonou Autonomous Port through specialized pipelines	SONACOP-SA	By 2004
2. Installing diaphragm floats and replacement valves for tanks	To adapt existing equipment to new product	SONACOP-SA	By 2004
3. Information, education, and communication (IEC) of consumers and informal sector leaders	To reform national petroleum product market	State, oil companies, NGOs, artists, etc.	Ongoing for three years
4. Control and sanction of fraudulent import and distribution of petroleum products	To reform national petroleum product market	State (DCCI, Customs, MISD, MDN, etc.)	Occasional
5. Training and retraining of maintenance personnel	To improve quality of maintenance services	State, NGOs, development partners	2003-2004
6. Introduction of first category of customs tariff nomenclature for unleaded gasoline	To adapt customs tariff nomenclature to the new product	MFE (DGDDI)	2003
7. Dissemination of laws and regulations on air pollution control in Benin	To protect the air and human health	- DE/DDEHU - DHAB/DDSP	06/02-30/12/02
8. Study of lead standards in Benin	To determine the authorized lead threshold in the air in Benin	Research centers (Universities...)	2003-2005
9. Adoption and enforcement of new regulations on the import of new vehicles with catalytic converters	To promote the use of unleaded gasoline	- MEHU - MTPT - MFE - MICPE	2002-2003
10. Adoption and enforcement of tax laws exempting materials used in the provision of unleaded gasoline	To promote the use of unleaded gasoline	- MEHU - MTPT - MFE - MICPE - MJLDH	2002-2003
11. Training or retraining of mechanics	To train mechanics in new technologies	- METFP - MEHU	2002-2003

BENIN ACTIONS	OBJECTIVES	ACTORS	TIMETABLE
12. Training of teachers	To train teachers in new technologies	- MEHU - METFP - Consultant	2002
13. Social mobilization meeting	To raise public awareness	-MEHU -Mini-new technologies and communication	2003-2005
14. Organization of monitoring meetings	To ensure effective use of unleaded gasoline	-MEHU -MSP -MTPT -MISD	2003-2004
15. Elaboration and implementation of IEC program on use of unleaded gasoline	To elaborate the national IEC program	-MEHU -MSP -MTPT -MFE -MICPE -Consultant	2002-2003
16. Equipment of technical and vocational trainers with appropriate materials	To equip technical and vocational trainers with appropriate materials	-MEHU -METFP -MFE	2003-2005
17. Drafting of a decree establishing the terms of reference and functions of the follow-up committee	To establish and put in operation a follow-up committee	All relevant bodies	2002
18. (a) Study of storage and distribution capacities in response to the elimination of the informal sector and subsequent growth in demand; (b) Implementation of adaptations resulting from this study	To adapt and strengthen capacities of current facilities and reorganize the logistics of distribution	-Oil companies -MICPE	2003
19. Elaboration of negotiation position for prices of petroleum products supplied by Nigeria	To seek the best terms of supply to eliminate informal sector operations	-MICPE -MFE -MEHU -MAEIA	2002
20. Study of supply/acquisition costs of petroleum products in UEMOA region	To benefit from tariff diversion	-MICPE -MFE -MEHU	2002-2003
21. Campaign to trace lead in blood and urine	To learn more about the levels of lead in populations exposed to lead pollution	-MSP -MEHU	2003-2005
22. Amendment of existing legal provisions to follow up the introduction of unleaded gasoline (laws, decrees, regulations) N.B.: Establishment of standards and sanctions for non-compliance	To amend existing legal provisions in Benin and harmonize them with those of UEMOA	-MEHU -MJLDH -MEMH	2004
23. Air quality monitoring program in main cities of Benin	To determine the state of air pollution in the main cities of Benin	MEHU	2003-2005
24. Study of the vehicle fleet and ways of adapting it to unleaded gasoline (problem of valve seat recession)	To learn more about what measures to take for vehicles requiring adaptation	-MEHU -MTPT	2003

KEY TO ABBREVIATIONS: SONACOP = Société Nationale pour la Commercialisation des Produits Pétroliers (State-owned oil company); MEHU = Ministry of Environment, Housing, and Urban Affairs; MISD = Ministry of the Interior, Security, and Decentralization; MDN = Ministry of National Defense; MFE = Ministry of Finance and Economic Affairs; DGDDI = Office of Customs and Indirect Taxes; DE/DDEHU = Office of the Environment/Departmental Office of Environment, Housing, and Urban Affairs; DHAB/DDSP = Office of Hygiene and Basic Sanitation/Departmental Office of Public Health; MTPT = Ministry of Public Works and Transportation; MICPE = Ministry of Industry, Commerce, and Employment Promotion; MJLDH = Ministry of Justice, Legislative Affairs, and Human Rights; METFP = Ministry of Technical Education and Vocational Training; MSP = Ministry of Public Health; MAELA = Ministry of Foreign Affairs and African Integration; MEMH = Ministry of Energy, Mining, and Water Resources.

ACTION PLAN FOR NIGERIA

- The Standards Organisation of Nigeria (SON) and the Nigerian National Petroleum Corporation (NNPC) should reduce the current lead content in gasoline from 0.45 g/l to 0.15 g/l in 2002 and to lead free from 2003 onwards.
- A publicity Committee to be formed by the major stakeholders to conduct public enlightenment campaigns on improved air quality.
- The Ministry of Foreign Affairs to take up the matter of the harmonization of the technical standards of gasoline in Africa with a view to endorsing lead phase-out.
- The Department of Petroleum Resources and NNPC should ensure that all new refineries are configured to produce only unleaded fuel.
- NNPC should ensure that all gasoline imported into the country would continue to be lead free.
- NNPC should endeavor to reduce the current gasoline lead content of 0.2 g/l, to 0.15 g/l by the end of the year 2002 and to zero by the year 2004.
- Government should accept and fund the refinery modifications needed to phase-out leaded gasoline.
- NNPC to consider maintaining the existing single distribution system, allowing for a few months to flush out lead when the fuel supply becomes unleaded.\
- R & D efforts aimed at proffering solutions to reducing associated sources of air pollutants like CO, CO₂, NO_x, SO_x, aldehydes and arsenic should be boosted by the appropriate agencies.
- The Federal Ministry of Environment and SON should formulate vehicle exhaust emission standards and a programme for its implementation with a definite target for the installing of catalytic converters in the exhaust of vehicles.
- Federal and States' ministries of Health should conduct a national survey of blood lead levels, combined with nutritional assessment if possible, to provide a baseline for subsequent monitoring studies.
- The Ministries of Environment and Health should address other sources of lead intake such as auto and home paints, water supply and food containers, with a view to reducing the quantities involved.

ANNEX 7

ACTION PLAN FOR THE PHASE-OUT OF LEADED GASOLINE IN THE EAST AFRICA SUB-REGION

*East Africa Sub-Regional Conference
of Nairobi, June 5-7, 2002*



Ninety-one participants representing governments, the private sector and civil society, met in Nairobi, Kenya, from 5 to 7 June 2002 to develop an action plan for the phase-out of leaded gasoline in East Africa.

CONSIDERING:

- That human exposure to lead is a major environmental health hazard which results in a broad range of serious and often irreversible health consequences, especially in children;
- That leaded fuel prevents the introduction of cleaner engines and catalytic converters which are necessary to achieve significant reductions in air pollution;

RECOGNIZING:

- That lead phase out is the essential first step to a comprehensive air pollution control strategy in East African countries;
- That by building linkages with existing and future initiatives as well as involving all the relevant stakeholders will ensure successful implementation of these strategies;
- That most countries in the East African sub-region still use only leaded gasoline;
- That the undisputed health and environmental dangers of leaded fuels are a serious and growing threat in East Africa; and
- That there is a broad consensus among government, industry and civil society partners in favor of urgently phasing out the use of leaded gasoline;

TAKING NOTE OF:

- The decision on phasing out of leaded gasoline at the UNEP Governing Council (Decision 21/6 of February 2001) and the Dakar Declaration on the phasing out of leaded gasoline in Sub-Saharan Africa (June 2001);
- The priority given to the phase out of leaded gasoline world-wide during the preparations for the World Summit on Sustainable Development (Johannesburg, August-September 2002); and
- The three sub-regional Seminars on phasing out of leaded gasoline in Sub-Saharan Africa, held in Abuja (November 2001), Dakar (March 2002) and Cotonou (April 2002).

THE PARTICIPANTS AGREE:

- That in the East Africa context, considering health, environment, technology and economic factors, options are available to remove lead from gasoline;
- That the only refinery in the sub-region is central to the phasing out of leaded gasoline in many countries in East Africa.

THE PARTICIPANTS THEREFORE RECOMMEND THAT THE FOLLOWING ACTIONS BE TAKEN URGENTLY TO PREPARE FOR AND EXECUTE THE PHASING OUT OF LEADED GASOLINE:

1. For East African Governments to declare their intention to phase out the use of lead in gasoline and to organize a group of people to work on the specific modalities for the implementation of such phase out;
2. For multi-stakeholders to convene meetings in each country to develop road maps for the phase out of leaded gasoline (including fuel specifications, pricing and taxation, and enabling activities);
3. For respective authorities of East African Governments to work towards harmonization of fuel specifications in the region to ease the introduction of unleaded gasoline and facilitate regional trade, recognizing different timeframes and needs;
4. The enactment of appropriate national legislation/ regulation to ensure more stringent fuel quality –including unleaded gasoline- and emission standards, and monitoring and enforcement of these standards;
5. The development of awareness campaigns to train and educate government officials, fuel pump operators, and service attendants, and others, to promote unleaded gasoline;
6. For industry (oil, automotive, and retailers) to declare that leaded fuel is not necessary in East Africa and to provide sound technical information and authoritative statements to government and public;
7. For Governments to remove any barriers to the provision of unleaded fuel, and for oil companies and retailers to take a leadership role in ensuring that unleaded gasoline is widely available throughout East Africa;
8. For Governments and international agencies to purchase unleaded fuel only for their own vehicle fleet consumption;
9. For civil society to encourage actions by governments and the private sector to accelerate the phase out of lead in gasoline;
10. To develop public awareness campaigns addressed to the whole population focused on key health and environmental issues and reasons for phasing out leaded gasoline;
11. To develop awareness-raising campaigns addressed to car users, auto trade, mechanics, etc., focused on vehicle performance, user benefits, etc. to dispel myths about unleaded gasoline;
12. To initiate programs to gather and generate data and information in support of the awareness campaigns (ambient air quality, emissions, lead pollution, lead blood levels, vehicle population...);
13. For the National Environment Council in Kenya, as well as similar organizations in other East African countries, to put on their agenda the phase out of leaded gasoline.

IN ORDER TO MONITOR PROGRESS IN IMPLEMENTING THIS ACTION PLAN:

- A review, organized by UNEP, will take place during the second half of 2003 (or first half of 2004) in connection with the meeting of the African Ministers of Environment (AMCEN);
- As part of this review each government will prepare a short report on progress,;
- IPIECA will prepare a report on actions taken by the private sector;
- Civil society organizations will be invited to report on activities in relation to the action plan;
- UNEP will prepare a report of this review which will be sent to all participants of the East Africa Sub-Regional Seminar.

The international organizations that have supported this seminar, IPIECA, UNEP, USEPA, and The World Bank Group, will continue to support activities for the phase out of leaded gasoline in East Africa as well as in the rest of the world.

ANNEX 8

LIST OF PUBLICATIONS OF THE CLEAN AIR INITIATIVE IN SSA CITIES

Petroleum Products in the Countries of Sub-Saharan Africa: Standardization of Specifications. *Study report by Frigo Consult, Williams G. Matthews and Henning Tandrup for the World Bank, May 1998.*

Seminar on the Urban Transport & Air Quality of Dakar in Dakar Senegal, December 17-18, 1998. *Proceedings report by SSATP & Urban Mobility, February 1999.*

Clean Air Initiative in Sub-Saharan African Cities - Work in Progress report by the Clean Air Initiative in Sub-Saharan African Cities, January 2000.

Transport Air Pollution Impact Assessment: Dakar and Ouagadougou - Two Tales of the Same Story. *Technical note by Anas Ben Barka for the World Bank Clean Air Initiative in Sub-Saharan African Cities, July 2000.*

Transport Air Pollution Generated by Motorcycles and Similar Vehicles: Lessons Learned from Dhaka, Bangladesh. *Technical note by Anas Ben Barka for the World Bank Clean Air Initiative in Sub-Saharan African Cities, July 2000.*

Introduction to the Use of Diesel Vehicles: Health Impact Assessment and Good Practices. *Technical note by Anas Ben Barka for the World Bank Clean Air Initiative in Sub-Saharan African Cities, July 2000.*

Assessment of Lead Health Effects: The Case of Sub-Saharan African Countries. *Technical note by Anas Ben Barka for the World Bank Clean Air Initiative in Sub-Saharan African Cities, August 2000.*

The Case of Three Gasoline Importing Countries: Benin, Burkina Faso and Senegal - Preliminary Investigation to Elaborate an Action Plan. *Technical note by Anas Ben Barka for the World Bank Clean Air Initiative in Sub-Saharan African Cities, August 2000.*

Study of the Urban Air Quality of Cotonou, Benin. *Synthesis report by Tractebel and Benin Consult for the SSATP & Urban Mobility in partnership with the World Bank Institute, October 2000.*

Urban Mobility & Emissions: Towards Accurate Standards in Sub-Saharan Africa. A Research Program and Results on a Sahelian Case: The District of Bamako, Mali. *Presentation by Hamdou-Rabby Wane for the Sub-Saharan African Transport Policy Program & Urban Mobility Steering Committee Seminar of Accra, Ghana, April 18-20, 2001.*

Automobile Pollution & Health. *Presentation by Dr. Amadou Diouf for the Sub-Saharan African Transport Policy Program & Urban Mobility Steering Committee Seminar of Accra, Ghana, April 18-20, 2001.*

Sub-Saharan Africa Regional Conference on the Phase-Out of Leaded Gasoline, Dakar, Senegal, June 26-28, 2001. *Proceedings report by the Clean Air Initiative in Sub-Saharan African Cities, December 2001.*

Nigeria National Conference on the Phase-Out of Leaded Gasoline, Abuja, Nigeria, November 15-16, 2001. *Proceedings report by the Clean Air Initiative in Sub-Saharan African Cities and the Committee on the Phase-out of Leaded Gasoline in Nigeria, March 2002.*

Niger & Neighbors Sub-Regional Conference on the Phase-Out of Leaded Gasoline, Cotonou, Benin, April 11-12, 2002. *Proceedings report by the Clean Air Initiative in Sub-Saharan African Cities and the Benin Ministry of Environment, Housing and Urbanism, June 2002.*

West Africa Sub-Regional Conference on the Phase-Out of Leaded Gasoline, Dakar, Senegal, March 26-27, 2002. *Proceedings report by the Clean Air Initiative in Sub-Saharan African Cities and the Executive Council of Urban Transports of Dakar (CETUD), July 2002.*

East Africa Sub-Regional Conference on the Phase-Out of Leaded Gasoline, Nairobi, Kenya, June 5-7, 2002. *Proceedings report by the Clean Air Initiative in Sub-Saharan African Cities in partnership with UNEP, IPIECA and EPA, January 2003.*

PREVIOUS WORKING PAPERS AVAILABLE FROM THE WORLD BANK ON THE CLEAN AIR INITIATIVE IN SUB-SAHARAN AFRICAN CITIES

- **Working Paper No. 1:** Clean Air Initiative in Sub-Saharan African Cities - Dakar Seminar, December 17 & 18, 1998 - Urban Transport and Air Quality in Dakar - Proceedings (SSATP and Urban Mobility, February 1999).
- **Working Paper No. 2:** Air Quality Studies in Urban Context - Dakar and Ouagadougou Cases - Final Reports (SSATP and Urban Mobility, September 1999).
- **Working Paper No. 3:** Clean Air Initiative in Sub-Saharan African Cities - Work in Progress (January 2000).
- **Working Paper No. 4:** Air Quality Study in Urban Context - Cotonou Case – Synthesis (October 2000).
- **Working Paper No. 5:** Regional Conference on the Phase-Out of Leaded Gasoline in Sub-Saharan Africa - Dakar, Senegal, June 26-28, 2001 – Proceedings (December 2001).
- **Working Paper No. 6:** National Conference on the Phase-Out of Leaded Gasoline in Nigeria - Abuja, Nigeria, November 15-16, 2001 – Proceedings (March 2002).
- **Working Paper No. 7:** Sub-Regional Conference on the Phase-Out of Leaded Gasoline in Nigeria and Neighboring Countries - Cotonou, Benin, April 11-12, 2002 – Proceedings (June 2002).
- **Working Paper No. 8:** Sub-Regional Conference on the Phase-Out of Leaded Gasoline in West Africa - Dakar, Senegal, March 26-27, 2002 – Proceedings (July 2002).
- **Working Paper No. 9:** Sub-Regional Conference on the Phase-Out of Leaded Gasoline in East Africa – Nairobi, Kenya, June 5-7, 2002 – Proceedings (January 2003).

ACKNOWLEDGEMENTS

Written by Suzanne Snell Tesh and Serge Martin

Edited by Patrick Bultynck, Chantal Reliquet and Mariana Felicio

Designed by raw sienna digital

Printed by the World Bank - GSDPG



THE WORLD BANK
WASHINGTON DC 20433 USA



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