



Public Health and Environment in the African Region

Report on the work of WHO (2008–2009)



World Health
Organization

REGIONAL OFFICE FOR

Africa

February 2010

AFRO Library Cataloguing-in-Publication Data

Public health and environment in the African Region: Report on the work of WHO (2008–2009)

Environment and Public Health

Health policy

Research

International cooperation

Africa

ISBN: 978 929 023 1585

(NLM Classification: WA 30)

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Printed by: WHO Regional Office for Africa, PO Box 6 Brazzaville, Congo
www.afro.who.int

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“The history of public health teaches us that substantial improvements in the supply of safe drinking water, in public hygiene and sanitation, and in access to clean environment, better education and safe and balanced diet and nutrition, among others, will lead to significant reduction of communicable diseases and improve the quality of life”.

Dr Luis G. Sambo,

Regional Director

WHO Regional office for Africa

At the opening of the First Interministerial Conference on Health and Environment in Africa,
Libreville, Gabon 28 August 2008.

Acknowledgements

The World Health Organization expresses its appreciation and gratitude to all governments, organizations and institutions that supported its work on public health and environment in the African Region in the period 2008–2009.

Special thanks are offered to the governments of France, Germany, Spain and the United Kingdom; and to the Rockefeller Foundation, the Bill and Melinda Gates Foundation, the Global Environment Facility and the International Development Research Centre.

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Edited by Inís Communication: www.iniscommunication.com

Report Series Concept and Design: *Tuuli Sauren*, INSPIRIT International Communications, The Sustainable Design and Promotion Group

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Acronyms and abbreviations

| | |
|--------|--|
| AIDS | acquired immunodeficiency syndrome |
| CDC | Centers for Disease Control |
| CTT | Country Task Team |
| DALY | disability-adjusted life years |
| DDT | dichlorodiphenyltrichloroethane |
| EAC | East African Community |
| EMF | electromagnetic fields |
| ECOWAS | Economic Community of West African States |
| FAO | Food and Agriculture Organization |
| GAVI | Global Alliance for Vaccine and Immunization |
| GEF | Global Environment Facility |
| GHS | Globally Harmonized System for the Classification and Labelling of Chemicals |
| GLAAS | Global Annual Assessment of Sanitation and Drinking-Water |
| GTZ | German Technical Cooperation Agency |
| HELDS | health and environment data management system |
| HELI | Health and Environment Linkages Initiative |
| HESA | Health and Environment Strategic Alliance |
| HIA | health impact assessment |
| HIV | human immunodeficiency virus |
| HWTS | household water treatment and safe storage |
| IDRC | International Development Research Centre |
| ILO | International Labour Organization |
| IRS | indoor residual spraying of insecticides |
| IWA | International Water Association |
| JMP | Joint Monitoring Programme |
| JTT | Joint Task Team |
| LDIP | Libreville Declaration Implementation Process |
| LLIN | long-lasting insecticidal nets |
| MDG | Millennium Development Goals |
| MEA | multilateral environmental agreement |
| MTSP | Medium-term Strategic Plan |
| NGO | nongovernmental organization |
| NORM | naturally occurring radioactive materials |
| NPJA | National Plan of Joint Action |
| NRU | national reference unit |
| SAICM | Strategic Approach to International Chemicals Management |
| SANA | situation analysis and needs assessment |
| UNEP | United Nations Environment Programme |
| UNICEF | United Nations Children's Fund |
| UNITAR | United Nations Institute for Training and Research |
| USA | United States of America |
| WHA | World Health Assembly |
| WHO | World Health Organization |
| WSP | Water Safety Plans |

Foreword

Over the past few years, the World Health Organization (WHO) has been producing and refining estimates of the proportion of the global burden of disease that is directly attributable to environmental risk factors. The work undertaken jointly by WHO and the United Nations Environment Programme (UNEP), under the Health and Environment Linkages Initiative (HELI) has further consolidated the evidence base built so far. The main conclusion of these assessments is that about a quarter of the global burden of disease could be reduced through available environmental health interventions and strategies.

With the effects of climate change on public health now being felt more severely than anticipated, the work of WHO on health and environment has gained greater prominence. Indeed, one of the 13 strategic objectives of the *WHO Medium-term Strategic Plan* focuses solely on the promotion of healthier environments.

The African Region can most immediately and significantly benefit from public health gains resulting from increased coverage of primary prevention interventions, especially those addressing environmental determinants of health. This presupposes the existence of coherent policy frameworks, demonstration of proven cost-effective interventions, adequate implementation strategies, and human as well as financial capacities at the country level. These key areas have been the focus of the work of WHO over the period 2008–2009. This document describes the support provided by WHO to countries in the African Region over that period.

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Summary



Democratic Republic of the Congo. Children gather water at a water point in Kibati II camp.

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About one quarter of the global disease burden and one third of that in developing countries could be reduced through available environmental health interventions and strategies. In the World Health Organization (WHO) African Region, long-standing risk factors such as lack of access to safe drinking-water, air pollution (indoor and outdoor), lack of food hygiene, poor sanitation, inadequate waste disposal, absent or unsafe disease vector control, exposure to chemicals and injuries have not yet been addressed. In addition, Africa is facing emerging environmental challenges to public health, all in the context of strained public health systems. These emerging challenges include climate change and other issues such as persistent organic pollutants, electronic waste, radiation and new occupational risks.

In order to help address the above challenges, WHO has promoted the development of a strategic health and environment agenda at the national and international levels, alongside its technical cooperation to countries in support of national programmes to reduce and/or mitigate the impacts of environmental factors on human health.

The *WHO Medium-term Strategic Plan (2008–2013)* spells out six expected WHO-wide results as the contribution of the Secretariat to the achievement of Strategic Objective 8 during the biennium 2008–2009. These expected results had a clear focus on the development of an evidence base as well as the formulation of guidance, norms and standards; the provision of technical support to Member States for the implementation of environmental interventions; the development of national environmental and occupational health policies; initiatives to tackle the root causes of disease, particularly in sectors other than health; and finally, the health sector's leadership in changing policies in other sectors. These expected results have been aligned with the strategic orientations to guide WHO action in the African Region (2005–2009), which have made the enhancement of awareness and response to key determinants of health one of the five top priorities.

During this first biennium of the MTSP, the focus of WHO's work was to develop a comprehensive policy framework for the region, to strengthen country support operations in selected priority areas, and to undertake research to improve the quality of selected interventions.

The first Interministerial Conference on Health and Environment in Africa was organized in Libreville, Gabon, 26–29 August 2008. The conference was jointly organized by WHO and the United Nations Environment Programme (UNEP), and was hosted by the Government of Gabon. The main objective of the conference was to secure political commitment for catalyzing the policy, institutional and investment changes required to reduce environmental threats to health, in support of sustainable development in the region. The conference was attended by over 300 participants including 52 country delegations, including 82 ministers and heads of delegations from both health and environment ministries. Discussions contributed critically to increase awareness among ministers of both health and the environment about the need for an integrated policy framework. It was on this basis that ministers took an unprecedented stand to commit their respective governments to 11 priority actions that formed the basis of the *Libreville Declaration on Health and Environment in Africa*. In order to support the implementation of this declaration, WHO and UNEP established a Joint Task Team to support countries in achieving a harmonized and coordinated implementation of the Libreville Declaration. It is in this context that a meeting of partners was organized in Windhoek, Namibia (25–27 February 2009) with United Nations agencies and other partners.

During this meeting, partners agreed on a roadmap and a workplan for implementation of the Libreville Declaration. Further to this, 10 countries initiated implementation with the technical and financial support of WHO and UNEP. They started the process by undertaking a situation analysis and needs assessment.

In parallel with this, WHO provided extensive technical support to countries to address key priority issues. Among the most important were adaptation to climate change, chemicals management, waste management, safety of drinking-water, radiation protection, indoor air pollution, capacity-strengthening for health impact assessment, workers health, children's environmental health, 'Healthy Settings' initiatives, and disease vector control. In addition, a number of research projects were supported, with a clear focus on improving the quality and delivery of available interventions.

1. Introduction

About one quarter of the global disease burden and one third of that in developing countries could be reduced through available environmental health interventions and strategies. In 2002, 23% (2.4 million) of all deaths in Africa were attributed to environmental risks factors¹. In the same year, 1.03 million deaths were linked to lack of access to safe drinking-water and adequate sanitation and hygiene, with an additional 550 000 deaths being attributed to poor water resource management and unsafe water environments².

In the World Health Organization (WHO) African Region, long-standing risk factors such as lack of access to safe drinking-water, air pollution (indoor and outdoor), lack of food hygiene, poor sanitation, inadequate waste disposal, absent or unsafe disease vector control, exposure to chemicals and injuries have not yet been addressed. In addition, Africa faces emerging environmental challenges to public health, all in the context of strained public health systems. These emerging challenges include climate change and other issues such as persistent organic pollutants, electronic waste, radiation and new occupational risks. Over the past two decades, policy, legislation and regulatory frameworks that address environment–health linkages have been developed. Rapid changes in lifestyles, increasing urbanization, production and energy consumption, climatic change and pressures on ecosystems result in greater negative impacts on public health and consequently increased health costs in Africa.

Throughout the region, health promotion programmes and community education for basic hygiene and sanitation are yet to achieve the desired impacts. Rampant poverty exacerbates risk-associated behaviour and attitudes by individuals. The knowledge generated on health and environment linkages also remains poorly communicated to policy-makers. The lack of awareness of existing cost-effective interventions, in conjunction with competing policy priorities as well as ineffectively built and inadequately distributed health and environment services, together hamper the achievement of related Millennium Development Goals (MDGs).

In order to address these issues, WHO has been promoting the development of a strategic health and environment agenda at the national and international levels, alongside its technical cooperation to countries in support of national programmes to reduce and/or mitigate the impacts of environmental factors on human health. This document reports on the work of WHO in the African Region on issues related to health and environment over the period 2008 to 2009.



Democratic Republic of the Congo. A child fills up a plastic jug at a water point in Kibati I camp.

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¹ Prüss-Ustén A, Corvalán C. *Preventing disease through healthy environments: towards an estimate of environmental burden of disease*. Geneva, World Health Organization, 2006.

² Prüss-Ustén A et al. *Safer water, better health: costs, benefits and sustainability of interventions to protect and promote health*. Geneva, World Health Organization, 2008.

2. The WHO policy and programmatic framework for public health and environment in the African Region



Democratic Republic of the Congo. A child splashes water from a river on his head.

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The 11th WHO General Programme of Work recognizes a number of significant gaps in the process of health improvement, particularly for the poor. These gaps have been summarized in four main areas: social justice, responsibility, implementation and knowledge.

Health determinants, particularly environmental health determinants, are one of the work areas where these gaps are most important. Hence, the *WHO Medium-term Strategic Plan (MTSP) (2008–2013)* assigns a specific strategic objective (Strategic Objective 8) to address these issues. This objective is “to promote a healthier environment, intensify primary prevention, and influence public policies in all sectors so as to address the root causes of environmental threats to health”. The MTSP also recognizes that future progress will require strong political will, integrated policies and broad participation.

Strategic Objective 8'

The MTSP spells out six expected WHO-wide results as the contribution of the Secretariat to the achievement of Strategic Objective 8. In the African Region these expected results are as follows:

- Evidence-based assessments made, and norms and guidance formulated and updated on major environmental hazards to health (e.g. poor air quality, chemical substances, electromagnetic fields, radon, poor-quality drinking-water, and waste-water reuse); technical support provided for the implementation of international environmental agreements and for monitoring progress towards achievement of the Millennium Development Goals.

- Technical support and guidance provided to Member States for the implementation of priority programmes such as water, sanitation and hygiene, chemicals management, air pollution, waste management and integrated disease vector management, including in specific settings and among vulnerable population groups.
- Technical support provided to countries to establish national health and environment strategic alliances in order to develop or update their occupational and environmental health policies and regulations, and to prepare national plans of joint action for preventive interventions, service delivery and surveillance in the context of the *Libreville Declaration on Health and Environment in Africa* (2008).
- Guidance and tools provided to countries provided in order to support the health sector to influence policies in priority sectors, assess health impacts, determine costs and benefits of policy alternatives in those sectors, and select investments in non-health sectors that improve health, the environment and safety.
- Health sector leadership enhanced for creating a healthier environment and changing policies in all sectors so as to tackle the root cause of environmental threats to health, through means such as responding to emerging and re-emerging consequences of development on environmental health, climate change, and altered patterns of consumption and production and to the damaging effect of evolving technologies.
- Evidence-based policies, strategies and recommendations developed, and technical support provided to Member States for identifying, preventing and tackling public health problems resulting from climate change.

In addition, the Regional Programme on Health and Environment makes a significant contribution to the prevention and control of malaria and other neglected tropical diseases, through the following expected results:

Under Strategic Objective 1:

- Increased access by populations at risk to essential health interventions for prevention, control, elimination and eradication of neglected diseases, including zoonotic diseases, through effective coordination and support to countries.

Under Strategic Objective 2:

- Guidelines, policy, strategy and other tools developed to scale up equitable and innovative approaches and evidence-based interventions for prevention, treatment and care for HIV/AIDS, malaria and tuberculosis, at regional and national levels.
- Improved high quality services for HIV/AIDS, tuberculosis and malaria integrated within national health care services made available through guidance provided to Member States.
- Advice provided for strengthening of research to guide policy decisions and programme implementation for the prevention and control of HIV/AIDS, tuberculosis and malaria.

The above expected results are aligned with the strategic orientations that guide WHO action in the African Region (2005–2009), which have made the enhancement of awareness and response to key determinants of health one of five top priorities. Currently, the work of WHO in the African Region on matters of health and environment is embodied in a five-year *Strategic Plan*. The plan is cross-cutting

and therefore considers all other relevant programmes within and outside disease prevention and control. The *Strategic Plan* sets the following as priority activities:

- provision of technical support to countries for implementation of the *Libreville Declaration on Health and Environment in Africa* including formation of the Health and Environment Strategic Alliance, as well as the development and implementation of national plans of joint action, and related intersectoral priority programmes;
- provision of technical support for the implementation of multisectoral priority programmes that address the root causes of environment-related ill-health;
- in collaboration with other relevant programmes, setting up and managing a network of surveillance of communicable and noncommunicable diseases that will articulate the assessment of environmental risk factors and their health-related outcomes;
- development of technical guidelines on the major areas of health and environment, including water, sanitation and hygiene, chemicals management, climate change mitigation, air pollution, and integrated disease vector management;
- supporting countries in policy formulation and developing and implementing appropriate regulatory frameworks;
- supporting improvement in management and dissemination of information on health and environment;
- advocacy resource mobilization to secure new and additional investments in order to strengthen the Health and Environment Strategic Alliance;
- monitoring and evaluation of technical norms and standards of compliance with the *Strategic Plan* and of progress towards MDGs and other relevant targets.

3. The work of WHO over the period 2008–2009



Democratic Republic of the Congo. A woman is bathing her child in a bowl.

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During this first biennium of the MTSP, the focus of WHO's work was to develop a comprehensive policy framework for the region, to strengthen country support operations in selected priority areas, and to undertake research to improve the quality of selected interventions.

3.1. Development of a policy framework and strategic agenda for addressing health and environment linkages in Africa

3.1.1. The First Interministerial Conference on Health and Environment in Africa

In 2008, Africa was the only remaining continent to develop a cohesive framework to address health and environment challenges among various sectors. The first Interministerial Conference on Health and Environment in Africa was organized in Libreville, Gabon in August 2008. The conference was jointly organized by WHO and the United Nations Environment Programme (UNEP), and was hosted by the Government of Gabon.

The main objective of the conference was to secure political commitment for catalyzing the policy, institutional and investment changes required to reduce environmental threats to health, in support of sustainable development in the region.

The specific objectives of the conference were to:

- demonstrate the importance of recognizing the interlinkages between the environment and health to achieving sustainable development;
- promote an integrated approach to policy-making in the health and environment sectors that values the services that ecosystems provide to human health;

- agree on specific actions required to leverage the needed changes in institutional arrangements and investment frameworks for mitigating environmental threats to human health.

The conference was attended by over 300 participants including: 52 country delegations (a total of 82 ministers and heads of delegations from both health and environment ministries); scientific experts; partners and donors including United Nations (UN) agencies; secretariats of binding and non-binding conventions; development banks; European countries (France and Germany); and nongovernmental organizations.

The discussions on technical and scientific issues among country and international experts served to reconfirm the extent of the health problems posed by environmental risk factors. The experts observed that unsafe water bodies, poor access to safe drinking-water, indoor and outdoor air pollution, unhygienic or unsafe food, poor sanitation, inadequate waste disposal, absent or unsafe disease vector control, exposure to chemicals and injuries were the most significant environmental risks to human health in the majority of countries in Africa. They agreed that public health within the African Region was already being severely impacted by climate change, with the major health effects attributable to variability in agricultural production and food availability leading to under-nutrition, variability in the transmission of malaria, diarrhoea and other vector-, water- and air-borne diseases, negative health impacts from water scarcity, and natural disasters such as floods and droughts. According to participants, these impacts are occurring in the context of already substantially strained health systems in the region.

It was observed that over the past 25 years, the public health sector has been striving to develop and embrace a more global, systemic and ecologically sound approach. The meeting observed that African nations must simultaneously contend with environmental health impacts, already high disease burdens, rising economic costs of environmental degradation, as well as rapid urbanization and modernization. Environment-related diseases not only impacted the poor and vulnerable but also contribute to perpetuating poverty. Although various technologies for the management of environmental risks to human health have been developed, they are not effectively and efficiently used because of a general lack of integrated policy approaches, weak institutions, insufficient technical capacities and lack of intersectoral collaboration in the region.

Although there was growing recognition among policy-makers in Africa of the close interrelation of health and environment, in many countries national health-sector policies have been developed separately from those on environment. Planning and service delivery also takes place without deliberate integration. Nevertheless, legislative and regulatory frameworks have been developed that address environment–health linkages. Instruments such as health impact assessments (HIA) provide an important decision-making tool, through which the primary prevention of diseases can be achieved by development planning and design.

Technical discussions contributed critically to increase awareness among ministers of both health and the environment about the need for an integrated policy framework. It was on this basis that ministers took an unprecedented stand to commit their respective governments to 11 priority actions that formed the basis of the *Libreville Declaration on Health and Environment in Africa* (Annex 1)

During the conference, a number of advocacy and communications activities were also developed with the following objectives:

- a) to raise awareness and understanding of the importance of health and environment linkages and their impacts on other development sectors throughout Africa;
- b) to promote a high profile promotion of health and environment issues on the African political/development agenda;
- c) to inform and influence policy- and decision-making processes and sustain interest towards the achievement of the MDGs related to health and environmental sustainability;
- d) to simplify core technical information and messages on health and environment linkages;
- e) to keep media organizations and other major stakeholders up to date with progress on the health and environment agenda, and engaging key specialized journalists in promoting the health and environment MDGs.

Various information and media-targeted materials were produced to further raise awareness of participants of the Libreville conference. This included policy briefs, facts and figures, background information and key messages on health and environment. Extensive support was also provided to the media through press releases and a dedicated information kit. Potential outreach partners in government and business, United Nations Information Centres (UNICs), journalists networks and other established communication channels were engaged.

As an integral part of the conference, a communications roundtable was organized to encourage constructive dialogue on the challenges and strategies associated with addressing health-related environmental issues in Africa. The round table focused on “Environment and Health Threats in Africa: Responding to the Challenges and Identifying Solutions”. The panellists focused on providing insight into newly-emerging issues and challenges, and providing opportunities for current and timely coverage by media organizations.

WHO also launched the report of the Health and Environment Linkages Initiative (HELI)³ during the conference. This document provides essential information, tools and guidance that will aid in the alleviation of environmental hazards to health.

3.1.2. The Libreville Declaration Implementation Process

In November 2008, the regional directors of WHO and UNEP met in Nairobi to discuss and provide guidance on the follow-up to the Libreville Conference at national and international levels. They decided to establish a WHO-UNEP Joint Task Team (JTT) to support countries in achieving a harmonized and coordinated implementation of the Libreville Declaration.

The work of the JTT focused on three main aspects: the development of an implementation framework; the development of guidelines and tools for country use; and the provision of technical assistance to support country implementation.

The JTT prepared a draft roadmap for the implementation of the Libreville Declaration. The roadmap was discussed and adopted by countries during the first meeting of partners that took place in Windhoek, Namibia in February 2009. Partners and represented countries agreed that the objectives for implementation of the Libreville Declaration during the period 2009–2010 would be to:

³ World Health Organization/United Nations Environment Programme. *Health and Environment Linkages Initiative: Managing the linkages for sustainable development. A tool for decision-makers. Synthesis report*. Geneva, World Health Organization, 2008.

- support the establishment of a Health and Environment Strategic Alliance (HESA) at both national and international levels;
- undertake a process of situation analysis and needs assessment on a country-by-country basis;
- support the development of national plans of joint action;
- facilitate the establishment of a resource mobilization mechanism to support country strategic plans;
- support the establishment of an African network for surveillance of communicable and noncommunicable diseases;
- support the organization of the Second Interministerial Conference on Health and Environment in Africa in 2010.

Partners participating in the meeting adopted the *Windhoek Statement of Partners on the Implementation of the Libreville Declaration on Health and Environment in Africa* (Annex 2). A roadmap was also agreed upon (Annex 3).

At the country level, the Libreville Declaration Implementation Process (LDIP) has three main phases:

- Phase I: Situation analysis and needs assessment (SANA);
- Phase II: Development of national plans of joint action (NPJAs);
- Phase III: Implementation, monitoring and evaluation.

Phase I:

The SANA addresses the full array of environmental health determinants, the drivers that determine their associated risk levels and the management of these risks. The SANA considers national policies and legislation, technical and institutional capacities, existing and potential intersectoral coordination mechanisms and available resources. It utilizes a standardized methodology to allow comparability of results between countries, and compilation of regional descriptions.

Countries undertaking the SANA are requested to establish a Country Task Team (CTT). These teams are multidisciplinary groups of national experts from various institutions and sectors, which are brought together to execute the elements of the SANA process under the guidance of the appropriate interministerial committees. The CTTs prepare a draft national report on the current status of environmental risk factors to human health and ecosystem integrity, and formulate proposed priorities for consideration by governments and their partners.

In 2009 a total of 10 countries (Cameroon, Congo, Ethiopia, Gabon, Ghana, Kenya, Lesotho, Madagascar, Mali and Mozambique) received financial and technical assistance from WHO to undertake their situation analysis and needs assessment. Among them, Gabon and Kenya have completed their process with a national consensus meeting of stakeholders, which agreed on the conclusions of the SANA report and adopted national priorities on health and environment.

Phase II:

NPJAs are government-approved documents that spell out specific objectives, activities, resource requirements, stakeholders and timelines for each of the 11 Libreville Declaration action points. NPJAs clearly define indicators and a framework for monitoring and evaluation. NPJAs identify actions that will be jointly carried out by specific actors from various sectors and/or institutions. Gabon and Kenya have initiated the preparation of their NPJAs.

Initial experiences in the above countries are already demonstrating the power of the Libreville Declaration and some tangible strategic outcomes are already evidenced. The LDIP has so far enabled authentic country ownership of the process by national technical experts as well as policy-makers. Indeed, an unprecedented level of enthusiastic participation in this process is being experienced among national stakeholders. As never before, an all-encompassing dialogue on health and environment linkages is taking place in these countries, both at policy and technical levels, facilitated by the SANA exercise. A strengthened intersectoral coordination on policy, regulatory, scientific and technical issues related to health and environment is being demonstrated, and national competencies and capacities in policy review and analysis, and in the scientific assessment of health and environment linkages, are being developed. Even more importantly, the establishment of national databases is building up an evidence base for identification of gaps in knowledge on health and environment linkages and for future monitoring and evaluation processes on the impact of the Libreville Declaration. Finally, a clear and joint process of identification and validation of national priorities across sectors is ensuring good policy coordination.

3.2. Technical cooperation with countries to address key priority issues

3.2.1. Adaptation to climate change

In 2008, the 61st World Health Assembly (WHA) adopted WHA Resolution 61.19 requesting the WHO Director General inter alia “to consult Member States on preparation of a work plan for scaling up WHO’s technical support to Member States for assessing and addressing the implications of climate change for health and health systems, including practical tools, methodologies and mechanisms for facilitating exchange of information and best practices, and coordination between Member States, and to present a draft work plan to the Executive Board at its 124th session.”

In July 2008, as a contribution to the *WHO Workplan on Climate Change and Health*, WHO and the World Meteorological Organization organized a regional consultation on a framework for action on “Health Protection from Climate Risks in Africa” in Dar es Salaam, United Republic of Tanzania. The resulting framework reflects the regional and national priorities of Member States as presented by representatives from meteorology and health sector authorities of participating African nations. The framework aims to implement the recommendations of the WHA resolution at the national level through development of a set of measures that are feasible, prioritized, and that build on existing programmes that already provide substantial population protection from climate-related health risks.

The consultation concluded that public health systems within the African Region were already severely impacted by climate variability. This was due to the fact that a majority of common and high-burden diseases that affect African populations are climate-sensitive and influenced by seasonal variation in weather conditions. The priority groups of climate-sensitive diseases of concern that could be further exacerbated without targeted, proactive and concerted actions included, but were not limited to: water- and food-borne diseases; malnutrition and micronutrient deficiencies; health effects of heatwaves and extreme cold conditions; respiratory, cardiopulmonary, other diseases associated with air quality, including meningitis; vector-borne diseases, particularly malaria, rift valley fever, dengue, and schistosomiasis; and direct and indirect health effects of natural disasters, such as floods, cyclones, and droughts.

In response to evidence that anthropogenic climate change and increasing variability threatened to increase vulnerability to these health conditions in Africa, participants elaborated a framework of action. This framework includes four main objectives:

- 1) To increase awareness and place public health concerns and health protection from climate variability and change at the centre of national, regional and international action on climate change.
- 2) To strengthen health systems capacities to provide protection from climate-related health risks by implementing informed adaptive strategies at local and national levels that minimize impacts of climate variability and change on population's health and integrate these strategies into national climate change adaptation plans and programmes.
- 3) To ensure that health concerns are included in development strategies in other sectors, and decision-making is adequately supported to protect and promote public health now and in the future.
- 4) To strengthen the institutional capacity of the health community to provide guidance and leadership on health protection from climate change.

The above objectives have been taken into consideration within the *WHO Workplan on Climate Change and Health*. The plan was adopted by the 124th session of the Executive Board and endorsed by the 62nd World Health Assembly in 2009. In the African Region, implementation of the framework is articulated under the Libreville Declaration. The national SANA reports represent a sound vulnerability assessment for each country and as such provide the necessary evidence base for developing national adaptation plans in the context of NPJAs.

Beyond the framework, WHO has provided technical support to countries to develop and pilot climate change adaptation plans. Kenya is one of the seven countries that are currently benefiting from the technical cooperation of WHO, within the joint WHO/UNDP global project on piloting health adaptation to climate change, financially supported by the Global Environmental Facility. The project goal is to "implement a range of strategies, policies and measures that will decrease health vulnerability to current climate variability and future climate change". Within Kenya, the project will focus on strengthening early warning systems, interagency policy action, and timely interventions to control malaria epidemics in highland areas that are now experiencing increased temperatures. The project will also share lessons across the seven participating countries, which show different kinds of health vulnerabilities to climate change. It also aims to serve as a model for future work in assessing vulnerability and enhancing health protection from climate risks in other African countries.

3.2.2. Chemicals management

a) Support for implementation of multilateral environmental agreements and collaboration with other UN agencies in chemicals management

The use of chemical substances in domestic, recreational and workplace settings is ubiquitous. In Africa, chemicals management is still not soundly implemented. This results in various human intoxications, fatalities and environmental contamination on a large scale. Although chemical substances are used in almost all workplaces, there are specific areas where their use is very high, such as in agriculture and in certain industries. In agricultural settings, hazardous pesticide formulations are often used, which tend to be cheaper than safer alternatives. Many workplaces employ the use of chemical substances in the production of goods and services. The oil industry, in particular, causes extensive environmental contamination.

A number of international instruments have been agreed upon to support developing countries in particular in the sound management of chemicals. However, in African countries, the health sector's capacity to identify and seize opportunities provided by multilateral environmental agreements (MEAs) is in general still inadequate. Important MEAs in this context are the *Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade*, the *Stockholm Convention on Persistent Organic Pollutants* and the Globally Harmonized System for the Classification and Labelling of Chemicals (GHS). The Strategic Approach to International Chemicals Management (SAICM) provides mechanisms for assisting countries in the implementation of these MEAs, however, the health sector has been slow to engage with SAICM. In order to help redress this serious shortcoming, WHO has helped selected African countries to strengthen their health sector capacities in the appropriate use of existing international instruments on chemicals management. Technical workshops were organized in Nigeria and the United Republic of Tanzania to that end.

In the United Republic of Tanzania, WHO, in collaboration with the Rotterdam Convention Secretariat organized a workshop aimed at developing national capacities of two countries (Ghana and the United Republic of Tanzania) in the implementation of the reporting process on the use of severely hazardous pesticide formulations to the Rotterdam Convention. This process enables countries to develop strategies for the improved management of hazardous chemicals or their substitution with less hazardous substances.

In Nigeria, WHO, in collaboration with the United Nations Institute for Training and Research (UNITAR) and the International Labour Organization (ILO), organized a regional workshop for the countries of Economic Community of West African States (ECOWAS). The purpose of the workshop was to develop recommendations for regional and national implementation strategies for the GHS in ECOWAS countries and to determine timelines for identified follow-up actions. The workshop helped to update the health sector participants on chemical hazards communication and the GHS. It was realized that other sectors such as agriculture, environment and labour were better informed on these processes because they had designated focal points within countries. The lack of focal points within ministries of health was resulting in the health sector being left out of many activities where it had a vital role to play. Participants recognized the important role that the health sector had to play in the safe management of chemicals and

the urgent need to engage the health sector more robustly. The workshop also considered the wider aspects of GHS and the sound management of chemicals and further developed thinking on an agenda for Africa on SAICM. Participants identified the following priority actions:

At the international level:

- filling of gaps in scientific knowledge;
- development of globally harmonized methods for chemical risk assessment;
- development of better methods to determine impacts of chemicals on health, to set priorities for action and to monitor progress with SAICM;
- building capacities of countries to deal with poisonings and chemical incidents;
- strategies directed specifically at protecting the health of children and workers;
- working to promote alternatives to highly toxic and persistent chemicals.

At the national level:

- establishment of national technical committees to coordinate all GHS implementation activities;
- provision of adequate funding through budgetary allocations by governments and financial support from business/industry, NGOs and the donor community;
- integration of chemicals management into national planning and development programmes;
- intensification of national awareness training/sensitization programmes through active participation of policy-makers, as well as media and public interest groups;
- capacity-building of all stakeholders should be strengthened for effective participation in GHS implementation;
- strengthening of Poison Control Information Centres and Chemical Emergency Response Centres.

b) Strengthening public health pesticide management

Pesticide management has received some special attention. With the support of the Bill and Melinda Gates Foundation, a project was undertaken in six countries (Cameroon, Kenya, Madagascar, Mozambique, Senegal and the United Republic of Tanzania), to strengthen pesticide management practices. The goal of this project is to reduce the health risks of pesticides through their sound management, by facilitating the establishment of national regulatory frameworks, optimization and harmonization of registration procedures, capacity-strengthening on post-registration monitoring, evaluation and control of pesticides used for public health purposes, as well as the reduction of trade in substandard pesticide products. This project also facilitates the synergies between the Food and Agriculture Organization (FAO), WHO and UNEP technical support to countries for sound management of pesticides, on the basis of a unified and coordinated strategy for guiding the responsible bodies at the national level. Project activities include:

- development of guidelines for registration and control of pesticides;
- development of standard procedures and criteria for efficacy testing, evaluation and risk assessment of pesticides used for public health purposes;

- strengthening and expansion of the WHO Pesticide Evaluation Scheme (WHOPES) global network for testing and evaluation of pesticides used for public health purposes;
- situation analysis and needs assessment leading to the development of national action plans for pesticide management;
- institutionalization of reporting systems, capacity-building for registration and post-registration activities;
- quality control of pesticides.

The six countries are now fully engaged in implementation, with Cameroon, Kenya and the United Republic of Tanzania completing the development of national action plans for sound management of pesticides.

c) Management of chemical incidents

Chemical incidents arise because of poor control over the use, recycling and disposal of chemicals in many countries. This poor control has resulted in disease outbreaks caused by environmental contamination and by the misuse of chemicals in formulated products. In some cases these outbreaks may invoke application of the International Health Regulations (2005), for example where there is the possibility of cross-border sale of a contaminated product. WHO has assisted in the management of mass lead poisoning in Senegal, diethylene glycol poisoning in Nigeria, and the investigation of an outbreak of liver disease of unknown cause in Ethiopia.

WHO has recently published the *Manual for the public health management of chemical incidents*.⁴ Copies of the manual were distributed to participants at the 7th Congress on Toxicology in Developing Countries held in South Africa in September 2009, and a one-day training session was also provided.

WHO has also continued to provide support for the strengthening of poison centres in Ghana, Senegal, South Africa and Zimbabwe particularly on the use of data management software and subscriptions to toxicological information resources. In addition, training was provided to medical and poisons centre staff in Senegal on the management of poisonings.

3.2.3. Waste management

a) Waste from health-care activities

Exposure to waste from health-care activities is a potential risk to individuals, communities and the environment if not properly managed. An estimated 20% of all waste produced by health-care activities is highly infectious. When appropriately applied, environmentally-friendly strategies can properly manage health-care waste from source to final disposal. In many countries in the WHO African Region, infectious waste from health-care activities is not adequately segregated, which increases the volume of infectious waste requiring safe treatment, increases treatment costs and poses high risks to operators, the public (in particular children and other vulnerable groups) and the environment in general when not properly treated and safely disposed of.

⁴ *Manual for the public health management of chemical incidents*. Geneva, World Health Organization, 2009.

WHO received funding from the Global Environment Facility (GEF) to demonstrate and promote best techniques and practices in Senegal for reducing health-care waste to avoid environmental release of dioxins and mercury. WHO also received funding from the Global Alliance on Vaccination and Immunization (GAVI) to support African countries in developing and implementing national action plans for the safe management of health-care waste. The project, which was initiated in 2006, has been implemented in 36 countries of the African Region. The project is focused around three main interventions:

- providing technical and financial support to develop national plans and policies on safe disposal of waste arising from immunization activities;
- providing technical and financial support to countries with policies to carry out studies on ways to improve safe management of waste from health-care activities;
- provide support to implement national plans and policies in targeted settings to demonstrate success.

Significant progress has been made at the national level in the following countries:

- Cameroon organized a health-care waste collection and destruction event during health weeks in December 2008 and 2009.
- The Republic of the Congo finalized its national action plan, developed, printed and disseminated brochures and guidelines. The country also organized a health-care waste collection event during health week in December 2008.
- Kenya completed its national assessment and developed its national action plan, endorsed by the Ministry of Public Health and Sanitation, in November 2008. The country also developed an incinerator operators' manual. The manual was used to train 180 incinerator attendants in seven provinces.
- Madagascar constructed 22 incinerators in 22 regional and district hospitals, covering 14 of the 22 regions in the country. An incinerator was built at a basic health centre in Antananarivo and staff was trained in the safe management of health-care waste. A feasibility assessment was conducted in 40 basic health centres in the region of Alaotra Magoro.
- Mali completed the development of its national action plan. It carried out a pilot study to identify selected districts for capacity-building activities. It trained more than 75 health staff from four districts on health-care management.
- Mozambique completed its assessment as well as the development of its national action plan. The country also produced national guidelines, organized training workshops and installed six new incinerators in provincial hospitals.
- Rwanda finalized its health-care waste management national plan and initiated a study in a reference hospital, four districts hospitals and eight health centres to define the type of incinerators required.
- The United Republic of Tanzania developed *National Policy Guidelines for Healthcare Waste Management* as well as *National Standards and Practices on Healthcare Waste Management*. A monitoring plan and training manuals were also prepared and disseminated.
- Uganda finalized its *National Health Care Waste Management Plan*.
- Zambia conducted a health-care waste management assessment in all nine provincial hospitals and districts, and developed a national action plan. A national Working Group on Health Care Waste Management was constituted to spear-head planned activities.

- Zimbabwe finalized its report on the assessment of health-care waste management activities and prepared its national action plan.

b) Electronic waste

Electronic waste (or e-waste) is made up of all waste containing end-of-life electrically powered components (electrical and electronic equipment). In Africa, this waste (along with specialized waste from radiation and chemicals, among others) is always disposed of in general waste sites without any particular treatment to render it safe to the environment and people. There is growing concern that e-waste is contaminating the environment and tragically affecting the lives on many people. While the extent of the problem is still to be determined, it has been noted that import of e-products almost at the end of their useful life, as well obsolete products, is on the rise in Africa. Nigeria identified e-waste as a growing problem and sought to find strategies to have it managed better. An international conference, supported by WHO, was organized to support the country in identifying potential and real problems posed by the waste and potential solution strategies. The conference identified potential hazards and risks posed by various elements within e-products and how they could be managed. WHO will further disseminate and promote the implementation of the key recommendations of the conference in other countries of the region, particularly on the assessment of the problem and the development and implementation of national action plans.

3.2.4. Access to safe drinking-water and sanitation

Ensuring access to safe drinking-water and adequate sanitation, and encouraging personal, domestic and community hygiene are vital to promoting development, poverty reduction and health. To this end, WHO has been collaborating with various stakeholders including bilateral and multilateral cooperation agencies, research institutions and nongovernmental organizations in order to develop new tools, strategies and approaches aimed at accelerating safe drinking-water and sanitation coverage in the African Region. Three major initiatives have been undertaken under the leadership of WHO: monitoring access to water supply and sanitation (in collaboration with the United Nations Children's Fund [UNICEF]); promoting household water treatment and safe storage; and promoting development and implementation of Water Safety Plans.

a) Monitoring access to drinking-water and sanitation

WHO and UNICEF have continued to collaborate on the Joint Monitoring Programme for Water Supply and Sanitation (JMP). It is the official United Nations mechanism tasked with monitoring progress towards the MDG target on drinking-water and sanitation (MDG Target 7). In fulfilling this mandate, the JMP publishes updated estimates every two years on the use of various types of drinking-water sources and sanitation facilities at the national, regional and global levels.

According to the latest JMP estimates⁵, in 2008, 60% of the total population of Sub-Saharan Africa had access to an improved drinking-water source, with a major discrepancy between urban (83%) and rural (47%) areas. The same report also shows that 31% of the population of Sub-Saharan Africa used improved sanitation facilities, again with a significant difference between urban areas (44%) and rural areas (24%). In the meantime, in North African countries such as Algeria, Morocco or Tunisia, up to 94% of the population used an improved drinking-water

⁵ *Progress on sanitation and drinking water, 2010 update*. Geneva, WHO/UNICEF, 2010.

source with a narrower discrepancy between the urban and rural areas: 99% and 84% respectively (Tunisia). Use of improved sanitation was also higher among the North African region at 89%, with as large a disparity between rural (52%) and urban (83%) as in Morocco. Countries of the WHO African Region are unlikely to achieve MDG target on safe drinking-water and sanitation, by 2015.

The JMP has published two special regional snapshots for the African Region: A snapshot of sanitation in Africa, presented in February 2008 at the Second African Conference on Sanitation and Hygiene (AfricaSan) and *A snapshot of drinking-water and sanitation in Africa*, prepared for the African Ministers' Council On Water (AMCOW) as a contribution to the June/July 2008 African Union Summit.

Over the past two years there has been a growing concern about the discrepancies between nationally-reported numbers and those reported internationally. To address these issues the JMP embarked on a number of data reconciliation meetings, workshops and country support involving national agencies in charge of water, sanitation, health and environment, statistical offices within national governments, and international partners like the Water and Sanitation Program, the International Household Survey Network and WaterAid . In 2008/2009, these workshops and country consultations involved representatives from Benin, Burkina Faso, Ethiopia, Gambia, Ghana, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Nigeria, Senegal, Sierra Leone, Zambia and Zimbabwe. The purpose of this support is to develop a common understanding of monitoring methods, explore the possibility of harmonizing monitoring approaches between the different national monitoring agencies, and establish correspondences with JMP monitoring. The objective is also to encourage greater collaboration among national agencies and between the national stakeholders and the JMP, in order to establish or improve national and global monitoring mechanisms and methodologies. This work has helped to improve understanding of the variation in national estimates produced at country level by the different national agencies, and identify areas of potential monitoring improvement to better assess status and trends of access to drinking-water and sanitation.

b) Household water treatment and safe storage

Household water treatment and safe storage interventions using low-cost technologies such as chemical or solar disinfection have proven to be among the most cost-effective interventions in the area of water, sanitation and hygiene. In 2003, WHO supported the establishment of the International Network to Promote Household Water Treatment and Safe Storage. This network aims to contribute to a significant reduction in waterborne disease especially among vulnerable populations. Since its establishment, the network has supported studies to establish the cost-effectiveness of the evidence base for household water treatment and safe storage (HWTS) and to support the scaling up of HWTS options in selected African countries. Some of the countries at the forefront of this intervention are the Democratic Republic of the Congo, Ethiopia, Ghana, Kenya and the United Republic of Tanzania.

WHO and the network organized an International Symposium on Household Water Management and the Fourth Annual Meeting of the International Network to Promote Household Water Treatment and Safe Storage in Accra, Ghana in January 2008. The meetings explored innovative strategies and practices for introducing and scaling up implementation of HWTS interventions;

technologies and practices for safe storage of drinking-water and its linkages with disease control (e.g. dengue fever); as well as strategies for creating demand for HWTS interventions (social marketing, training and education, monitoring and evaluation). At the end of this meeting, a network workplan for 2008–2015 was prepared.

In 2009, WHO and the network continued to support country-focused capacity-building workshops on HWTS, with an emphasis on integrating this intervention with wider health priorities, particularly cholera. Joint cholera/HWTS capacity-building and policy development workshops were held in the United Republic of Tanzania and the Democratic Republic of the Congo. In addition, WHO has actively explored the added-value of combining the delivery of HWTS with indoor air pollution reduction mechanisms. These initiatives took place in pilot intervention settings in Cameroon and Kenya.

The HWTS approach is now widely promoted in the African Region, adopted by an increasing number of countries. Nongovernmental organizations are instrumental in the distribution of HWTS products, mainly through social marketing, yet the objective of rationally incorporating HWTS into overall country water, sanitation and hygiene policies remains the key challenge.

c) Water Safety Plans

The WHO *Guidelines for drinking-water quality*⁶ and the International Water Association (IWA) *Bonn Charter for Safe Drinking-Water*⁷ both recommend the adoption of Water Safety Plans (WSPs) as a means to assess and manage risks throughout the water supply system from catchment to consumer.

While the WSP approach to management of drinking-water quality has been actively taken up and successfully implemented in developed countries, the same cannot be said concerning many developing countries, especially in sub-Saharan Africa. Even where the approach has been initiated there is no readily available data to demonstrate how far countries have progressed with the process.

A need was identified to provide focused support for WSPs in developing countries, in particular, where impacts on health gains and poverty reduction would be greatest. An assessment was undertaken to identify the current status of WSP implementation in the region, specifically in Kenya, South Africa, Uganda and the United Republic of Tanzania. The overall objective of the assessment was to determine the progress made and future prospects for the widespread application of WSPs with regard to policy development, practical implementation and research to identify key stakeholders involved in these countries, and to make recommendations for the next steps for scaling up of the process.

The assessment concluded that there was a general lack of technical capacity in the region (with the exception of South Africa), to develop and implement WSPs. In some countries, policy-makers and practitioners were unaware of the WHO *Guidelines for drinking-water quality*. The WSP concept was completely new to the water sector and to policy-makers in most countries. More importantly in east African countries there were no clear regulations on the procedures to be implemented in the event of unmet water safety standards by suppliers.

⁶ *Guidelines for drinking-water quality. Third Edition.* Geneva, World Health Organization, 2004.

⁷ *The Bonn Charter for Safe Drinking-Water. European Position. Document E13-DWD/050922-02/F.* Brussels, European Union of National Associations of Water Suppliers and Waste Water Services (EUREAU), 2005.

Finally, it was found that ministries of health were only actively involved in water quality surveillance when there was a water-related disease outbreak.

WHO will continue to support capacity development for WSPs, particularly support for water quality regulators and, indirectly, support to water suppliers through organizations like IWA. A WSP manual, *Step-by-step risk management for water suppliers* was published by WHO and disseminated to African countries in 2009. French and Portuguese versions will be made available soon.

d) Global Annual Assessment of Sanitation and Drinking-Water

In 2008, on behalf of UN-Water, WHO published the Global Annual Assessment of Sanitation and Drinking-Water (GLAAS) pilot report aimed at taking a comprehensive overview of the determining factors that are constraining or enabling progress towards meeting the MDG targets for drinking-water and sanitation. For example, GLAAS looks at the resources available to the sector (e.g. as per the *eThekwinini Declaration*⁸). From the African Region, Ghana, Madagascar and Uganda participated in the pilot.

A major lesson learnt from the feedback received from donors and recipient countries is that the sanitation and drinking-water sector lacks a global periodic comprehensive sector analysis, which informs and influences high-level policy-makers. This is a major reason why the sector is not assigned high enough priority by donor and recipient governments alike. The pilot report is now being taken forward with the first UN-Water GLAAS report, due for publication at the end of March 2010. From the African Region, around 15 countries are participating in the 2010 report.

GLAAS is also a resource for the Sanitation and Water for All: A Global Framework for Action political initiative. In particular, the GLAAS findings are used as a basis for the strategic discussions that will take place at the first global high-level meeting in April 2010, which will be hosted by UNICEF in Washington DC during the World Bank's Spring Meetings.

Leading the GLAAS effort, WHO is working in collaboration with other UN-family agencies, such as UNICEF and the Water and Sanitation Program. Within WHO, the synergy between the activities for GLAAS and the Libreville Declaration is currently being explored (e.g. GLAAS survey and Libreville Declaration SANA in Ethiopia).

3.2.5. Workers' health

The good health of workers is a prerequisite for economic development. Hazardous working conditions and the resulting injuries, diseases and disability perpetuate poverty. Furthermore, the 2008 report of the WHO Commission on Social Determinants of Health⁹ highlighted the linkages

between ill-health and unemployment, precarious work and child labour. Globalization provides both challenges and opportunities to protecting and promoting the health of workers. Weak standards for health protection in some countries attract hazardous technologies, materials and production processes, for example inadequate processing of electronic waste. However, increased economic cooperation may also bring new solutions and good practices to developing countries.

⁸ Africasan. *The eThekwinini Declaration and AfricaSan Action Plan*. 2nd African Conference on Sanitation and Hygiene, 2008 (<http://www.wsp.org/UserFiles/file/eThekwininiAfricaSan.pdf>, accessed 17 March 2010).

⁹ *Commission on Social Determinants of Health. Final report*. Geneva, World Health Organization, 2008.

The world health report 2002,¹⁰ showed that the disease burden from selected occupational risks amounts to 1.5% of the global burden in terms of disability-adjusted life years (DALYs); in the WHO Africa Region this burden could be much higher. It is estimated that annually at least 43 000 people die in Africa from diseases and injuries associated with hazardous working conditions, particularly accidents and airborne particulates. Silicosis, often in combination with active tuberculosis and human immunodeficiency virus (HIV) infection is a common condition in many mining communities throughout Africa. A number of workplaces, particularly in forestry and agriculture also contribute to the incidence of malaria.

In 2008, WHO started the implementation of a ten-year global plan of action on workers' health that was endorsed by the 60th World Health Assembly. The plan addresses all aspects of workers' health, including primary prevention of occupational hazards, protection and promotion of health at work, employment conditions, and improving the response of health systems to workers' health. In such a way, it links occupational health to public health. The priorities for WHO's global action on workers' health are: (1) devising and implementing policy instruments on workers' health; (2) protecting and promoting health at the workplace; (3) improving the performance of and access to occupational health services; (4) providing and communicating evidence for action and practice; and (5) incorporating workers' health into other policies. The plan of action is intended to guide the Member States and WHO in their activities on workers' health over the period 2008–2017. It is expected that it will stimulate the development of policies, infrastructure, technologies and partnerships for improving the health of all workers, and will contribute towards achieving a basic level of health protection in all workplaces.

In 2008–2009 WHO worked with countries to review the national situations in relation to the global plan of action. In the African Region, 22 countries took part in this review by completing national questionnaires. Half of those countries reported having a national policy instrument to manage workers' health. In general, the capacities of ministries of health to provide governance for workers' health need to be strengthened, particularly with regard to setting standards, workplace health promotion, monitoring trends, coordination of health programmes, intersectoral collaboration and partnerships. Very few respondent countries have national programmes to address occupational diseases, though respiratory diseases, musculoskeletal disorders, skin diseases and poisonings are at the top of most priority lists. Less than half of the respondent countries have a national programme for protection of health and safety of health-care workers and half of the countries have full or partial requirements for immunization of health-care workers against hepatitis B. In the majority of respondent countries, less than 15% of workers have access to occupational health services, the main reason for which is the shortage of human resources dedicated to occupational health. Most countries do not have a national centre of excellence or institute with sufficient capacity in occupational health. The policies for development, poverty reduction and employment in about one third of respondent countries include some elements on workers' health and half of the respondent countries have considered workers' health aspects of chemicals and environmental management.

Furthermore, WHO has been providing technical support to selected countries to undertake their situation analysis in view of developing or updating national policies and action plans on occupational health. In the African Region, these countries include Benin, Cameroon, Comoros, Eritrea, Gambia, Madagascar, Mauritius, Namibia, the island of St Helena and Swaziland.

¹⁰ *The world health report – Reducing risks, promoting healthy life*. Geneva, World Health Organization, 2002.

3.2.6. Children's environmental health

Protecting children's health from environmental threats is crucial in Africa since children are especially vulnerable because they are still growing and developing. Concerned by the environmental risks to the health of children in Africa, WHO initiated a concerted programme of action to identify and address the priority concerns of children's environmental health in the African Region. A systematic process of assessing children's environmental health indicators and the preparation of corresponding country profiles was initiated to provide a basis for formulation of national action plans. This work continued with additional assessments in Gabon and Uganda, bringing the number of countries that have undertaken assessments to 16. In order to help policy-makers and the public better understand this issue, WHO drafted a report *How is children's health linked to the environment? Information and resources for action in Africa*.

WHO developed children's educational materials, including an information tool kit. The tool kit contains games and educational activities that help teachers and care providers educate school children about the main environmental hazards to health and about some steps that can be taken to improve the environment and health. Selected sections of the tool kit address accidents and injuries, chemicals and poisons, food safety, indoor air pollution and water safety. The tool kit has been tested in South Africa where it was shown to be very user-friendly, effective and appreciated in schools. The report describing the findings of the field tests concludes that the tool kit was extremely well received by the teachers, and that it is appropriate and will serve as a useful vehicle to improve knowledge of environmental health hazards among primary school children. It is now being widely disseminated in South Africa and four additional countries have initiated its testing: Kenya, Uganda, Zambia and Zimbabwe.

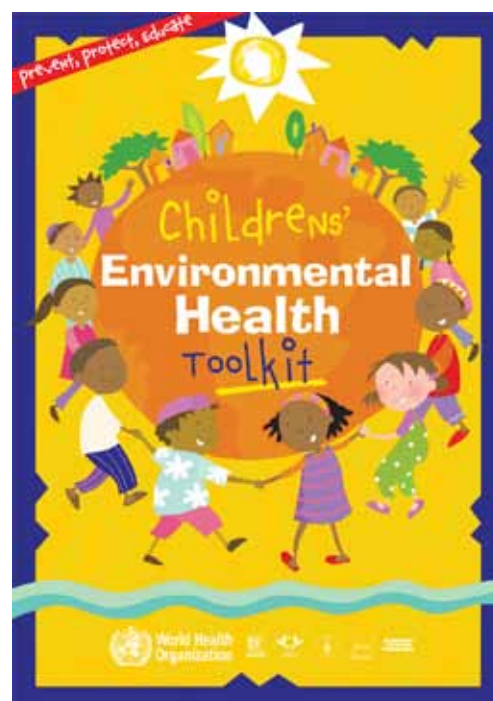


Figure 1. Children's environmental health toolkit cover page

3.2.7. 'Healthy Settings' initiatives

WHO has been promoting 'Healthy Settings' initiatives in the African Region. This is an integrated public health strategy aimed at preventing diseases and improving quality of life in places where people live and work. Experience and evidence collected globally shows that promoting health in settings such as villages, schools, workplaces, cities, municipalities and communities improves the health status of the people and quality of life in those places. A number of healthy settings initiatives have been undertaken and implemented throughout the region over the past 10 years. There was a need for experience-sharing among stakeholders and partners on these initiatives in order to boost their revival. WHO convened a meeting for 16 French- and Portuguese-speaking countries in August 2008 in Libreville, Gabon, with the objective of reviewing progress in developing 'Healthy Cities' initiatives in countries since 1999 and to outline future work in promoting the 'Healthy Settings' approach in the region. A total of 45 participants attended the meeting, in addition to



Figure 2. Children working with an accidents and injury poster

the two experts from WHO Collaborating Centres for Francophone healthy cities, namely Quebec and Geneva. WHO was requested to continue to play its role of supporting Member States in establishing and strengthening 'Healthy Settings' activities in a number of ways including by:

- promoting the concept through meetings and among high level decision-makers;
- developing simple and practical guidelines and tools that could be used in assessment of situations , identifying needs and possible responses in different settings, as well as for programme monitoring, evaluation, reporting and documentation;
- organizing national and regional meetings to facilitate networking and information-sharing including facilitating establishment of regional and national networks;
- supporting capacity-building in establishing , managing , monitoring and evaluating projects;
- mobilizing national and external resources for 'Healthy Settings' activities
- assisting Member States/national authorities in better understanding the concept of 'Healthy Settings'.

It is in the context of the 'Healthy Settings' approach that WHO, and particularly the WHO Kobe Centre in Japan, developed the Urban health equity assessment and response tool (Urban Heart). This tool aims at assessing inequalities in the distribution of environmental risk factors to health in urban settings, and taking policy decisions to address them. Cameroon, Kenya and Zambia have received support to develop the competencies of selected municipal staff in the use of the tool, which is now being field-tested in these countries.

WHO has also developed a guide on essential environmental health standards in health care and a guide on water, sanitation and hygiene standards for schools in resource-poor settings. These two guides are intended to support implementation of 'Healthy Settings' initiatives in African countries.

3.2.8. Indoor air pollution

Indoor air pollution arising from household use of solid fuels (e.g. wood, crop waste, animal dung, charcoal and coal), has been identified as one of the most important environmental contributors to global disease burden, and is especially relevant in the African Region.

Reported here are a number of activities on household energy and health that are relevant to the Libreville Declaration, addressing information, monitoring, support for intersectoral policy development and implementation, and the development and evaluation of community-based household energy interventions. Included in the latter group are two projects designed to assess the practicality and added value of integrating interventions for household energy and safe water.

For the purpose of evaluating risk in countries, the type of fuel used by households for cooking represents the most widely available indicator for assessing population levels of exposure to indoor air pollution and for monitoring change. In 2004, WHO established a global household energy database, bringing together nationally representative survey data on the main cooking fuels, by urban and rural location, and where available, information on cooking location and use of ventilated stoves (chimneys, hoods etc.), and variations in fuel type by educational level of the mother and by relative household wealth. In 2009, a substantial update was carried out, and the database currently includes over 400 surveys representing 143 countries. Of the 46 countries in the WHO African Region, 44 (96%) are now represented.

In 2009, WHO collaborated with the United Nations Development Programme (UNDP) to produce a report on energy access: *The energy access situation in developing countries: a review focusing on the least developed countries and sub-Saharan Africa*.¹¹ This report examines the situation regarding access to electricity, cleaner fuels for cooking, and improved stoves; the health impacts resulting from indoor air pollution; and the numbers of countries with targets for addressing energy access. Overall, for sub-Saharan Africa, for which data was available for 43 countries, the picture remains one of very poor overall access, with some 560 million people (74%) without access to electricity, and 625 million (83%) lacking access to modern, cleaner cooking fuels. In rural areas of sub-Saharan Africa, only 11% and 5% have access to electricity and modern cooking fuels, respectively. Adoption of improved cooking stoves (defined as closed stoves with a chimney or open fires with a hood) is still extremely low, with only 6% of those using solid fuels in sub-Saharan Africa currently having access. The health burden associated with indoor air pollution in the WHO African Region is substantial, amounting to 551 000 deaths (for the year 2004), due to child pneumonia, chronic obstructive pulmonary disease and lung cancer. A relatively high proportion of these deaths (53%) are from child pneumonia, due to the high underlying rates of pneumonia in Africa and the very high proportion of homes that rely on solid fuels.

A relatively high proportion of countries in the African Region have targets for energy access, reflecting a commitment of many countries. The UNDP/WHO report found that, for sub-Saharan Africa, 78% had targets for electricity, and although only 29% and 16% had targets for modern fuels and improved cooking stoves, respectively, these figures were higher than for other developing country regions.

The UNDP/WHO report also concluded that little progress had been made in recent years in improving access to electricity and modern fuels. More detailed work on energy access is planned for 2010, for the region and for individual countries, with a special focus on socioeconomic inequalities in access overall and on trends, as well as improving accessibility of the WHO database.

¹¹ *The energy access situation in developing countries: a review focusing on the least developed countries and sub-Saharan Africa*. United Nations Development Programme and World Health Organization, 2009 (<http://www.who.int/indoorair/publications/>, accessed 24 February 2010).

A number of activities have been carried out in support of policy development and implementation. In February 2008, a meeting was held in Rwanda with the East Africa Community (EAC) Partner Steering Committee in respect of strategy to scale-up access to modern energy services. WHO attended to provide information on indoor air pollution. A key theme promoted by WHO was the potential benefit of strengthening collaboration between the health and energy sectors. To support implementation in countries, WHO has developed a *Model country action plan on household energy and health*, which was also shared with members of the EAC Partner Steering Committee at the meeting. The aim of this action plan is to support national efforts to scale up the provision of clean household energy. In essence, this provides a toolbox to translate national strategic goals into directives, outcomes and activities. The plan, which is currently still at the development stage, is divided into six focus areas:

- 1) Capacity-building in the health ministry;
- 2) Normative guidance (adaptation of WHO air quality guidelines, and technology benchmarks);
- 3) Awareness-raising and information campaigning;
- 4) Mainstreaming household energy and health into all national sectoral policies;
- 5) Monitoring of implementation, process outputs, and outcomes;
- 6) Research and development.

Feedback from the EAC committee was positive and encouraging. Discussions were also held during July 2009 with a small number of countries, which have expressed interest in the plan, its potential value, and willingness to collaborate on further development, trial implementation and evaluation.

A number of intervention projects have also been implemented during the 2008–09 period. WHO and the US Centers for Disease Control and Prevention (CDC) launched a joint initiative to assess the practicality and added value of integrating interventions for cleaner household energy and water treatment and storage. In response to this initiative, two projects – one in urban Douala (Cameroon) and one in rural Nyanza (Kenya) – have been implemented, and recently evaluated. Both projects promoted chlorine-based treatment, safer water storage and locally-developed improved biomass stoves, using NGO-trained community educators and promoters. Evaluation reports will be available early in 2010, and for the Kenya project more detailed research findings from a collaborative surveillance programme with CDC will be available in due course. Initial findings indicate that integrated delivery of interventions to address these two important areas of household environmental health risk is probably more cost-effective and achieves better compliance than individual approaches. Households also appreciate the coherence between the products on offer and the range of serious health problems that they and their children face: namely diarrhoea, cholera and respiratory illness. If these initial impressions are confirmed, this experience may have important strategic implications for the delivery of household energy and HWTS interventions more widely across the region. A follow-up workshop to review and disseminate experience from the two projects is provisionally planned for mid-2010.

3.2.9. Building capacity for health impact assessment

Health impact assessment (HIA) is widely recognized as a key tool to facilitate the upstream identification and management of environmental threats to health associated with various sector policies, plans and projects. It is also seen as a key vehicle to facilitate the intersectoral action/

collaboration required to forge the strategic environment and health alliances called for in the Libreville Declaration. In an attempt to address the dearth of knowledge and experience with HIA in the region, and two regional training events on HIA in urban areas were delivered.

The first course was held in Libreville, Gabon in October 2008 and included 49 participants from: Algeria, Angola, Burkina Faso, Burundi, Cameroon, the Central Africa Republic, Chad, the Democratic Republic of Congo, Equatorial Guinea, Gabon, Mali, Mauritania, Niger, the Republic of the Congo, Rwanda and Sao Tome and Principe. A second training course on HIA and Healthy Cities was delivered in November 2009 in Algiers, attended by 42 individuals, mainly from the National Institute of Public Health.

Both courses were developed and delivered by the Centre for Research into Environment and Health (IGES) at the University of Geneva – Institute for Environmental Sciences, with support from the Healthy Cities Network in Quebec, Canada, and the WHO Regional Office for Africa. Technical and financial support for these activities was also provided by the WHO Public Health and Environment department.

There is current interest to further develop the capacity for and implementation of HIA in some African countries, especially in the context of natural resources use (mining, oil, forestry), which also builds on the WHO initiative with development banks, to introduce health into the banks' criteria for evaluating projects for lending.

3.2.10. Radiation

a) Ionizing radiation

More than 500 million people in Africa do not have access to electricity, and generation of electricity is concentrated in a few countries. Nuclear power is only a small part of Africa's energy supply (there are two nuclear power reactors in South Africa) but its contribution will grow in the future. A new reactor is planned in South Africa and Egypt has declared that its nuclear energy programme will be restarted. Moreover, Cameroon, Kenya, Ghana, Morocco, Nigeria, Tunisia and the United Republic of Tanzania have all expressed a keen interest in nuclear power.

Several countries in Africa are large uranium producers, which implies the need for a system for occupational radiation protection, as well as for risk assessment and management related to naturally occurring radioactive materials (NORM). Radon concentration is monitored in those countries not only in underground mines, but also in residences. Phosphate materials used for production of phosphate fertilizers contain a minor quantity of NORM. Morocco holds by far the largest reserves of phosphate rock and has always played a major part in mining and early stage processing of raw materials.

Beyond these sectors, radiation sources are widely used in Africa in medicine, industry and education, and it can be expected that their application will expand in the coming years. Remarkable progress has been made in recent years in the development and application of new technologies that utilize radiation for the diagnosis and treatment of human diseases and it is expected that the use of radiation for medical purposes will continue to increase in Africa. While new equipment and techniques are bringing new benefits, in some cases they involve the delivery of higher radiation doses. Because of this extensive use of radiation in health-care

settings, the promotion of radiation safety in medicine is currently an important public health issue.

This implies an emerging challenge for the continent to ensure that sustainable radiation safety and security systems are in place to protect people and the environment from effects of ionizing radiation, promote appropriate use of radiation in health care, minimize the likelihood of accidents or malicious acts, and build capacity for responding to emergencies.

To improve radiation safety in the various fields where radiation sources are used in Africa, the 3rd African International Radiation Protection Association Regional Congress (AFRIRPA 2010) is being organized in cooperation with WHO and the International Atomic Energy Agency. This congress, to be held in Nairobi, Kenya, 19–24 September 2010, will provide a platform to share current developments and future trends in radiation protection and will allow the building of radiation protection capacity in the region. WHO is fully engaged in the development and execution of the scientific programme of the congress. The thematic sessions, background plenary sessions and refresher courses will address key radiation protection issues and challenges in the region such as:

- environmental health impact of uranium and other industries involving radioactive materials in Africa;
- implementation of the new radiation protection recommendations and radiation safety requirements in Africa;
- appropriate use of radiation in health care;
- impact of the regulations on NORM industries;
- potential consequences on environmental health in Africa of a world revival of the nuclear industry;
- preparedness and response to radiation emergencies.

WHO is conducting a Global Initiative on Radiation Safety in Health Care Settings to mobilize the health sector towards safer and more effective use of radiation in medicine. Under this global initiative, WHO is collaborating with the African Society of Radiology for the development of referral guidelines for appropriate use of radiation imaging in resource-poor health-care settings. An area of special concern is the unnecessary use of radiation when clinical evaluation or other imaging modalities could provide an accurate diagnosis. The use of decision-making tools like evidence-based referral guidelines for appropriate use of radiation in health care could significantly reduce population radiation exposure as well as health-care costs by preventing unnecessary radiological medical procedures. Such referral guidelines are not available worldwide, in particular they are lacking in most developing countries. An international consultancy on referral guidelines for appropriate use of radiation imaging will be held 1–3 March 2010 at WHO headquarters in Geneva, with the active participation of members of the African Society of Radiology in the expert panel.

b) Non-ionizing radiation

Public concern about the health risks associated with mobile telephony prompted several countries within the East African Community to request technical advice from WHO on the

development of electromagnetic fields (EMF) standards for the region (Burundi, Kenya, Rwanda, Uganda, United Republic of Tanzania). In addition, WHO also participated in several regional meetings about the health impacts of mobile telephony:

- 28–29 October 2008, Arusha, United Republic of Tanzania, First East African Workshop on EMF Exposure and Health – under the auspices of the Tanzanian Atomic Energy Commission.
- 2–3 November 2009, Arusha, United Republic of Tanzania, Second East African Workshop on EMF Exposure and Health: Harmonizing EMF Risk.
- 5–6 November 2009, Kampala, Uganda, National Workshop on Electromagnetic Fields Exposure and Health – under the auspices of the Uganda Communications Commission.

3.2.11. Control of disease vectors

Vector-borne diseases, in particular malaria and other neglected tropical diseases, represent a major contributor to the overall disease burden in Africa. Understanding vector ecology and biology is essential to formulate adequate policies and vector control strategies in the context of integrated vector management.

a) Preparation of national entomological profiles

Currently, there is a renewed interest in vector control in general and in indoor residual spraying in particular. However, an evidence-based vector control programme implies sound, up-to-date knowledge on the local vectors, including vector species, biology, ecology and genetics, as well as space-time clustering of key entomological parameters. Although a number of entomological studies have been carried out in many countries, the available information is not accessed and used for policy and technical decision-making in vector control.

In order to start filling gaps in knowledge of disease vectors and to facilitate decision-making by national malaria control programme managers, who are not in most instances medical entomologists, WHO developed a methodology for the preparation of national malaria entomological profiles. Six countries had already completed these profiles in 2007. Since 2008, seven additional countries have been provided with technical support and funding to prepare their profiles.

As resistance to insecticides is spreading rapidly, there is a need for a robust database that is publicly accessible, for data specifically on insecticide resistance in African countries. The “Entomobase” has been developed to be an Africa-wide platform for sharing entomological data, especially on malaria vectors. The Entomobase is a relational database created to provide each country with a complete set of all the ecological and entomological information that has been produced and published so far. This information is presented in a way that makes it easy for decision-makers to select and apply specific vector control interventions or a combination of interventions that are knowledge-based and locally appropriate. The database outputs are presented in the form of maps, tables and graphs that constitute the basis of the country malaria entomological profile. Collaboration with major institutions around the world, such as the Liverpool School of Tropical Medicine (UK), the South African Medical Research Council, the University of Notre Dame (USA), the Institute for Molecular Biology and Biotechnology (IMBB) of the Foundation for Research and Technology, Heraklion (Greece), and the African Network on

Vector Resistance to Insecticides (ANVR), is being undertaken to incorporate the Entomobase in a wider consortium aimed at building a global interactive database on disease vectors.

b) Entomological capacity strengthening

An assessment made in 2005 demonstrated that capacities in vector surveillance were generally weak in the region. Most countries were unable to adequately introduce new tools such as new insecticides in their national malaria control interventions.

WHO received a grant from the Bill and Melinda Gates Foundation to implement a project entitled "Malaria vector control: Filling the gap between product development and effective delivery". This project intends to strengthen national capacities for an effective delivery of vector control interventions in order to safeguard the efficacy of current tools and to ensure the smooth introduction of newly developed tools into malaria control packages. The project objectives are:

- to strengthen infrastructure, technical and institutional capacities for effective vector control in malaria-endemic countries, with a particular emphasis on resistance management;
- to develop up-to-date country databases on the status of malaria vector resistance to insecticides and facilitate the use this information for the selection of insecticides to be used for malaria vector control;
- to facilitate the development, harmonization and use of methodologies and decision support systems in malaria control;
- to develop country capacities to introduce new tools in malaria vector control and to manage insecticide resistance.

With the support of this project, seven countries (Cameroon, Kenya, Madagascar, Mali, Mozambique, Senegal and the United Republic of Tanzania) have been able to identify national reference vector control units (NRUs). NRUs are generally research institutions that have been strengthened with equipment, supplies and staff to provide advanced and high-level technical and scientific support to national malaria control programmes. NRUs are now able to train staff from control programmes on insecticide resistance monitoring and on basic entomology and vector control techniques, in entomological assessments and vector control, using the standard operating procedures (SOPs) for surveillance of disease vectors, which have been developed by WHO. Vector resistance monitoring activities are underway in all seven countries.

NRUs have been instrumental in the establishment of sentinel sites, and in training of national malaria control staff at central and local levels. The NRUs are now performing sample processing for the detection of resistance mechanisms. Project countries are now able to generate specific entomological reports including resistance data. The project implementation framework has become an opportunity for the countries to implement other vector research and control activities. For instance, sentinel sites created and equipped through the project grant are now being used to gather entomological information for evidence-based monitoring and evaluation of national malaria control and ongoing programmes for long-lasting insecticidal nets (LLIN) and indoor residual spraying of insecticides (IRS).

c) Country support for vector control

WHO has been working with partners in malaria control to achieve universal access to cost-effective interventions including vector control. This multifaceted support has been provided on a country-by-country basis, with a clear focus on resource mobilization through assistance in funding proposal development, provision of technical guidelines, training of field staff and assessment of coverage of interventions.

WHO assisted in the development of IRS and LLIN policies and guidelines in Botswana, Ethiopia, Malawi, Nigeria, Uganda, the United Republic of Tanzania and Zimbabwe. Malaria Programme Performance Review (MPR) tools and guidelines were developed and used in Botswana, Kenya and South Africa. Country vector control personnel were trained in IRS in Kenya, Madagascar, Mozambique and Zambia. The assessment of the quality of spraying, through provision of selected test kits, was supported in Botswana, Eritrea, Ethiopia, Kenya, Mozambique and Uganda. In collaboration with partners, WHO supported planning for distributing LLINs in Comoros, Mozambique, Uganda and the United Republic of Tanzania, and contributed to the re-treatment of 3.2 million conventional nets in Kenya. Specific support was provided to Sierra Leone to develop a comprehensive vector control policy using the Integrated Vector Management Strategy for the control of neglected tropical diseases.

Information on status of implementation, coverage and impact on diseases (in some cases) has been collected from various countries in the region. To date, a total of 24 countries implement IRS at programme level. These programmes cover about 45 million people across the region, both in seasonal and perennial transmission areas. IRS coverage of populations at risk of malaria increased from 36% in the 2006–2007 season to 47% in 2008–2009 season. Though the intervention has been increasing gradually over the last few years, the increase in the last 2–3 years is much more significant and indicates government and partners' commitment to achieve the set targets for malaria reduction. Vector control profiles have been produced for 18 countries and effort is underway to complete the information for others.

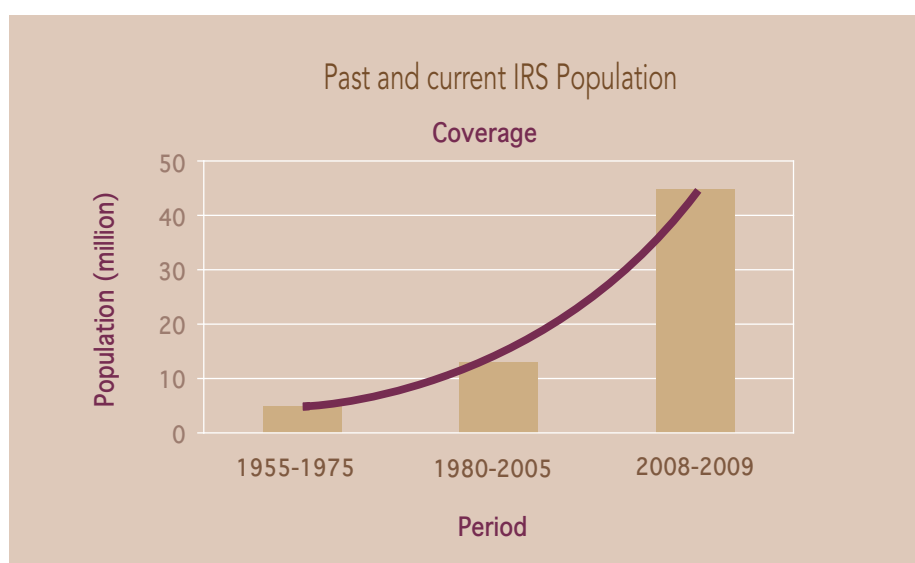


Figure 3 IRS programmes in the WHO African Region, 1955–2009

4. Research

WHO has continued to promote the development of a strong research agenda and to support a number of research projects (mainly operational research). A specific emphasis has been given to projects contributing to improving the cost-effectiveness of available tools, interventions and strategies.

4.1. Development of a research agenda on climate change and health in the Africa Region

A climate change research agenda is being developed with the WHO Kobe Centre and WHO headquarters, focusing on selected health impacts of climate change and on piloting adaptation strategies in Africa.

4.2. Non-treatment options for safe wastewater and excreta use in poor urban communities and agricultural settings

An expanding phenomenon in the periphery of many larger African cities is that of informal agriculture, relying on urban wastewater effluents. This type of agriculture may take many forms, but it usually implies cultivation on small plots, regular shifting of location and an informal process of production and distribution. Produce relates to demand from urban populations with an emphasis on crops like lettuce, tomatoes, onions and other vegetables that may be eaten raw. While in some cases the urban wastewater may include industrial waste, in most cases it is the microbiological contamination of wastewater coming from people's homes that poses the greatest public health concern. The third edition of the WHO *Guidelines for the safe use of wastewater, excreta and greywater in agriculture and aquaculture*¹² presents the methods and procedures for effective risk assessment and management, aimed at protecting farmers, their families, marketers and consumers.

Since 2006, WHO, FAO and the Canadian International Development Research Centre (IDRC) have been carrying out studies in four sites (Kumasi and Tamale in Ghana, Dakar, Senegal and in a refugee camp in Jordan) to learn about the opportunities and constraints related to implementing the guidelines in real-life situations and the results are scheduled to be published in 2010.

The projects in Ghana and Senegal on non-treatment options for safe wastewater and excreta use in poor urban communities and agricultural settings are informed by WHO *Guidelines for the safe use of wastewater, excreta and greywater in agriculture and aquaculture*, and have contributed to the following three areas:



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¹² World Health Organization/United Nations Environment Programme. *WHO Guidelines for the safe use of wastewater, excreta and greywater in agriculture and aquaculture*. Geneva, World Health Organization, 2008.

- 1) Health in development, where the use of wastewater is a huge potential activity in relation to growing cities in Africa, in food production.
- 2) Health security, aiming at securing better health for urban populations, especially the poor, through minimization of hazards in the environment.
- 3) Evidence for health policy, where the knowledge base and the gap between policy and action will be improved in the region.

The objectives of the projects are:

- to identify economically, technically and socially appropriate non-treatment options for health protection such as crop restriction, wastewater, excreta and greywater application techniques that reduce levels of exposure to hazards and exposure control measures, such as the use of personal protective equipment, hygiene education, food safety measures etc. as promoted by the WHO guidelines;
- to study the feasibility and potential effectiveness of the non-treatment health protection measures in reducing the disease burden associated with the use of wastewater, excreta and greywater;
- to increase awareness of the guidelines in the international development community and among national governments;
- to synthesize research findings into a joint WHO/IDRC document that will help low-income countries adapt the WHO guidelines for effective application in their own unique circumstances.

The studies are still ongoing but will serve as good examples in turning potential hazards into a health-improving resource base.

4.3. Integrating indoor air quality and household water treatment projects at the household level

Africa suffers significantly from the environmental risks of unsafe drinking-water, inadequate sanitation and indoor air pollution. African children are the most vulnerable group for all these risk factors.

The objectives of the integration initiative are:

- to explore whether it is possible to achieve synergy between linking household water treatment (HWT) and indoor air quality (IAQ) interventions;
- to examine the potential for expansion of implementation of such joint projects;
- to document integration models for these projects;
- to examine the added value of integrating these two initiatives, in a way that contributes to an increase in health impact, as well as sustainability and adoption of use.

The project is being implemented in Cameroon and Kenya. In Cameroon, fuel-efficient stoves and point-of-use chlorination methods have been introduced into an ongoing water and sanitation project implemented by the German Technical Cooperation Agency (GTZ), in an informal settlement of Douala, accommodating over 1250 households. The project activities include well chlorination, latrine building and health education, as well as wastewater and solid-waste management.

In Kenya, the project is implemented by an NGO receiving support from the US CDC. The system wide approach is integrating indoor air quality and household water treatment in 10 out of 60 villages enrolled in the Nyando Integrated Child Health and Education Project, in Nyanza province, Kenya. This project is funded by the US Environment Protection Agency.

4.4. Demonstrating cost-effectiveness and sustainability of environmentally sound and locally appropriate alternatives to DDT for malaria vector control in Africa

Vector control with the application of insecticides including dichlorodiphenyltrichloroethane (DDT) is one of the major strategies for malaria control in the WHO African Region. However, in recent years the use of DDT has become increasingly controversial due to its alleged health and environmental risks. In view of this, and the inevitable expansion of malaria vector control in the coming years, supporting countries to diversify their vector control strategy has become important. In order to achieve this, WHO received a grant from GEF to implement a project entitled “Demonstrating cost effectiveness and sustainability of environmentally sound and locally appropriate alternatives to DDT for malaria vector control in Africa”.

The project’s main objective is to test alternative interventions that are cost-effective, environmentally sound, sustainable and replicable in other parts of the world where DDT is still currently used for vector control. The project objective will be achieved by strengthening the capacity of countries at national and local levels to control malaria. The project will be implemented in three countries, namely Eritrea, Ethiopia and Madagascar, for a duration of four years.

4.5 Development of the Malaria Decision Analysis Support Tool

A project proposal entitled “Malaria Decision Analysis Support Tool (MDAST): Evaluating health, social and environmental impacts and policy trade-offs” was submitted to UNEP by WHO for funding in December 2006 and approved in 2009.

The project aims to promote evidence-based, multisectoral malaria control policy-making in three African countries (Kenya, Uganda and the United Republic of Tanzania) through the use of a comprehensive framework for assessing the full range of health, social, and environmental risks and benefits associated with alternative malaria control strategies. The project involves a diverse set of organizations locally and internationally whose respective strengths combine to create strong complementarities and synergies. Duke University in the USA and the University of Pretoria in South Africa are the two main collaborating research institutions.

5. Major publications

Health security through healthy environments. First Interministerial Conference on Health and Environment in Africa:

The report provides an insight into the deliberations of the Libreville Conference, the proceedings of the technical and scientific meeting, the proceedings of the ministerial meeting and the reviewed conference papers.¹³

The Libreville Declaration on Health and Environment in Africa:

The declaration reaffirms government commitments to implement all conventions and declarations that bear on health and environment linkages. It expresses the concerns of governments regarding the current impacts of environmental risk factors to human health and ecosystem integrity. It recognizes the urgent need for action including research and also the current country challenges. It expresses the commitments of countries on 11 priority actions and gives a mandate to WHO and UNEP to work with partners in order to support countries' efforts.¹⁴

The roadmap to support the implementation of the Libreville Declaration on Health and Environment in Africa (2009–2010):

The purpose of this roadmap is to identify the process and key milestones for implementing the Libreville Declaration at national and international levels. It represents the basis against which countries and their partners will report to ministers of health and ministers in charge of environment at their second meeting in 2010. The roadmap will also serve as the basis for coordinated partner actions in support of country processes.¹⁵

Implementation of the Libreville Declaration on Health and Environment in Africa: Country situation analysis and needs assessment guide:

This guide proposes step-by-step assessment procedures and detailed methodology that allows the subsequent reproduction of the exercise, specifically to allow for a proper evaluation of the outputs, outcomes and impact of the national plan of action. The standardized structure and approach also allow comparability of results between countries, to add up or extrapolate to a regional picture.¹⁶

¹³ *Health security through healthy environments. First Interministerial Conference on Health and Environment in Africa.* Brazzaville, World Health Organization Regional Office for Africa, 2009.

¹⁴ *Libreville Declaration on Health and Environment in Africa.* Brazzaville, United Nations Environment Programme and World Health Organization Regional Office for Africa, 2009.

¹⁵ *Meeting of Partners on the Implementation of the Libreville Declaration on Health and Environment in Africa. The roadmap to support the implementation of the Libreville Declaration on Health and Environment in Africa (2009–2010).* Brazzaville, United Nations Environment Programme and World Health Organization Regional Office for Africa, 2009.

¹⁶ *Implementation of the Libreville Declaration on Health and Environment in Africa: country situation analysis and needs assessment guide.* Nairobi, United Nations Environment Programme Regional Office for Africa.

The Health and Environment Linkages Data Management System (HELDS):

HELDS was developed to ensure a level of standardization of information collated from various countries. HELDS has an ambition to become a unique database in the African Region, where standardized country-specific information on environmental risk factors to human health and ecosystem integrity will be located and accessible in the public domain. So far, HELDS has been rolled out in Kenya and Gabon. Cameroon, Ethiopia, Ghana, Mali, Mozambique and Swaziland have also received training on HELDS.¹⁷

How is children's health linked to the environment? Information and resources for action in Africa:

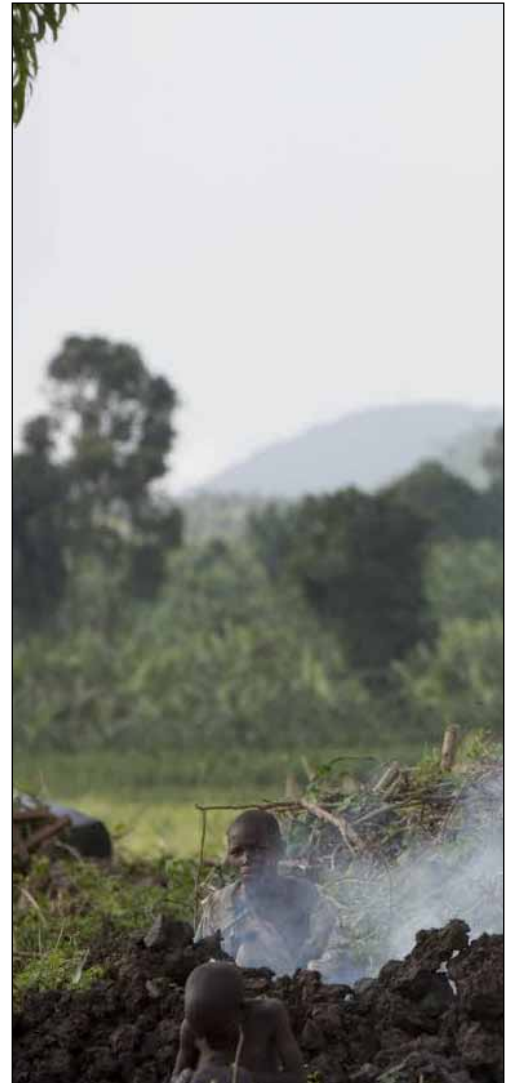
This document describes efforts to protect children's health from environmental threats/risks including providing information and resources for action. This regional report on is based on the *Children's environmental health profiles* from 16 countries and *Children's environmental health indicator* reports from three countries. The report summarizes the status of children's environmental health in the region, describes specific environmental threats to children, including case studies, and proposes a strategy for ensuring a healthy environment for children as well as providing a list of tools and mechanisms available to reduce and prevent environmental threats to the health and safety of children. The document calls upon parents, teachers, communities, policy-makers, and all those concerned about the next generation, to join forces in working towards a healthier environment for African children.¹⁸

¹⁷ *The Health and Environment Linkages Data Management System*. Brazzaville, United Nations Environment Programme and World Health Organization Regional Office for Africa, (In press).

¹⁸ *How is children's health linked to the environment? Information and resources for action in Africa*. Brazzaville, World Health Organization Regional Office for Africa, 2009.

6. Conclusion and perspectives

The *WHO Medium-term Strategic Plan (2008–2013)* has provided momentum and opportunities to redress noted imbalances and gaps in public health programmes particularly in the African Region. It is on its policy and programmatic orientations, including those specific to the African Region, that a new era in policy formulation to coherently and effectively address the broader determinants of health has been launched. It has already been noted, for instance, that within countries that have initiated the implementation of the Libreville Declaration, new institutional arrangements and working procedures are being established to foster stronger and more direct policy options that create synergies among the various development sectors. With this in mind, there is renewed hope that sectors outside health will soon be fully engaged in delivery of health- and environment-based interventions in a coordinated manner. The immediate expected impact will be a reduction in the incidence of air-, water- and vector-borne diseases, injuries and chemical incidents, while demonstrating the economic value of environmental preservation. Health systems will no doubt be among the most important beneficiaries, given that new players from sectors other than health will participate in the delivery of these interventions. This will also open avenues to new resources, such as the climate change adaptation funds. Success will depend on how best the health sector is able to prove its value and contribution to other development sectors.



Democratic Republic of the Congo. Tents, near a latrine, Kibati I camp.

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7. Annexes

Annex 1: Libreville Declaration on Health and Environment in Africa

Libreville, 29 August 2008

We, African ministers responsible for health and the environment, meeting from 28 to 29 August 2008 in Libreville, Gabon;

Reaffirming our commitment to implement all conventions and declarations that bear on health and environment linkages, in particular the:

- Stockholm Declaration on the Human Environment (1972);
- Alma-Ata Declaration on Primary Health Care (1978);
- Bamako Convention on Hazardous Wastes (1991);
- Declaration of the UN Conference on Environment and Development, Rio de Janeiro (1992);
- Millennium Declaration and the subsequent Millennium Development Goals (2000);
- Johannesburg Plan of Implementation adopted by the World Summit on Sustainable Development (2002);
- Health Strategy of the African Union (2006);
- Algiers Declaration on Desertification (2006);
- Algiers Declaration on Health Research in Africa (2008);
- Ouagadougou Declaration on Primary Health Care and Health Systems (2008);
- eThekweni Declaration on Hygiene and Sanitation (2008);
- Bali Declaration on Waste Management for Human Health and Livelihood (2008).

Concerned that:

- Over 23% of deaths in Africa, estimated at more than 2.4 million each year, are attributable to avoidable environmental risk factors, with particular impacts on the poorest and the most vulnerable groups (children, women, rural poor, people with disabilities, displaced populations and the elderly).
- 60% of the vital ecosystem services of the planet are being degraded, or are being subjected to excessive pressures, and that it is these services that maintain the quality of air, land and water resources.
- The Bamako Convention on Hazardous Wastes adopted in 1991 is not being implemented.
- Africa is increasingly being affected by natural disasters caused by climate change.

Recognizing that:

- There is a need for further research to increase understanding of the vulnerability of humans to environmental risk factors, particularly in Africa.
- It is necessary and urgent to implement in our countries the imperative of sustainable development in efforts to achieve economic growth.
- There are constraints on accelerated implementation of the necessary integrated strategies to protect populations against risks resulting from environmental degradation including risk factors such as safe water supply, sanitation, air quality, vector-borne diseases, chemicals, waste management, new toxic substances, desertification, industrial and domestic risks, and natural disasters.

Convinced that:

- The emergence of new environmental risks (climate change, industrial expansion, and new technologies) presents new threats to public health.
- Africa is, of all the world's geographic regions, the most vulnerable in the face of these challenges.
- Well-managed health and environmental risks impact positively on national economies, including through increased foreign direct investments and tourism.
- The involvement and commitment of all actors is necessary for concerted and coherent action.
- Health security can be achieved through a healthy environment.

Therefore *declare* that we African countries commit ourselves to:

- 1) Establishing a health-and-environment strategic alliance, as the basis for plans of joint action;
- 2) Developing or updating our national, subregional and regional frameworks in order to address more effectively the issue of environmental impacts on health, through integration of these links in policies, strategies, regulations and national development plans;
- 3) Ensuring integration of agreed objectives in the areas of health and environment in national poverty reduction strategies by implementing priority intersectoral programmes at all levels, aimed at accelerating achievement of the Millennium Development Goals;
- 4) Building national, subregional and regional capacities to better prevent environment-related health problems, through the establishment or strengthening of health and environment institutions;
- 5) Supporting knowledge acquisition and management on health and environment, particularly through applied research at local, subregional and regional levels, while ensuring coordination of scientific and technical publications so as to identify knowledge gaps and research priorities and to support education and training at all levels;
- 6) Establishing or strengthening systems for health and environment surveillance to allow measurement of interlinked health and environment impacts and to identify emerging risks, in order to manage them better;
- 7) Implementing effectively national, subregional and regional mechanisms for enforcing compliance with international conventions and national regulations to protect populations from health threats related to the environment, including accession to and implementation of the Bamako Convention by those countries that have not done so;

- 8) Setting up national monitoring and evaluation mechanisms to assess performance in implementing priority programmes and peer review mechanisms to learn from each other's experience;
- 9) Instituting the practice of systematic assessment of health and environment risks, in particular through the development of procedures to assess impacts on health, and to produce national environment outlook reports;
- 10) Developing partnerships for targeted and specific advocacy on health and environment issues towards institutions and communities including the youth, parliamentarians, local government, education ministries, civil society and the private sector;
- 11) Achieving a balance in the allocation of national budgetary resources for intersectoral health-and-environment programmes.

Call upon:

The World Health Organization and the United Nations Environment Programme to:

- support, along with other partners and donors, including the African Development Banks and African Subregional Economic Communities, the implementation of this declaration, and to increase their efforts in advocacy, in resource mobilization and in obtaining new and additional investments in order to strengthen the strategic alliance between health and environment;
- help African countries in sharing experiences, developing capacity, and establishing a mechanism to monitor progress towards the fulfilment of the commitments made at this conference, through peer review, and to organize a second Interministerial Conference on Health and Environment in Africa before the end of 2010;
- support the implementation of health and environment conventions and agreements and the establishment of an African network for surveillance of communicable and noncommunicable diseases, in particular those with environment determinants.

We call on his Excellency El Hadj Omar Bongo Ondimba, President of the Republic of Gabon, host country, to present this declaration to the African Union.

Signed in Libreville; 29 August 2008.

Annex 2: Windhoek Statement of Partners on the Implementation of the Libreville Declaration on Health and Environment in Africa

We, partners in the implementation of the Libreville Declaration on Health and Environment, gathered with country experts in Windhoek, Namibia, 25–27 February 2009.

Having discussed the implications for the partners of the report of the Libreville expert meeting and the Libreville Declaration and having agreed on the main elements of coordinated actions on health and environment which include advocacy, resource mobilization, capacity building, technical support and monitoring of progress,

Having reviewed and reached consensus on a proposed roadmap towards the Second Interministerial Conference on Health and Environment in Africa that will take place in 2010,

Having examined and agreed on the estimated technical and financial resource requirements and on mechanisms for implementation of the roadmap,

Agreeing that the Health and Environment Strategic Alliance (HESA), as a new country-driven initiative, will help coordinate action by the health and environment sectors and will engage in country-level development planning processes, to effectively utilize health and environment inter-linkages in the protection and promotion of public health and ecosystem integrity,

Agreeing further that at country level, HESA will comprise a formalized coordination mechanism led by ministers of health and environment together, with the engagement of relevant development sectors through their corresponding government departments, as well as major stakeholder groups,

Agreeing also that at the international level, HESA will comprise a global partnership. WHO and UNEP will engage within the UN system with other agencies and also with other partners and donors, including the African Development Bank and African Subregional Economic Communities,

Commit to provide every support to the creation of the Health and Environment Strategic Alliance (HESA) and support further its activities at both country and international levels,

Commit further to promote the initiation as quickly as possible of rapid country Situation Analysis and Need Assessments (SANAs) for the preparation of national plans of joint action and, to this end, identify potential partners and continue to promote the mobilization of adequate resources to ensure the timely completion of those plans before the Second Interministerial Conference in 2010,

Welcome the provision of support from UNEP for a special thematic Africa Environment Outlook report on health and environment,

Finally, we commit also to supporting preparations for, and the organization of, the Second Interministerial Conference on Health and Environment in Africa.

WHO and UNEP will further facilitate the consolidation of, and mobilization of support for, the HESA partnership and will report back to the conference on progress made.

We, partners together with country experts would like to express our most sincere appreciation to the government and people of Namibia for their warm hospitality and the excellent facilities put at our disposal.

Participating partners and countries:

Partners

France

World Health Organization (WHO)

United Nations Environment Programme (UNEP)

United Nations International Children's Fund (UNICEF)

United Nations Development Programme (UNDP)

United Nations Human Settlements Programme (UN-HABITAT)

African Development Bank (AfDB)

Organisation de Coordination pour la lutte contre les Endemies en Afrique Centrale (OCEAC)

Countries

Congo

Gabon

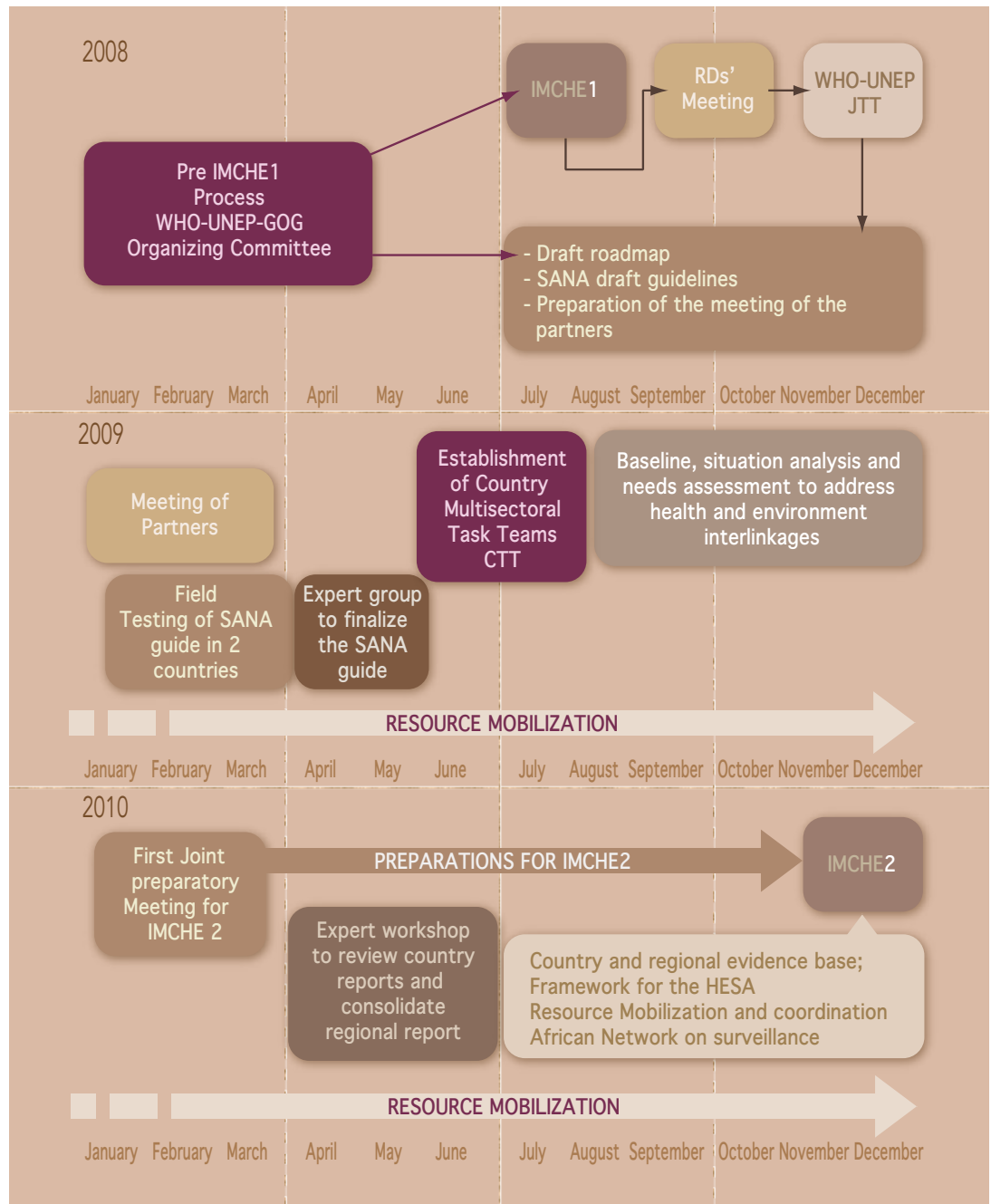
Lesotho

Madagascar

Malawi

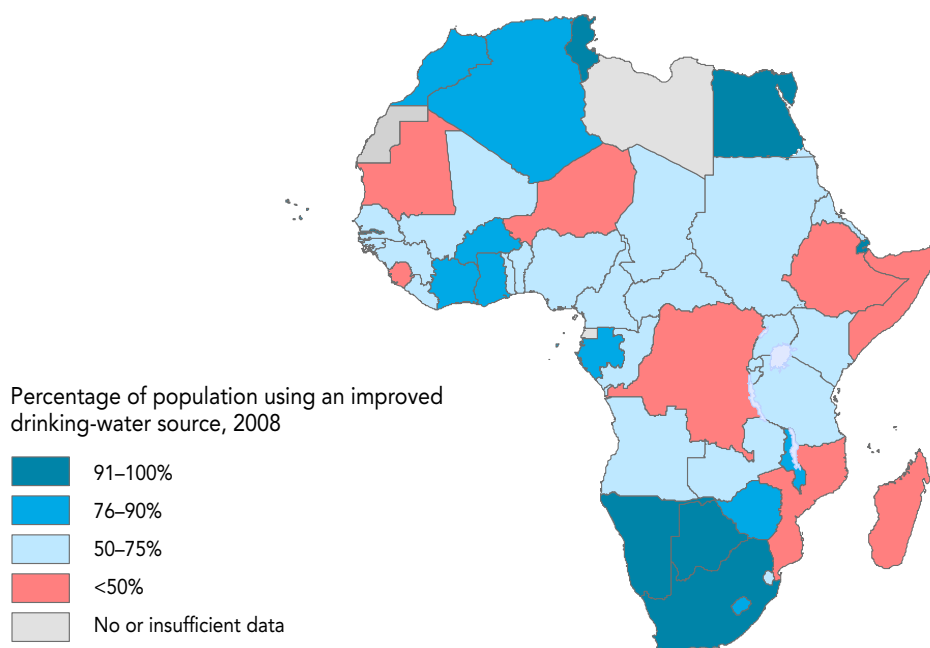
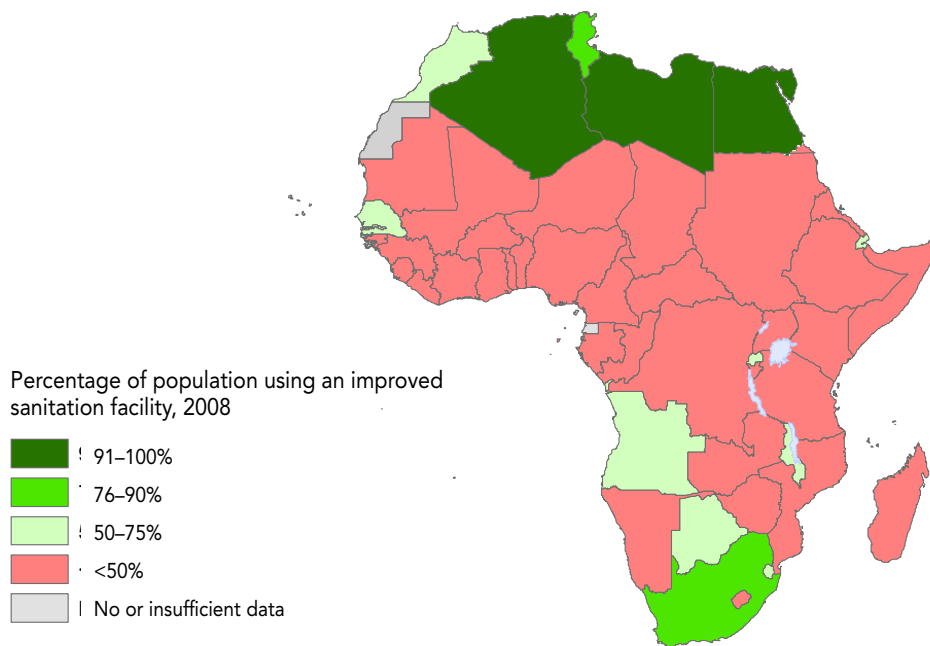
Namibia

Annex 3: The roadmap to implement the Libreville Declaration on Health and Environment in Africa (2008–2010)

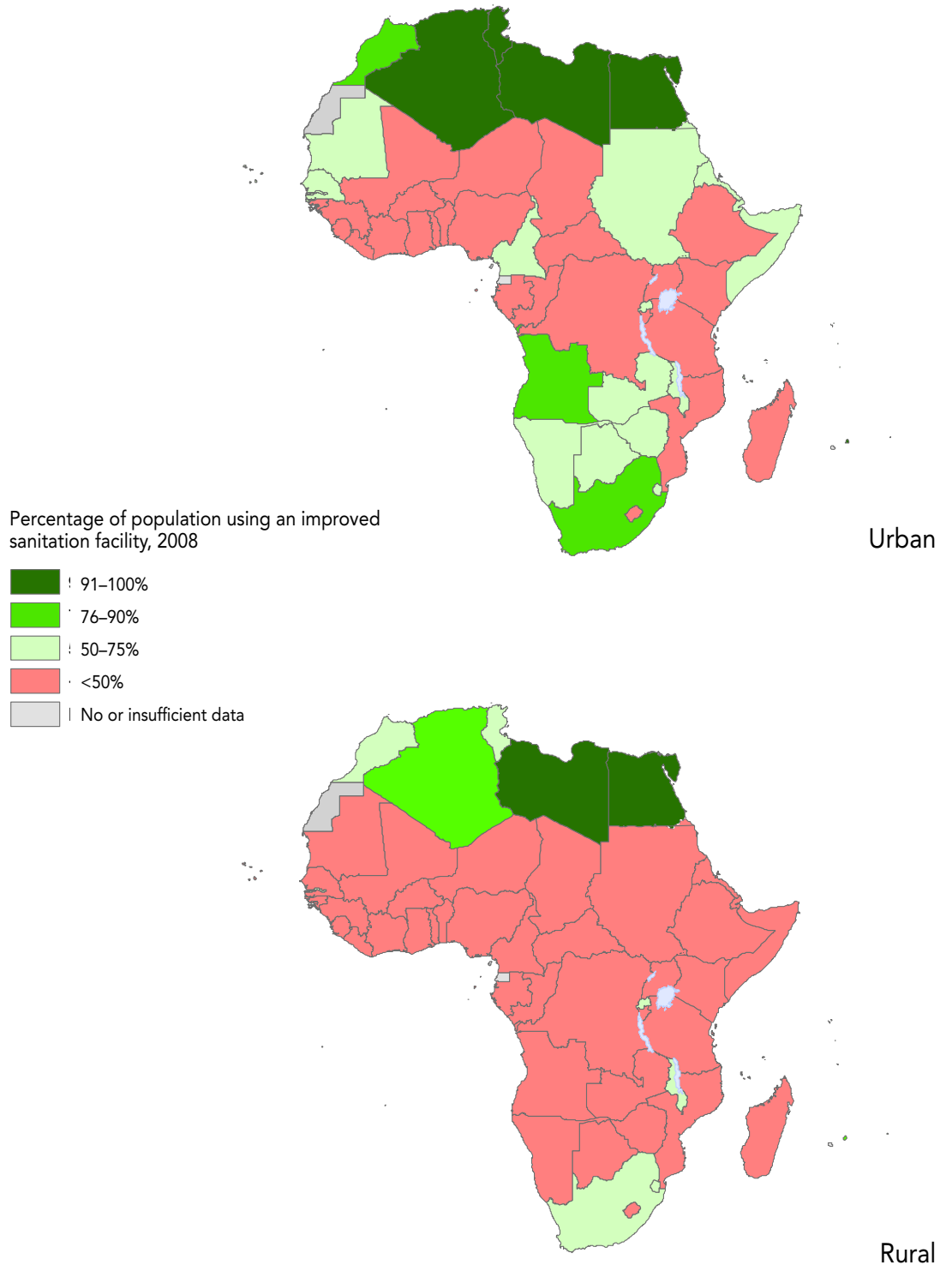


Annex 4: Percentage of population using improved drinking-water and sanitation facilities

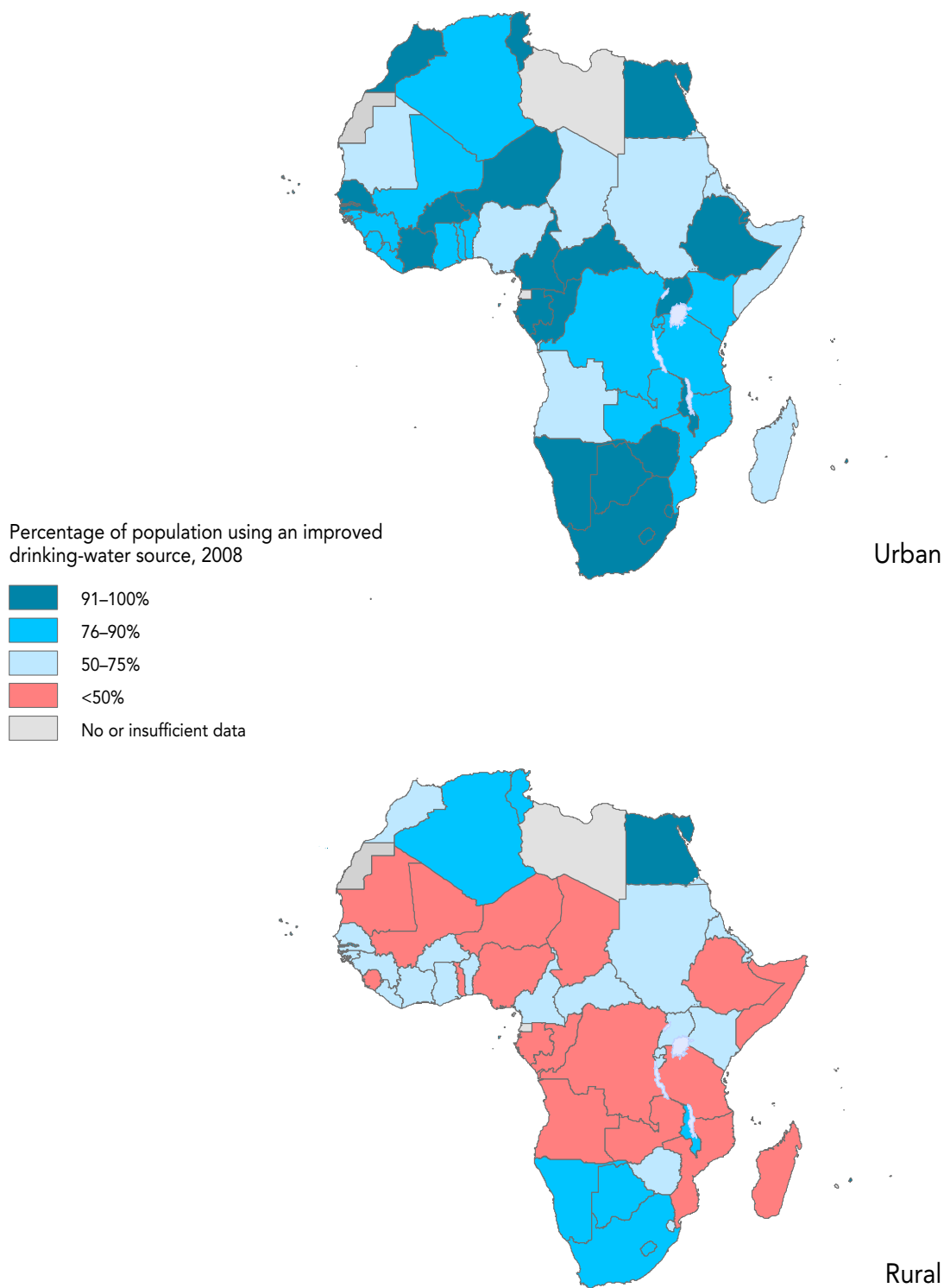
Percentage of population using an improved facility



Urban/rural disparity in the use of sanitation facilities in Africa, 2008



Urban/rural disparity in the use of improved drinking-water sources in Africa, 2008



Source: *Progress on sanitation and drinking water, 2010 update*. Geneva, WHO/UNICEF, 2010.

Notes:



The work of WHO on health and environment is gaining greater prominence, in particular in the African region. During the first biennium of its first Medium Term Strategic Plan, WHO's focus in Africa has been the development and implementation of a comprehensive policy framework for the region in order to strengthen country operations to accelerate the achievement of the Millennium Development Goals.



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