

Situational Analysis and Needs Assessment for Ethiopia

AIR POLLUTION, OCCUPATIONAL HEALTH AND SAFETY, AND CLIMATE CHANGE

FINDINGS, RESEARCH NEEDS AND POLICY IMPLICATIONS

Establishing a GEOHealth Hub for East Africa

School of Public Health, Addis Ababa University, Ethiopia

&

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Section IV

Situational Analysis and Needs Assessment:

POLICY, REGULATORY, AND ORGANIZATIONAL FRAMEWORKS IN ETHIOPIA

Establishing a GEOHealth Hub for East Africa

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Summary

Background

The purpose of this theme, Policy, Regulatory, and Organizational Frameworks, is to examine and identify gaps in national policies, regulations, and organizational arrangements that govern Ethiopia's ability to prevent and mitigate the health impacts of air pollution, occupational hazards, and climate change. The report also reviews the capacity of organizations with the mandate to engage in the above areas.

Methods

The assessment includes a comprehensive literature review of peer-reviewed publications and reports and in-depth interviews with key stakeholders. Literature was identified through electronic searches; when necessary, hard copies of past reports were accessed to review. A semi-structured guideline was used to conduct the in-depth interviews aimed at strengthening the situational analysis and identifying gaps.

Findings

Air Pollution

Air pollution relevant policies are incorporated into national constitutional, health, and environmental law. The Constitution of the Federal Democratic Republic of Ethiopia, for example, gives all persons the right to a clean and healthy environment (Article 44/1) and mandates the government to ensure that right (Article 92/1). Federal health policy also addresses prevention of environmental pollution from hazardous chemical wastes (Article 5/3) and calls for cost-effective interventions to prevention land, air, and water pollution using cost-effective strategies (Article 2/2/f).

Proclamation No. 300/2002 of Environmental Pollution Control, Sub-Article 6/1/b, specifies ambient air quality standards and allowable emissions for both stationary and mobile air pollution sources. The 11 regional states in the country are mandated, under Article 15 of the Environmental Organs Establishment Proclamation No. 295/2002, to establish an independent regional environmental agency, or designate an existing agency, for environmental management. Accordingly, each of the regional states has either formed an independent bureau responsible for environmental matters or created a department for the environment in one of their bureaus. However, enforcing mechanisms are almost nonexistent.

Climate Change and Health

In 2011, the federal government initiated the Climate-Resilient Green Economy (CRGE) initiative to protect the country from the adverse effects of climate change and to build a green economy that will help Ethiopia realize its ambition of reaching middle-income status before 2025. However, the only legal provisions in Ethiopia focusing on climate change and associated issues consist of limited content within the country's environmental policy document.



The Ethiopian environmental policy 1997(3/9/a) recognizes the country's sensitivity to climatic variability and promotes a climate monitoring program. Article 3/9/d of the policy document emphasizes the need to actively protect the ozone layer, recognizing the vulnerability of the Ethiopian highlands (which already have a thin protective atmosphere) to potential suffering due to agricultural losses and adverse health effects from additional exposure to ultraviolet rays.

Institutionally, at the federal level there is a ministerial steering committee chaired by the Prime Minister Counselor and hosted by the Natural Resource Management Department in the Ministry of Agriculture. This institutional structure has not yet extended to the regions and other lower administrative levels although there are designated officials in the regional capitals.

Occupational Safety and Health

No national occupational health and safety policies exist. However, article 2/2 of the National Health Policy of 1993 states that emphasis will be placed on the promotion of occupational health and safety in industries and production sectors. The policy also calls for intersectoral collaboration to develop facilities and mechanisms for workers' health and safety in the production sectors (Article 3/9). With regard to the health and safety of workers, the Labor Proclamation No. 377/2003 gave the Ministry of Labor and Social Affairs (MOLSA) the powers and duties to determine and enforce standards and measures, and to collect, compile, and disseminate information.

Labor Proclamation No. 377/2003, under Sub-Articles 1-8 of Article 92, identifies the occupational safety, health, and working environment conditions that should be ensured by the employer and employees to safeguard workers.

Institutionally, the Ministry of Labor and Social Affairs (MOLSA) and its counterparts in the regional states coordinate all aspects of the labor administration system according to the provisions of existing labor laws. They also co-operate directly with other corresponding centers of power in the federal and regional governments.



Acronyms and Abbreviations

AAU	Addis Ababa University
COP	Conference of Parties
CRGE	Climate Resilient Green Economy
DFID	Department for International Development
EPA	Environmental Protection Authority
FDRE	Federal Democratic Republic of Ethiopia
GHG	Green House Gases
IPCC	Intergovernmental Panel on Climate Change
IRI	International Research Institute
LDC	Least Developed Countries
MOH	Ministry of Health
MOLSA	Ministry of Labor and Social Affairs
MRV	Monitoring Reporting and Verification
MtCO ₂ e	Million Metric Tons of Carbon Dioxide equivalent
NAPA	National Adaptation Program of Action
NMA	National Meteorology Agency
OSH	Occupational Safety and Health
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change



1. Introduction

International commitments on the environment, development, and health have been observed since the Rio Declaration in 1992 which focused on consequences and potential hazards of the environment-development interaction to human beings (1). The Libreville Declaration on Health and Environment in Africa signed by 52 member countries clearly spelt out the impact of environmental risks on the health of populations and related vulnerabilities. It also provided broad regional directions for mitigating the impact of environmental risks in member countries (2).

Anchored in the Libreville Declaration, a country-specific Situational Analysis and Needs Assessment (SANA) was conducted revealing the importance of inter-linkage between health and the environment as a fundamental shift in thinking. Ethiopia produced its Environmental Health SANA report in 2010. The report highlighted the need for a paradigm shift in understanding and dealing with health and environmental issues, which are often viewed as separate entities. Existing policies and strategies were fragmented, compounded by major gaps, lack of capacity, inability to reach implementers, and lack of harmonization in organizational frameworks (3).

We followed the SANA approach to analyze and present findings of Theme IV: Policy, Regulatory and Organizational Frameworks.

Theme IV examines and identifies gaps in national policies, regulations, and organizational arrangements that govern Ethiopia's ability to prevent and mitigate the health impacts of air pollution, occupational hazards, and climate change. Theme IV also reviews the capacity of organizations with the mandate to engage in the above areas.

Identification and analysis of national policies and regulatory frameworks were identified through a situational analysis and a needs assessment. Resources such as trained personnel, financing, materials/equipment, research laboratories, and physical space were evaluated through interviews and site visits. Gaps in national, regional, and local capacity and the concerns of major stakeholders were identified. This report lists and prioritizes policy development and implementation needs based on overlaps between the findings of the SANA and the cross-cutting nature of the needs. The prioritization in this report is based upon the responses of experts from ministries and the document reviews.

2. Methods

Prior to implementing the SANA effort, the research team discussed and reached consensus on carrying out the activities. An orientation for research assistants (RA) outlined the objectives of the Global Environmental and Occupational Health (GEOHealth) project and trained the principal investigators and RAs in the SANA protocols. A time schedule was designed and each research team member was responsible for his or her assigned tasks.



Data collection for the SANA involved two approaches: a comprehensive literature review and semi-structured interviews with key stakeholders. The comprehensive literature review focused on the collection of all available documents. Due to lack of published documents related to any of the GEOHealth themes, much of the literature reviewed was in the form of unpublished reports accessed directly from ministries and other organizations. Electronic searches were carried out, and, when appropriate, hard copies of reports were accessed.

In-depth interviews were used to strengthen the findings from the literature review for the situational analysis and to identify gaps and/or needs not met by current activities and/or capacity. Interviews were conducted with key leaders or program staff within the ministries and other organizations or agencies based on their role and significance in addressing air pollution, climate change, or occupational health and safety (Table 2). A semi-structured guide was used by the interviewers to conduct the interview.

Once information from the literature review was prepared and the in-depth interviews were conducted, the data were synthesized and the gaps and needs were identified.

3. Assessment Findings: Situational Analysis and Needs Assessment

3.1. Situational Analysis

The following analysis resulted from the literature review and in-depth interviews with key persons at various ministries or agencies:

3.1.1. Air Pollution

Policy

The Federal Democratic Republic of Ethiopia (FDRE) Constitution is the basis for all development-related policies, legal provisions, and related outcomes within the country. Article 44/1 of the Constitution gives all persons the right to a clean and healthy environment, while Article 92/1 states that the government has the duty to ensure this right. Article 92/2 of the Constitution requires that the design and implementation of development programs and projects do not damage or destroy the environment (4).

In addition to the Constitution, federal health and environmental policies address environmental health issues. Article 5/3 of the health policy provides guidelines and directives for prevention of environmental pollution resulting from hazardous chemical wastes (5). The FDRE environmental policy lists the following pollution prevention measures (6) as its main objectives:

- 2/2/f. Prevent the pollution of land, air, and water in the most cost-effective way so that the costs of preventive measures do not outweigh the benefits.
- 3/5/g. Recognize that water resources play an important role in meeting Ethiopia's energy demand and that, and that, by generating power, cause no pollution to the environment;



- 4/8/b. Promote training and improve the working conditions of researchers so that they become technically competent.

Regulatory Framework

The regulatory framework for air pollution control in Ethiopia is provided through two key articles that describe the process of setting environmental air quality standards. Sub-Article 6/1/b of the Environmental Pollution Control Proclamation No. 300/2002 specifies ambient air quality standards and provides emission limits for stationary and mobile air pollution sources (7). Sub-Article 6/4 states that national regional states may, based on their specific situation, adopt environmental standards that are potentially more, but not less, stringent than those determined at the federal level (7).

Institutional Framework

Article 5/1/b of the federal environmental policy calls for multilevel coordination among responsible management bodies (federal to local) to ensure sectoral and cross-sectoral planning and implementation. These bodies include concerned ministry commissions, authorities, and bureaus, including relevant federal executive organizations, as well as regional and municipal governments; elected councilors; non-governmental organizations; community representatives; representatives of professional or other environmental associations; and the private sector (6).

The federal Environmental Protection Authority (EPA) was established by Proclamation No. 9/1995. The Environmental Organs Establishment Proclamation Number (No.) 295/2002 expanded the mandates of EPA and further established it as an autonomous organization. The Proclamation decentralized the original central structure of environmental management (8, 9). Article 15 of the Proclamation calls for each of the 11 national regional states to establish an independent regional environmental agency, or designate an existing agency to lead environmental management. In accordance with this directive, each of the regional states has either formed an independent bureau responsible for environmental matters, or created a department for the environment in one of their bureaus. These regional environmental agencies have important functions with regard to monitoring and enforcing environmental legislation (8). The proclamation also stipulates that all government ministries or agencies should establish an environmental unit to ensure that their activities comply with the environmental standards and laws of the country (8). These units are also expected to promote coordination of environmental matters among ministries and agencies. EPA is responsible for participating in the negotiations of international environmental agreements and to ensure their domestic ratification.

Article 7 of the Environmental Pollution Control Proclamation No. 295/2002 established a specialized body, the Environmental Inspectorate, to enforce existing environmental standards in Ethiopia (7). The Inspectorate has a broad mandate to conduct continuous monitoring and surveillance. Environmental



inspectors are empowered to ensure compliance with environmental standards and related requirements. Critics have challenged this mandate as a violation of the right to privacy as guaranteed by the Constitution.

Strategy

The implementation and specific modalities for the realization of the objectives set by the Constitution and environmental proclamations are yet to be formulated. There are no documents outlining the national or regional strategies that ministries and agencies should adopt to translate existing policies, legal provisions, or guidelines for air pollution into practical programs.

Guidelines

Ambient environmental quality standards are set with a goal of safeguarding public health and protecting the environment (Table 1).



Table 1: Guideline standards for priority ambient atmospheric pollutants (10)

Compound	Guideline value ($\mu\text{g}/\text{m}^3$)	Average time
Sulphur dioxide	500	10 minute
	125	24 hours
	50	1 year
Nitrogen dioxide	200	1 hour
	40	1 year
Carbon monoxide	100000	15 minutes
	60000	30 minutes
	30000	1 hour
	10000	8 hours
Ozone	120	8 hours
Suspended particulate matter		
PM ₁₀	50	1 year
	150	24 hours
PM _{2.5}	15	1 year
	65	24 hours
Lead	0.5	1 year

Capacity

The presence of a strong environmental policy in the country provides a key starting point to bring about changes to air pollution and other types of environmental contamination. To implement the policies, however, research, laboratory settings and equipment, training facilities, and technically competent professionals are required. Currently no report describes the number and the capacity of such resources in the country. Several research institutions are engaged in environmental research, including the Ethiopian Health and Nutrition Research Institute, Ethiopian Institute of Agricultural Research, Institute of Biodiversity Conservation (Biotechnology and Bio-safety Department), Armauer Hansen Research Institute (AHRI), Harar Rural Technology Research Centre, Mekelle Appropriate Technology Research Center. There are also laboratories available at the Addis Ababa City Environmental Protection Authority Laboratory and within universities, such as the laboratory at Jimma University.

System Capacity

Strong coordination is lacking among implementers throughout the country to act synergistically on the common problems. More clarity is needed regarding the responsibilities of, and relationships among, federal agencies and regions, and among regions themselves (11). None of the agencies involved in air pollution control have a structural framework that reaches the lower administration levels or even to the regions.



Institutional Capacity

Institutional capacity building in the field of environmental protection is urgently needed. In particular, institutions at the regional level do not have trained/skilled manpower or adequate financial resources to realize their environmental obligations (6, 11). The comprehensive environmental legislation currently in place involves complex and multi-sectoral issues and requires efficient institutional mechanisms to support its implementation (6, 11). Except for one laboratory and the few instruments in the Addis Ababa regional Environmental Protection Authority, there are no research institutions and laboratory set-ups for measuring air pollution levels and other environmental contaminants. Lack of funding is the other major capacity limitation faced by the institutions, constraining their ability to effectively measure and control air pollution.

Individual Capacity

Few qualified air pollution professionals are available in Ethiopia, and the ministries responsible for air pollution control have no trained staff.

3.1.2. Climate Change and Health

Policy

Similar to air pollution, climate change is addressed in Ethiopia's environmental policy through regulations and institutional and programmatic mechanisms. Article 3/9/a of the policy document emphasizes the need for a climate monitoring program as the country is highly sensitive to climatic variability. Article 3/9/c recognizes Ethiopia's environmental, long-term economic interests, and energy interests with regard to the will and ability to minimize atmospheric inputs of greenhouse gases. For example, the energy sector is committed to harnessing hydro-, geothermal, and solar energy, none of which produce significant amounts of pollutant gases. Article 3/9/d of the policy document emphasizes the need to actively protect the ozone layer, recognizing the vulnerability of the Ethiopian highlands (which already have a thin protective atmosphere) to suffer agricultural losses and adverse health effects from additional exposure to ultraviolet rays (6).

Regulatory Framework

The federal environmental policy provides the only legal framework focused on climate change in the country. There are no strategic research plans or policy enforcement mechanisms for its implementation.

Institutional Framework

At the federal level, emphasis is given to climate change and its dynamic, cross-sectoral nature. An inter-ministerial steering committee has been established, chaired by the Prime Minister Counselor and hosted by the Natural Resource Management Department within the Ministry of Agriculture. The



committee also includes representatives from the Ministries of Health, Industry, Water and Energy, and Mines, along with the Environmental Protection Authority. The Department of Natural Resource Management also has technical teams assigned to deal with issues concerning climate change. While the federal structure has not yet extended to the regions and other lower administration levels, there are climate-related focal persons at the regional level.

In addition to the federal government, there are a number of other organizations working on climate change in the country, including Climate Change Forum Ethiopia, Farm Africa, the Norwegian Embassy, the U.K. Department for International development (DFID), the European Union, the United Nations Development Program (UNDP), and others.

Strategy

Ethiopia is already experiencing the effects of climate change, including increases in average temperature and changes in rainfall patterns. This presents the necessity -- and opportunity -- to switch to a new, sustainable development model. The Government of the FDRE has initiated the Climate-Resilient Green Economy (CRGE) initiative to protect the country from the adverse effects of climate change and to build a green economy that will help the country realize its ambition of reaching middle-income status before 2025 (12). The CRGE was developed in 2011 and launched at the 17th United Nations Framework Convention on Climate Change (UNFCCC) in Durban, in 2011 (13). It follows a multi-sectoral approach and has so far identified and prioritized more than 60 initiatives, which could help the country achieve its development goals while limiting 2030 Green House Gases (GHG) emissions to 150 Mt CO₂e – around 250 Mt CO₂e less than estimated under a conventional development path.

The government's green economy plan is based on four pillars (12):

1. Improving crop and livestock production practices to improve food security and raise farmer income while reducing emissions.
2. Protecting and re-establishing forests for economic and ecosystem benefits, including as carbon stocks.
3. Expanding electricity generation from renewable sources of energy for domestic and regional markets.
4. Leapfrogging to modern and energy-efficient technologies in transport, industry, and building design.

Implementing these initiatives would offer important co-benefits. For example, public health would improve through better air and water quality and increased soil fertility, while food security would promote rural economic development (9).

In addition to the CRGE strategy, the National Meteorology Agency (NMA) designed the National Adaptation Program of Action (NAPA), a program within the UNFCCC designed to help Least Developed Countries (LDCs), including Ethiopia, identify their priority adaptation needs and to communicate these needs to the Conference of Parties (COP) of the UNFCCC and other concerned



bodies (14). The Intergovernmental Panel on Climate Change (IPCC) identified the main country determinants of adaptive capacity as economic wealth, technology, information and skills, infrastructure, institutions, and equity. For public health, the current health status and pre-existing disease burdens must be considered (15). NAPA provides a mechanism for LDCs to seek immediate and urgent support to build these capacities and start adapting to the current and projected adverse effects of climate change (14).

Cognizant of the impact climate change can have on the health of citizens in Ethiopia, the federal Ministry of Health has also prepared a “Climate Change Adaptation Program Plan for Health, 2011-2015.” This plan provides the foundation for a systematic response across all health systems at national, regional, zone, woreda, and kebele levels (15). The following are response measures identified for the climate change adaptation program (15).

- Develop and disseminate reliable information about potential climate change impacts, vulnerabilities, adaptation options and tools, good practice examples and advantages of adaptation, potential tradeoffs, synergies and conflicts with mitigation, and existing policies to decision makers, stakeholders, and the larger public to raise their awareness.
- Initiate training for health professionals and researchers on the health effects of climate change; ensure that systems are in place to detect and track climate change induced health problems; and make the necessary preparations to respond to, and manage, climate change associated risks.
- Enhance infrastructures specifically designed to reduce vulnerability to climate variability (e.g., flood control structures, air conditioning, building insulation, and stringent building codes) and general public health infrastructures (e.g., sanitation facilities, waste water treatment, water supply systems, and laboratory buildings).
- Build capacity in education, awareness-raising, and the creation of legal frameworks, institutions and an environment that enables people to make well-informed, long-term, sustainable decisions.
- Develop a forward-looking, strong, and unifying vision of health care, as well as an understanding of the problems posed by climate change.
- Train individuals skilled at recognizing, reporting, and responding to health threats associated with climate change, as well as researchers with backgrounds in epidemiology and laboratory sciences to provide a sound basis for surveillance and response.
- Train skilled public health managers, who understand surveillance and diagnostic information, to mobilize the appropriate response.
- Train individuals in the operation, quality control, and maintenance of the public health infrastructure, including laboratory equipment, communications equipment, and sanitation, wastewater, and water supply systems.
- Develop new arrangements and collaborations among institutions to address risks effectively, thereby enhancing adaptive capacity. Nations and international organizations, such as WHO,



can cooperate in coordinating surveillance and response activities to address disease threats more effectively.

- Increase collaboration between the public and private sectors.
- Gain better knowledge of the processes of adaptation decision-making; roles and responsibilities in adaptation of individuals, communities, nations, institutions and the private sector; conditions that stimulate or act as a barrier to adaptation; and what level of certainty is needed for public health decision-makers to act.
- Conduct research on barriers and opportunities for enhancing adaptive capacity in order to protect human health.
- Focus and prioritize response measures to address the groups most vulnerable to climate change during development and execution of policies, strategies, and programs.

Guidelines

There are no guidelines or related documents available concerning climate change.

Capacity

System Capacity

The federal Environmental Protection Authority oversees the major responsibilities related to climate change, although a number of other institutions are involved. There are, however, no specific documents available that state how the various institutions should communicate and cooperate as they undertake various climate change-related actions. Based on our interviews, we found that:

- The National Meteorology Agency, for example, indicated that there is interaction or communication between the agency and the EPA, MOH, International Research Institute (IRI), insurance agencies, and the Ministry of Transportation. Previously a taskforce organized between MOH and NMA was actively engaged in activities related to climate change and health issues.
- The Water and Energy Minister collaborates with Ministries of Agriculture, Finance and Economic Development, Mines, Trade, Transportation, and Education, as well as the Ethiopian Light and Power Agency, Addis Ababa University, and the Science and Technology Institute on climate change and developmental activities. Communication and coordination at the lower administration level, however, is very poor. Consequently, there is inadequate capacity to exchange information among NMA and NAPA project staff and with implementers of the action plans.



Institutional Capacity

No ministry or institution has the capacity to translate the intervention mechanisms into practice on the ground, as there are no laboratory settings or research institutions that deal with climate change. There are, however, some older instruments that may be used to monitor meteorological events and one laboratory is set up in the Addis Ababa Regional Environmental Protection Authority. The capacity limitation is not only restricted to laboratory set-up and research institutions: financial constraints also challenge the work of implementers.

Individual Capacity

The documents reviewed and interviews conducted revealed few highly trained professionals and limited capacity associated with climate change, whether with regard to implementing intervention activities, carrying out research, or providing training. There is no qualified professional at any level of government -- federal, regional or lower administrative levels in any of the ministries -- with expertise in issues related to climate change.

3.1.3. Occupational Safety and Health (OSH)

Policy

In addition to the environmental rights granted by the FDRE Constitution noted above, Article 42/2 guarantees workers the right to a healthy and safe work environment. Under Proclamation No. 4/1995, MOLSA is given the power to determine standards and measures for the safety and health of workers and to follow up on their implementation; and to collect, compile and disseminate information on safety and health of workers (16). There is, however, no national OSH policy outlining how occupational safety and health should be handled nationally or at lower governing levels as required by the international Occupation Safety and Health and Working Environment Convention No. 155/1981, of which Ethiopia is a signatory. There are, however, other policies that have some relevance to the promotion and necessity of OSH services development (17).

The national health policy of 1993, for example, has clearly indicated principles that directly deal with OSH issues. Article 2/2 states that emphasis will be made to promote OSH in the industry and production sectors. Article 3/9 states that inter-sectoral collaboration is required to develop facilities and mechanisms for workers' health and safety in the production sectors (5, 17).

Currently an occupational safety and health policy is under consideration for approval by the House of People's Representatives that accounts for Ethiopia's obligations under international conventions and other OSH-related agreements.

Regulatory Framework



Occupational safety, health, and workplace regulations are available in two proclamations. The Food, Medicine and Health Care Administration and Control Proclamation No. 661/2009 article 23/1 states that any employer shall ensure the availability of occupational health services to his/her employees. Article 23 sub-article 2 of the same proclamation states that the executive organ shall issue appropriate directives on occupational health and use of machinery (18). Labor Proclamation No. 377/2003, under Sub-Articles 1-8 of Article 92, describes the following occupational safety, health, and working conditions (19):

An employer shall take the necessary measure to safeguard adequately the health and safety of the workers; he shall in particular:

1. Comply with the occupational health and safety requirements provided for in this Proclamation;
2. Take appropriate steps to ensure that workers are properly instructed and notified concerning the hazards of their respective occupations and the precautions necessary to avoid accident and injury to health; ensure that directives are given and also assign safety officer; establish an occupational, safety and health committee of which the committee's establishment, shall be determined by a directive issued by the Minister;
3. Provide workers with protective equipment, clothing and other materials and instruct them of its use;
4. Register employment accident and occupational diseases and notify the labor inspection of same;
5. Arrange, according to the nature of the work, at his own expense for the medical examination of newly employed workers and for those workers engaged in hazardous work, as may be necessary.
6. Ensure that the work place and premises do not cause danger to the health and safety of the workers;
7. Take appropriate pre-executions to insure that all the processes of work shall not be a source or cause of physical, chemical, biological, ergonomical and psychological hazards to the health and safety of the workers;
8. Implement the directives issued by the appropriate authority in accordance with this Proclamation.

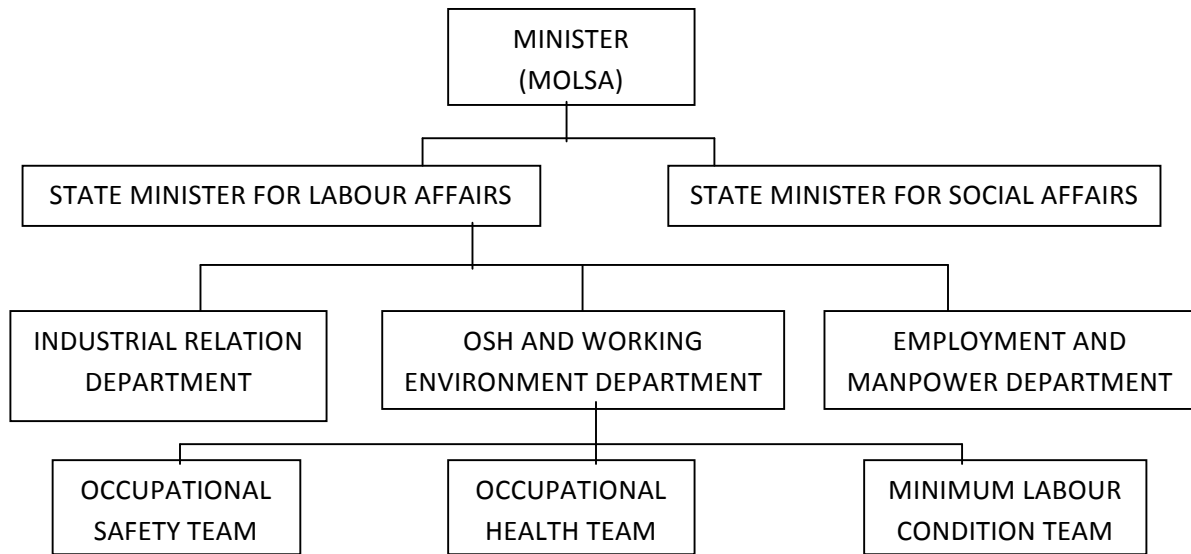
Institutional Framework

According to the provisions of existing labor laws, the Ministry of Labor and Social Affairs and its counterparts in the regional states coordinate all aspects of the labor administration system (17). The Minister provides the political and executive leadership, while the State Minister and heads of the Occupational Safety, Health and Working Environment Department, as well as employment services, provide technical leadership and oversee the appropriate implementation of the law under the scope of their responsibilities. They propose policy and legislation-related instruments, undertake studies, and monitor how the system is operating in all matters of labor administration (17).



They also cooperate directly with other corresponding centers of power in government, namely other lead agencies such as the MOH, the Ministries of Agriculture and Rural Development, Finance and Economic Development, Education, and Justice, as well as the Supreme Court, the EPA, the Radiation Protection Authority, and the Quality and Standardization Authority (17).





Source: Solomon Yimer and Chris Keil, Ethiopian Occupational Health and Safety Regulatory Environment

Figure 1: Federal level organizational structure of the Ministry of Labor and Social Affairs

Strategy

With regard to OSH, only directive documents are available, which, according to the experts interviewed, require revision to account for current developments and associated new technologies, and health outcomes.

Guidelines

There are no existing guidelines to monitor and evaluate the safety and health of the occupational environment.

Capacity

System Capacity

While there are no guidelines regarding how various sectors or ministries should communicate and share their responsibilities, MOLSA officials indicated that they co-operate directly with other corresponding centers of power within the government (17).

Institutional Capacity

Documents regarding the availability and capacity of research institutions and laboratories established to address OSH-related issues are lacking. However, from the interviews conducted, there appears to be a wide gap in the availability of research institutions, laboratory settings, logistics, and financial resources to implement the required activities.

Individual Capacity

The Ministry of Labor and Social Affairs identified the lack of experienced and skilled professionals as the most significant problem in carrying out its duties. Most of the available inspectors are generally well-trained in basic sciences, but lack specialized OSH training (16). It was also established during the interview process that university training and other training opportunities are not yet targeting their needs and therefore inspectors are not able to use the measuring instruments appropriately to carry out their monitoring and evaluation responsibilities.

3.2. Identified Gaps

Based on the reviewed documents and interviews conducted with various ministry officials, gaps, constraints, and needs are identified and described according to each ministry or sector.

National Meteorology Agency

Gaps/Constraints

- Lack of technically skilled human power/ professionals.

- High turnover of those skilled professionals, either to employment abroad or to other organizations.
- Inadequacy of cross-sectoral links among ministries and departments.
- Lack of a strong coordination mechanism at both the federal and regional levels.
- Lack of inter-office links among those federal and regional sector offices involved in the environment and development.
- Lack of awareness regarding the concepts and advantages of related meteorological issues.
- Absence of well-organized research institutions involved with climate change adaptation and associated possible outcomes.
- Lack of efficient outreach mechanisms on the environment to local communities.

Ministry of Health

Gaps/Constraints:

- No clear understanding by the relevant groups of the difference between environmental health and environmental protection.
- Lack of coordination with assigning professionals to the appropriate environmental health activities; for example, pharmacists are currently recruited for the inspection of food and drinking establishments.
- Lack of political commitment to a strong department of environmental health; consequently, no department is responsible in the FMOH and the Addis Ababa City Administration. Within the ministry, attention to air pollution and climate change is deficient.
- No clear job descriptions, as the organizational structure of the department is already combined with other units or directorates.

Environmental Protection Authority

Gaps/Constraints:

- Capacity issues -- both human power and facilities -- present challenges at regional and lower levels.
- Moving down from the regional levels, environmental protection activities are carried out by various implementers, resulting in lack of clarity regarding responsibilities and leading to less emphasis on critical issues.
- There is an absence of indicators and standards.
- Lack of awareness and less attention to climate change issues is a problem at lower administrative levels.
- There has been no intensive research and monitoring on the status and trends of pollution in Ethiopia's major cities, including Addis Ababa.
- No local research has been carried out regarding climate change issues.



Ministry of Agriculture

Gaps/Constraints:

- Lack of awareness about climate change.
- Resource scarcity (logistics and financial) to carry out various interventions on climate change.
- Gaps in technology, including knowing what type of technology is required for the current conditions associated with climate change and the technical skills to choose and apply the knowledge.
- Poor inter-sectoral collaboration to address the complex nature of climate change.
- Absence of monitoring, reporting, and verification (MRV) mechanisms.
- Lack of integration with research institutions, as the research centers emphasize production but still need to incorporate climate change and related issues in their routine activities.
- Lack of opportunities to inform and share climate change information at conferences, meetings, symposiums, and else GEOHealth
- A scarcity of human resources at both the qualitative and quantitative levels, to deal with adaptation and mitigation as they relate to climate change.
- Lack of research carried out on climate change and related issues.

Ministry of Water Resources and Energy

Gaps/Constraints:

- Lack of skilled and experienced professionals.
- No baseline data or information on the amount of CO₂ released or discharged into the environment by various industries or factories.
- No research centers that conduct studies to evaluate different adaptation and mitigation activities.
- No indicators to determine carbon emission reduction.
- No indicators to determine the effectiveness of the intervention on efficient stove distribution and improved housing conditions, and its associated health improvements.
- Financial and logistic scarcities.

Ministry of Labor and Social Affairs

Gaps/Constraints:

- Lack of appropriately skilled professionals.
- Absence of monitoring and evaluation tools and therefore an absence of consistency and scientific rigor.



- Lack of training for professionals on the use and maintenance of the few available instruments.
- Overlap of responsibilities in some areas, as the advisory and inspection activities are carried out by the same individual.
- Lack of evaluation procedures even in circumstances governed by a current regulation.
- No systems for pre-employment health evaluations or occupational disease identification.
- Training gaps, as training at both university level courses and short-term instruction given by different agents are not need-based.
- Research gaps, as no relevant studies have been conducted on those sectors needing special attention, including the horticulture, mining, textile, and construction. Health hazards that could result from new construction associated with development should also be investigated.
- No evidence-based information regarding costs of health problems that result from work and work environments.
- Absence of an accident and emergency registration system or reporting mechanism.

3.3. Needs assessment

3.3.1. Identified Needs

National Meteorology Agency

Needs:

The following needs are fundamental to the mission of the NMA.

- There should be effective interaction between universities and NMA for research and training activities.
- There must be practice-based training at the universities so that their graduates acquire the required skills.
- There should be a mechanism to assist in retaining those professionals who might otherwise leave their employment and possibly Ethiopia.
- There is a need for establishing a national center for climate change adaptation and other associated factors.
- The training curriculum should include meteorological and climate concepts, with related basic education at the primary, secondary, and tertiary levels of the teaching sectors.
- Teachers with knowledge and training in meteorology and climate studies are needed at all educational levels.
- There is a need for NMA to avail itself of advanced technologies to measure air pollutants in the atmosphere and monitor meteorological events.

Ministry of Health



Needs:

- Establish a self-sufficient environmental health authority or agency to run the activities accordingly.
- Establish an organizational framework for environmental health that runs from the federal to the woreda levels.
- Assign duties, accountability, and responsibility to the ideal environmental health professionals.
- Provide research and training opportunities on data quality, program evaluation, and cause identification related to environmental health conditions.



Environmental Protection Authority

Needs:

- Establish certified external environmental auditing centers or consultancy institutions.
- Establish air pollution monitoring stations at various sites in Ethiopia's cities.
- Establish laboratories in different regions of the country.
- Conduct research that shows the status and trends of air pollution in Addis Ababa.
- Conduct research on control mechanisms and interventions.
- Conduct research on climate change and its associated health problems.
- Train professionals on issues relating to air pollution and to climate change.
- Create awareness in the communities about the hazards of burning of plastic waste and rubber.

Ministry of Agriculture

Needs:

- Create awareness of climate change and its associated outcomes at all levels.
- Build the capacity of the ministry in the areas of facilities and technological provision.
- Provide financial and logistic support.
- Conduct research on climate change and its related possible outcomes.
- Train professionals about climate change, adaptation, and mitigation.
- Provide efficient machines for energy production.

Ministry of Water Resources and Energy

Needs:

- Recruit knowledgeable, skilled, and experienced professionals.
- Provide various training opportunities on air pollution and climate change issues, at both the basic knowledge and technical capacity levels.
- Conduct baseline research, as baseline information on air pollution and climate change is lacking.
- Formulate indicators to measure change and achievement of interventions.
- Evaluate the impact of interventions to improve public health issues.

Ministry of Labor and Social Affairs



Needs:

- Improve the capacity of professionals by providing need-based training.
- Conduct need-assessment research to target need-based training.
- Conduct research at different institutions to evaluate the health conditions of the workers.
- Conduct baseline research on newly constructed developmental projects.
- Conduct research to evaluate the economic burden of health problems that result from poor work environments.
- Assign different professionals to advisory and inspection duties.
- Organize systems to evaluate pre-employment health conditions of workers and to identify occupational diseases by collaborating with ministry of health.
- Organize a country-wide registration system for work-related accidents and emergencies.

4. Priority Gaps

- There is a shortage of skilled human resources at all levels, including a lack of those with specific skills to operate equipment and manage problems related to occupational health and safety, climate change, and air pollution.
- There is a lack of evidence and research activities related to air pollution, climate change, and occupational health. Data are limited in all three areas. In the context of Ethiopia's growing industrialization, no baseline data or surveillance systems, other than a few studies of particular factories, are available.
- Coordination and integration among the different stakeholders is poor. The structure and the regulation between different ministries exist, but the implementation has been minimal at best.
- There is minimal awareness among the public, implementers, and decision makers of contemporary problems such as the health impacts of climate change, air pollution, and occupational and workplace hazards.
- Poor monitoring and documentation of activities persist. Documents and data are not available in most organizations, and monitoring and evaluation activities are limited.
- There is inadequate linkage between training institutions and skills required by the ministries. No forums are available for engaging universities and the different stakeholders in curriculum design and joint research activities.
- There is no budget allocated or facilities designated for laboratories, research, or surveillance.

5. Priority Needs for Intervention

Identified Needs

- Training professionals (both undergraduate and graduate) should be prioritized at the national level for instruction on occupational health, climate change, and air pollution.



- Align training curricula with the country's needs. The universities and stakeholder ministries should design need-based curricula together.
- Generate evidence and establish research and surveillance sites and control stations in various sites in Addis Ababa to monitor particulate matter, emitted gases, and other pollutants. Encourage industries/factories to establish their own stations and to document and report their findings to the concerned ministries.
- Increase awareness of the public and of decision makers regarding climate change, air pollution, and occupational health, and improve documentation of the related activities
- Set indicators for monitoring and evaluating climate change and occupational health and safety, and establish systems to implement policies and regulations.
- Establish mechanisms of accountability and systems of coordination at national and organizational levels.

6. Conclusions

Results of the situational analysis and needs assessment of the policies, regulations, and regulatory framework show a number of major common constraints in addressing air pollution, occupational health and safety, and climate change and health.

While many policies and regulatory provisions are already on paper, there is a lack of persistence in implementing the policies/strategies and effecting the regulatory provisions. Observation points to the lack of linkage among the various institutions charged with addressing the complexity of the problems and needs related to health, development, and the environment.

The results of the situational analysis indicate that there are cross-cutting gaps in the various sectors. Among these, shortage of skilled personnel is an urgent priority. Most of the stakeholders suffer from acute shortages of professionals and poor retention mechanisms.

Research activities to date in air pollution, occupational health, and climate change as related to health are minimal. Consequently, evidence based decision-making and monitoring and evaluation are hampered.

Each of the four themes in the SANA is defined by its complexity and multi-sectoral nature; however, mechanisms for coordination and integration are mostly on paper and nonfunctioning in reality. Lack of such mechanisms reduces the engagement of the different stakeholders mandated by the government.

The linkage between universities and concerned ministries indicates a mismatch between what the training institutions are producing and the specific skills required by the ministries, along with poor awareness among many sectors of the related challenges. Furthermore, poor documentation compounds minimal monitoring and evaluation activities.

Based on the findings of the situational analysis and needs assessment, the following are underscored:



- To design interventions focusing on capacity building, such as aligning curricula with specific needs of ministries and equipping professionals with the necessary technical skills.
- To build research capacity to improve evidence-based decision-making and enhance surveillance systems for monitoring and evaluation.
- To clarify implementation guidelines, procedures of accountability, and coordination mechanisms as required by existing policies and regulations.
- To develop mechanisms for raising awareness in the respective sectors, including policymakers and the public at large.



7. Strengths and Limitations

Strengths

This is the first attempt to address the macro level conditions of policies, regulations, and organizational frameworks for identifying gaps and needs at national level. The use of the SANA approach has helped in preparing the tools for future evaluations. It represents an international collaboration involving many national stakeholders, key professionals, and acclaimed researchers.

Limitations

Given the lack of related information available, regional governments were not addressed in the needs assessment.



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9. Annexes

Annex 1: Key informant Background for GEOHealth hub SANA interview

Name of organization	Name of informant	Position of key informant	Phone number	Remarks
MOH	Mebiratu	Monitoring and Evaluation Officer	0913070097	
MOH	Dagne Taddesse	Monitoring and Evaluation Officer	0911389541	
MOH	Chanie			
EPA	Mehari Wondmagegne	Monitoring and Evaluation Directorate Director	0911689132	
EPA	Dereje Agonafir	Environmental Units Program Directorate Director	0911416684-M 0116476499-O	
MOA	Sertse Sibuh	CRDE coordinator	0912734713	
WAEM	Alemayehu Tafesse	EIA and Social development Officer	0911413311	
WAEM	Sahile Tamiru	Energy Study and Development Follow up Directorate	0912425094	
NMA	Tesfaye Gissila	Meteorological research and Study Directorate Director	0911071486	
MOLSA	Fekade G/Michael		0911894373	
MOLSA	Mesfin Yilma		0911611884	
MOLSA	Fitsum G/Michael		0911916125	
PHEM	Abel Yeshaneh	Public Relation Officer	0911453054	



Annex 2: Proclamations that have relation with environmental protection and environmental health

No	Proclamation/Regulation No and Date	Title	Sources
1	Proc. No. 9/1995	Proclamation to Provide for the Establishment of the Environmental Protection Authority	Federal Negarit Gazeta Of the Federal Democratic Republic of Ethiopia, 1 st Year No.9 Addis Ababa-24 th August, 1995.
2	Proc. No. 295/2002	Environmental Protection Organs Establishment Proclamation	Federal Negarit Gazeta Of the Federal Democratic Republic of Ethiopia, 9 th Year No.7 Addis Ababa-3 rd October, 2002.
3	Proc. No. 299/2002	Environmental Impact Assessment Proclamation	Federal Negarit Gazeta Of the Federal Democratic Republic of Ethiopia, 9 th Year No. 11 Addis Ababa 3 rd December, 2002
4	Proc. No. 300/2002	Environmental Pollution Control Proclamation	Federal Negarit Gazeta Of the Federal Democratic Republic of Ethiopia, 9 th Year No. 12 Addis Ababa3 rd December,2002
5	Proc. No. 655/2009	Biosafety Proclamation	Federal Negarit Gazeta Of the Federal Democratic Republic of Ethiopia, 1 st Year No. 63 Addis Ababa 9 th September,2009
6	Reg. No. 159/2008	Prevention of Industrial Pollution Council of Ministers Regulation	Federal Negarit Gazeta Of the Federal Democratic Republic of Ethiopia, 15 th Year No. 14 Addis Ababa 7 th January,2009
7	Proc. No. 200/2000	Public Health Proclamation	Federal Negarit Gazeta Of the Federal Democratic Republic of Ethiopia, 6 th Year No. 28 Addis Ababa 9 th March, 2000
8	Proc. No. 661/2009	Food, Medicine, Health Care Administration and Control Proclamation	Federal Negarit Gazeta Of the Federal Democratic Republic of Ethiopia, 16 th Year No. 9 Addis Ababa 13 th January, 2010
9	Proc. No. 377/2003	Labor Proclamation	Federal Negarit Gazeta Of the Federal Democratic Republic of Ethiopia, 10 th Year No. 12 Addis Ababa 26 th February 2004
10	Proc. No. 575-2008	Ethiopian Wildlife Development and	Federal Negarit Gazeta Of the Federal Democratic Republic of Ethiopia, 14 th Year No 31. Addis Ababa 22 nd May, 2008

		Conservation Authority Establishment	
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Annex 3: Guidelines for Air Quality: Compounds with Non-Carcinogenic Health Endpoints (7)

Compound	Guideline Value (GV) or Tolerance Concentration (TC)	Averaging Time
	$\mu\text{g}/\text{m}^3$	
Acetaldehyde	2 000 (TC)	24 hours
	50 (TC)	1 year
Acrolein	50 (GV)	30 min
Acrylic acid	54 (GV)	1 year
2-Butoxyethanol	13100 (TC)	1 week
Cadmium	5×10^{-3} (GV)	1 year
Carbon disulphide	100 (GV)	24 hours
	20 (GV) odour annoyance	30 min
Carbon Tetrachloride	6.1 (TC)	1 year
1,4 Dichlorobenzene	1000 (TC)	1 year
Dichloromethane	3000 (GV)	24 hours
Diesel exhaust	5.6 (GV)	1 year
Ethylbenzene	22 000 (GV)	1 year
Fluorides	1 (GV)	1 year
Formaldehyde	100 (GV)	30 min
Hydrogen sulphide	150 (GV)	24 hrs
	7 (GV) Odour annoyance	30 min
Manganese	0.15 (GV)	1 year
Mercury, inorganic	1 (GV)	1 year
Methyl Methacrylate	200 (TC)	1 year
Monochlorobenzene	500 (TC)	1 year
Styrene	260 (GV)	1 week
	7 (GV) Odour annoyance	30 minutes
Tetrachloroethylene	250 (GV)	24 hours
	8000 (GV) Odour annoyance	30 minutes
Toluene	260 (GV)	1 week
	1000 (GV) Odour annoyance	30 minutes
1,3,5 Trichlorobenzene	200 (TC)	1 year
1,2,4 Trichlorobenzene	50 (TC)	1 year
Vanadium	1 (GV)	24 hours
Xylenes	4800 (GV)	24 hours
	870 (GV)	1 year

Annex 4: Guideline for Air Pollutants with Carcinogenic Health Endpoints (7)

Compound	Average ambient air concentration $\mu\text{g}/\text{m}^3$	Health endpoint	Unit risk $[\mu\text{g}/\text{m}^3]^{-1}$	class
Acetaldehyde	5	Nasal tumours in rats	$(1.5-9) \times 10^{-7}$	
Acrylonitrile	0.01-10	Lung cancer in workers	2×10^{-5}	
Arsenic	$(1-30) \times 10^{-3}$	Lung cancer in exposed humans	1.5×10^{-3}	
Benzene	5.0-20.0	Leukaemia in exposed workers	$(4.4-7.5) \times 10^{-6}$	
Benzo[a]pyrene		Lung cancer in humans	8.7×10^{-2}	
Bis(chloromethyl)ether	No data	Epitheliomas in rats	8.3×10^{-3}	
Chloroform	0.3-10	Kidney tumours in rats	4.2×10^{-7}	
Chromium VI	$(5-200) \times 10^{-3}$	Lung cancer in exposed workers	$(1.1-13) \times 10^{-2}$	
1,2-Dichloroethane	0.07-4	Tumour formation in rodents	$(0.5-2.8) \times 10^{-6}$	
Diesel exhaust	1.0-10.0	Lung cancer in rats	$(1.6-7.1) \times 10^{-5}$	
ETS	1-10	Lung cancer in exposed humans	10^{-3}	
Nickel	1-180	Lung cancer in exposed humans	3.8×10^{-4}	
PAH (BaP)	$(1-10) \times 10^{-3}$	Lung cancer in exposed humans	8.7×10^{-2}	
1,1,2,2-Tetrachloroethane	0.1-0.7	Hepatocellular carcinomas in mice	$(0.6-3.0) \times 10^{-6}$	
Trichloroethylene	1-10	Cell tumours in testes of rats	4.3×10^{-7}	
Vinylchloride	0.1-10	Hemangiosarkoma in exposed workers. Liver cancer in exposed workers	1×10^{-6}	

Overall conclusions

The FOUR core sections shared same and consistent findings. The sectoral areas of GEOHealth, which includes air pollution, occupational health and safety, and climate change faced the following gaps and challenges

1. Organizational gaps: the capacity to accommodate adequate number and type of professionals
2. Research capacity: the ability of running independently researches
3. Training gaps: the present health professionals and experts do not fit to manage environmental exposure assessment
4. Limited capacity: this is in terms of accessing and using equipment and laboratory settings needed for environmental exposure assessment
5. Policy and regulatory gaps: although this is not as serious as the above ones, there is a need to have updated policy on OSH.
6. Monitoring and Evaluation gaps: there is limited and institutionalized monitoring of key indicators in the field of GEOHealth themes. Such key issues include ambient air monitoring, monitoring the level of hazards in occupational settings, and injury among industrial workers